CAPITAL ADEQUACY AND RETURN ON EQUITY OF DEPOSIT MONEY BANKS IN NIGERIA: AN EMPIRICAL ANALYSIS

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ABSTRACT

This study investigates the effect of capital adequacy on bank stability in Nigeria, with a particular focus on its impact on return on equity (ROE). Using secondary data from Nigerian deposit money banks over the period from 2010 to 2022, the study employs panel data regression analysis to examine the relationships between capital adequacy, liquidity management, cost-income ratio, bank size, and macroeconomic factors such as asset quality, interest rates, inflation and exchange rates. The findings reveal that capital adequacy (CAR), liquidity management (LM), cost-income ratio (CIR), and bank size (LBSZ) positively influence ROE, indicating their significant role in enhancing bank stability. Conversely, asset quality, interest rates, inflation, and exchange rates have a negative effect on ROE, highlighting the challenges posed by external factors on bank performance. The study further shows that capital adequacy significantly explains variations in ROE, with other variables such as interest rates and bank size exhibiting limited impact. The findings suggest that capital adequacy plays a critical role in strengthening the stability of Nigerian banks, and policy recommendations are made to improve regulatory capital requirements, liquidity management, and asset quality, while also addressing macroeconomic challenges. These findings provide important insights for regulators, policymakers, and financial institutions in fostering a stable banking sector in Nigeria.

Keywords: *Capital Adequacy, Bank Stability, Return on Equity (ROE), Liquidity Management, Macroeconomic Factors*

INTRODUCTION

Capital adequacy remains a cornerstone of sound banking operations, as it reflects a bank's capacity to absorb losses, manage risk exposures, and sustain profitable activities. Adequate capitalization strengthens depositor and investor confidence, supports credit creation, and enhances banks' ability to contribute meaningfully to economic development. In the banking literature, capital adequacy is widely recognized as a critical determinant of financial performance,

particularly in environments characterized by macroeconomic uncertainty and heightened risk exposure (Ruggah et al., 2024).

The banking sector plays a pivotal role in economic growth through its financial intermediation function, which facilitates the mobilization of savings and the efficient allocation of credit between surplus and deficit units of the economy. By channeling financial resources to productive investments, banks promote capital formation and economic expansion (Kinini, Kariuki & Ocharo, 2024). Harley et al. (2018) note that banking activities influence virtually all sectors of the economy, as banks act as custodians of funds and primary suppliers of credit. Deposit Money Banks (DMBs) therefore constitute the main conduit through which financial resources are mobilized and allocated within an economy (Marota, 2024; Olowofela, Donfack & Soh, 2025). Given this central role, maintaining adequate capital has remained a major focus of banking regulation and reform worldwide.

Despite extensive regulatory oversight, banking systems in developing economies continue to experience episodes of financial distress and weak performance. In Nigeria, recurring concerns over bank failures and underperformance have raised questions regarding the effectiveness of capital regulation in improving banks' financial outcomes. Prior to the 2005 banking consolidation exercise, the Nigerian banking sector was characterized by a proliferation of weakly capitalized banks that lacked the capacity to effectively finance the real sector of the economy, thereby constraining economic growth (Abba, Zachariah & Inyang, 2013). Although subsequent reforms sought to strengthen banks' capital bases, uncertainty persists as to whether increased capital requirements translate into improved financial performance for deposit money banks.

Empirical evidence on the relationship between capital adequacy and bank performance remains mixed, particularly in emerging and developing economies. While some studies argue that higher capital buffers enhance profitability by reducing risk exposure and strengthening investor confidence (Odinaka, Ogochukwu & Chinedu, 2024; Takon et al., 2021), other scholars contend that excessively stringent capital requirements may constrain lending activities and adversely affect profitability, especially in environments where access to capital is limited (Ikue et al., 2022; Ofeimun & Akpotor, 2020). These conflicting findings highlight the absence of consensus in the literature and underscore the need for further empirical investigation into the performance implications of capital adequacy.

At the international level, regulatory efforts to strengthen banking systems have been guided by the Basel frameworks. Basel I introduced minimum capital requirements to address credit risk, Basel II expanded the regulatory scope to include market and operational risks, while Basel III, introduced after the global financial crisis, emphasized higher-quality capital and stronger liquidity buffers to enhance banks' resilience (Basel Committee on Banking Supervision, 2021c). Although these frameworks have contributed to improved banking performance in developed economies, their effectiveness in developing countries such as Nigeria remains subject to debate due to institutional weaknesses and underdeveloped financial markets (Mala & Jumono, 2025).

In Nigeria, recent macroeconomic pressures, including exchange rate volatility and external shocks, have renewed regulatory attention on bank capitalization. In March 2024, the Central Bank of Nigeria introduced a new recapitalization programme, raising the minimum capital requirement to ₦500 billion for commercial banks with international licenses and ₦200 billion for those with national licenses (CBN, 2024). Despite these measures, deposit money banks continue to face liquidity pressures and performance challenges, raising important questions about the extent to which capital adequacy improves profitability from the shareholders' perspective. Consequently, this study empirically examines the impact of capital adequacy on the financial performance of deposit money banks in Nigeria, using Return on Equity (ROE) as the key performance indicator. By doing so, the study seeks to contribute to the existing literature and provide evidence that can inform regulatory policy and managerial decision-making in Nigeria's banking sector.

Literature review

Theoretical Underpinning

The theory of Capital structure, as offered by Modigliani and Miller (1958), guides this study because it argues that in a perfect market, the capital structure of the firm in terms of debt and equity does not affect the total value of the firm. The theory is however based on perfect conditions that do not exist in the real world financial environment which includes, no tax, no transaction costs and no bankruptcy risks. In reality, the decision to finance a firm is affected by tax shields on debt, bankruptcy expenses, and market frictions, particularly in the banking industry (Modigliani & Miller, 1958). In Nigeria, the capital adequacy rules, including those of the Basel Accords, are vital in establishing that banks have adequate capital buffers to absorb any loss and remain stable (Hossain et al., 2019). Although the framework developed by Modigliani and Miller implies that financing decisions have no impact on the value of a firm, the regulatory framework in Nigeria ties capital structure to stability of the bank. Thus, this paper expands the Capital Structure Theory with real-world considerations, including regulatory capital requirements, taxes, and bankruptcy risks, to evaluate their effects on the stability and long-term performance of financial institutions in Nigeria (Boubakri & Guedhami, 2019).

Empirical Review

Lusmeida and Gunawan (2025) analyzed how capital adequacy can help Indonesian banks to overcome financial distress in terms of risk management factors, such as credit, operational, liquidity and market risks, between 2015 and 2022. Through logistic regression analysis in Stata 17.0 and purposive sampling, the study revealed that credit risk did not influence financial hardship but operational risk, liquidity risk, and market risk had a significant influence. Significantly, the capital adequacy ratio (CAR) was seen to curb the negative impact of liquidity and market risks on financial problems and curtail positive impact of operational and credit risks, which shows the significance of capital adequacy in the management of bank stability. Similarly, Ashwath and Sachindra (2025) evaluated the viability of a number of Indian banks in the period between 2019 and 2024 in terms of the Capital Adequacy Ratio (CAR) and Debt-Equity Ratio (DER) as the main stability indicators. The analysis used descriptive statistics and ANOVA with Bonferonni post hoc

tests, which showed that the CAR and its variability were stable and low in the case of private banks, Kotak Mahindra and HDFC Bank, which showed financial robustness. On the other hand, the CAR of the public sector banks such as Union Bank and State Bank of India (SBI) was lower and was more volatile indicating higher exposure to risk. The research found that there was general stability within the banking sector, though there was a need to have better management of debt in the more variable performing banks. Mulyani, Oktaviani and Fauziyah (2025) investigated the influence of CAR, NPL, LDR, and Firm Size on the profitability of the Indonesian banks during 2019-2023. The results, as determined by multiple linear regression analysis, indicated that CAR and firm size had no significant effect on profitability whereas NPL and LDR significantly affected profitability. This paper states that CAR contributes to the stability of banks but its direct influence on profitability might be less significant than the other factors such as NPL and LDR.

Ugorji, Nduokafor and Okolie (2025) studied how credit risk management affects the stability of the deposit money banks in Nigeria between 2015 and 2022. The purpose of the study was to find out the effects of loans and advances, non-performing loans (NPLs) and interest rates on the stability of banks. The study used an ex-post-facto design and panel least squares in the data analysis and found that NPLs had a statistically significant negative relationship with bank stability, whereas loans and advances and interest rates had a negative relationship that was not statistically significant. The paper has concluded that credit risk management is very important in improving the stability of commercial banks in Nigeria. On the same note, Olawale (2024) has studied the impact of capital adequacy on the performance of Nigerian deposit money banks between 2000 and 2020. The study, employing an ex-post-facto design and using the audited financial statements, established that capital adequacy levels such as total capital to risk-weighted assets, capitalization to total credits and debt to equity ratio had significant impact on the return on assets of banks. The results indicated direct and inverse correlations between these capital adequacy ratios and performance implying that capital adequacy is a significant factor in enhancing the performance of Nigerian banks.

Similarly, Aniemeke (2024) examined the factors that influence the stability of the banks in Nigeria between 2000 and 2021. The study employed the ZSCORE as an indicator of stability with variables including regulatory capital ratio, cost-to-income, non-performing loans, loan-to-deposit ratio, bank concentration, and the share of domestic private credit to GDP. The results indicated that the regulatory capital ratio, cost-to-income ratio, and non-performing loans were negative influences on the stability of banks, whereas loan-to-deposit ratio and bank concentration had a positive impact on bank stability in Nigeria, thus confirming that capital adequacy is a key factor that determines the stability of banks in Nigeria.

On the same note, Ihejirika and Ojiegbe (2024) examined the influence of capital adequacy on the return on equity (ROE) of the deposit money banks in Nigeria between the years 2004 and 2022. Through the quasi-experimental design and data analysis with ADF unit root tests, Granger causality, and ARDL models, the study revealed that total qualifying capital and adjusted shareholders fund and the capital to risk-weighted assets ratio had significant effect on ROE. The findings stressed on the significance of capital adequacy in improving the financial performance of Nigerian banks.

Conversely, Ezu, Nwanna, and Eke-Jeff (2023) examined the influence of capital adequacy on the performance of the Nigerian deposit money banks between 2000 and 2020. The study was ex-post-facto which used ordinary least square (OLS) regression and secondary data based on financial statements. Their conclusion was that capital adequacy especially in terms of total capital to risk weighted assets had direct and inverse relationship with the return on assets. The research suggested that the Central Bank of Nigeria should change the capital base requirement to adjust to the current situation in the banking industry to enhance stability and performance of the banks.

In addition, Oseni (2024) evaluated the viability of the Nigerian deposit money banks between 2013 and 2022 based on both the ordinary least square (OLS) and the IMF bankometer model. According to the study, most of the banks had scores above the IMF minimum score meaning that the banking sector was healthy. There was, however, one bank in distress. The article recommended active regulation oversight to warrant the continued health of banks.

Besides, Ikpesu and Oke (2022) used the system generalized method of moments (SGMM) to examine the data of 12 banks listed on the Nigerian Stock Exchange between 2010 and 2019. They established that capital adequacy and asset quality were positively related to bank performance, indicating that adequate capital and quality assets play a very important role in determining the profitability of banks in Nigeria.

In a similar manner, Andersen and Juelsru (2024) examined the optimum capital adequacy ratio of banks in terms of socio-economics. In their report, they concluded that a CET1 ratio of 12-19 percent would be financially stable and cost effective in terms of lending. This observation reinforces the rationale behind the need to have regulatory frameworks in place that can provide sufficient capital buffers within the banking sector to prevent costly crisis.

Widyatmoko and Risman (2024) examined how digital finance, capital adequacy, efficiency, and asset quality affected the profitability, with the moderation of foreign ownership. Their research found out that capital adequacy and asset quality have a great impact on profitability, whereas foreign ownership moderated the relationship between mobile banking and the return on assets, but did not moderate the relationship between capital adequacy, operating costs and non-performing loans.

In a similar manner, Ghayad and Noura (2022) examined how capital adequacy requirements impacted the financial stability of Lebanese banks in the period between 2009 and 2018. In their analysis using simple linear regression, they concluded that except one bank, the capital adequacy ratio (CAR) did not have any significant effect on the stability of Lebanese banks. This finding was especially important in light of the 2019 financial meltdown, which demonstrated that regulatory mechanisms had been inadequate at disallowing liquidity crises, necessitating the introduction of stricter capital adequacy regulation in the banking sector of Lebanon.

Methodology

This study adopted an ex post facto research design as it relied on historical (secondary) data, which is appropriate for investigating the effect of capital adequacy on bank stability in Nigeria. The ex post facto design is used because it allows for the examination of relationships between variables that have already occurred and cannot be manipulated (Trochim, 2006). In the context of this study, the independent variables (such as capital adequacy, asset quality, liquidity management, and cost-income ratio) and the dependent variable (bank stability) are historical data derived from the annual reports of banks from 2014 to 2023. This design enables the researcher to analyze the effects of capital adequacy on stability without any experimental manipulation.

Population of the Study

The population for this study comprised all the deposit money banks in Nigeria. These banks were chosen because they are required to comply with the regulatory frameworks set by the Central Bank of Nigeria (CBN), making them ideal candidates for the study. The stability and performance of these banks are also representative of the Nigerian banking sector as a whole. The selected banks provide an extensive and reliable data set, which is crucial for analyzing trends and relationships over a period of time.

Sample Size and Sampling Technique

This study adopted all the 11 listed deposit money banks in Nigeria with national and international authorization which are First Bank, UBA, GTB, Access Zenith Bank, Fidelity Bank, Ecobank, Sterling Bank, Wema Bank, FCMB, and Stanbic Bank. The selection was based on factors such as asset size, market share, and regulatory significance to ensure that systemically important banks were adequately represented. This approach enhances the study's ability to analyze capital adequacy and stability in banks that significantly influence Nigeria's financial system. The study focused on the period from 2014 to 2023, providing a comprehensive view of trends in capital adequacy and banking stability.

Model Specification

Following the work of Ezu, Nwanna, and Eke-Jeff (2023, the model is below is adapted for the purpose of this study.

$$ROE_{it} = F\ (CAR_{it}, AQ_{it}, LM_{it}, CIR_{it}, BSZ_{it}, IR_{it}, INF_{it}, ER_{it}) \qquad (3.1)$$

Where:
ROE$_{it}$ = Return on Equity for bank i at time t
CAR$_{it}$ = Capital Adequacy Ratio for bank i at time t
AQ$_{it}$= Asset Quality for bank i at time t
LM$_{it}$ = Liquidity Management for bank i at time t
CIR$_{it}$ = Cost-Income Ratio for bank i at time t

BSZ$_{it}$ = Bank Size for bank i at time t
IR$_{it}$= Interest Rate for bank i at time t
INF$_{it}$ = Inflation Rate for bank i at time t
ER$_{it}$ = Exchange Rate for bank i at time t

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 AQ_{it} + \beta_3 LM_{it} + \beta_4 CIR_{it} + \beta_5 BSZ_{it} + \beta_6 IR_{it} + \beta_7 INF_{it} + \beta_8 ER_{it} + \epsilon_{it} \quad (3.2)$$

Where
β_0 = Regression Intercept

β_1- β_9 = Regression Coefficients
ϵ_{it} = error term

Variable Description and Measurement

Table 1 Dependent Variable: Financial Stability (BS)

Variable	**Acronym**	**Description**	**Measurement**
Return on Equity	ROE	Measures profitability relative to equity.	Net Income/Shareholder's Equity

Source: *Author's Computations (2025)*

Table 2 Independent Variables and Control Variables:

Variable	Acronym	Description	Measurement	Type
Capital Adequacy Ratio	CAR	Measures capital as a percentage of risk-weighted assets.	(Tier 1 Capital+Tier 2 Capital) /Risk	Independent
Asset Quality	AQ	Reflects the riskiness of the bank's assets.	Non-Performing Loans/Total Loans	Independent
Liquidity Management	LM	Measures the bank's ability to meet short-term obligations.	Liquid Assets/Total Assets	Independent
Cost-Income Ratio	CIR	Measures operational efficiency.	Total Operating Costs/Total O perating Income	Independent
Bank Size	BSZ	Measures the scale of the bank.	log(Total Assets)	Control
Interest Rate	IR	Reflects the market interest rate, typically the Central Bank's benchmark rate.	Market interest rate (Central Bank of Nigeria's rate)	Control
Inflation Rate	INF	Measures the annual inflation rate in the economy.	National inflation rate (as reported by the National Bureau of Statistics)	Control

Exchange Rate	ER	Represents the exchange rate between the Nigerian Naira (NGN) and the US Dollar (USD).	Exchange rate (NGN/USD)	Control

Source: *Author's Computations (2025)*

This analysis employed panel regression analysis to investigate the relationship between independent variables and the stability of banks in Nigeria using time series and cross-sectional data in order to gain a further insight into the relationship between these variables. Two models have been used, the Fixed Effects Model (FEM) and the Random Effects Model (REM). The FEM allows time-invariant heterogeneity among banks which assumes that banks have individual, constant parameters that may affect bank stability. In contrast, the REM supposes that unmeasured effects are random and uncorrelated with the explanatory variables, so it is more efficient when the variation across banks is random. The Hausman test was used to test which model was more suitable where FEM was favored in cases where heterogeneity is correlated with the explanatory variables and REM in cases where there is no correlation. A Pooled OLS was also employed as a robustness check to make sure about the reliability of the results.

Result and Discussion

Table 3: Descriptive Statistics of Variables

	ROE	CAR	AQ	LM	CIR	LBSZ	INT	INFR	EXR
Mean	14.15769	18.71636	2.64E+08	42.06679	66.62173	13.18664	13.67500	14.64531	317.1704
Median	13.20093	18.17500	14232500	41.37000	65.10000	13.88998	13.75000	14.47142	306.5023
Maximum	36.53405	32.60000	2.72E+09	76.00000	94.00000	21.52977	18.75000	24.65955	462.4824
Minimum	0.475270	1.930000	9.00E-10	13.00000	29.10000	6.439747	11.00000	8.047411	158.5526
Std. Dev.	7.910902	4.433717	5.00E+08	14.09476	15.24618	5.404350	2.323728	4.734654	93.63137
Skewness	0.546627	-0.113330	3.259058	0.305667	-0.304793	0.138392	0.880148	0.552541	-0.144785
Kurtosis	2.667502	4.255332	14.93840	2.841517	2.355193	1.464058	2.902315	2.730261	2.027814
Jarque-Bera	5.984724	7.458151	847.9677	1.828048	3.608786	11.16375	14.24584	5.930668	4.716233
Probability	0.050169	0.024015	0.000000	0.400908	0.164574	0.003765	0.000806	0.051543	0.094598
Observations	110	110	110	110	110	110	110	110	110

Source: *Author`s Computation 2026 (E-views 9)*

Table 3 presents the descriptive statistics of the variables used in the study. The mean return on equity (ROE) is 14.16, indicating an average profitability level for the banks in the sample. The capital adequacy ratio (CAR) has a mean of 18.72, showing that, on average, the banks maintain a healthy capital buffer. Asset quality (AQ) has a mean of approximately 2.64 × 10^8, suggesting a large variation in asset quality across the sample. Liquidity management (LM) averages 42.07, while the cost-income ratio (CIR) is 66.62, indicating the proportion of costs relative to income. The bank size (LBSZ) has a mean of 13.19, indicating a reasonable size for most of the banks. Interest rate (INT) averages 13.68, while inflation rate (INFR) has a mean of 14.65. The exchange

rate (EXR) averages 317.17, showing significant variation over the study period. The standard deviations of the variables reveal the extent of dispersion in the data, with AQ having the highest variability, followed by EXR and CIR. The skewness and kurtosis values show that most variables are relatively symmetrical, with a few exceptions, such as AQ, which is highly positively skewed and has high kurtosis, indicating extreme values. The Jarque-Bera test indicates that several variables, including AQ and CAR, are not normally distributed, which might affect statistical inference

Table 4: Panel Unit Root Result

Variable	Levin, Lin & Chu t* statistics	Probability Value	ADF - Fisher Chi-square	Probability value	Stationarity	Remark
AQ	-29.8858	0.0000	16.0291	0.0344	Levels	I(0)
CAR	-38.4995	0.0000	20.1314	0.0448	Levels	I(0)
CIR	14.6973	0.0000	17.7549	0.0204	Levels	I(0)
EXR	-19.1136	0.0000	80.8992	0.0000	Levels	I(0)
INFR	-10.3336	0.0000	11.1943	0.0019	Levels	I(0)
INT	13.3917	0.0000	28.5685	0.0000	Levels	I(0)
LBSZ	33.8042	0.0000	6.75291	0.0429	Levels	I(0)
LM	-5.02277	0.0000	23.8911	0.0030	Levels	I(0)
ROE	20.2110	0.0000	25.9300	0.0027	Levels	I(0)

Source: *Researchers Compilation (2026)*

Table 4 shows the results of the panel unit root tests for the variables, using both Levin, Lin & Chu t* statistics and ADF - Fisher Chi-square statistics. The results indicate that all variables—AQ, CAR, CIR, EXR, INFR, INT, LBSZ, LM, and ROE are stationary at levels (I(0)), as their probability values are all less than the 5% significance level, except for AQ and CAR which also show strong significance (p-values of 0.0000). This suggests that these variables do not require differencing to achieve stationarity, which is important for the reliability of the subsequent econometric analyses. The stationarity at levels indicates that the variables do not have unit roots, and hence, their relationships can be analyzed without concern for spurious results, making the data suitable for further modeling and regression analysis.

Table 5 Correlation Result ROE

	ROE	CAR	AQ	LM	CIR	LBSZ	INT	INFR	EXR
ROE	1.000000								
CAR	0.435199	1.000000							
AQ	-0.126466	0.058318	1.000000						
LM	0.405751	0.467714	0.082516	1.000000					
CIR	0.743127	-0.578757	0.187031	-0.515474	1.000000				
LBSZ	0.401994	-0.437000	0.388835	-0.514984	0.705215	1.000000			
INT	0.299424	-0.116102	-0.098886	0.066351	-0.146116	0.010178	1.000000		
INFR	-0.211761	-0.082626	-0.032022	0.135931	-0.164793	0.006356	0.802874	1.000000	
EXR	-0.161781	-0.059075	0.052426	0.222305	-0.105801	0.004394	0.623736	0.858424	1.000000

Source: *Author's Computation (2026)*

From Table 4.3, only asset quality (AQ), inflation (INFR) and exchange rate (EXR) had an inverse relationship with ROE as a bank stability measurement. This means that as they increase, ROE decreases by -0.126466 (12%), -0.211761 (21%), and -0.161781 (16%) respectively. However, CAR, LM, CIR, LBSZ, and INT all move in the same direction with ROE as they positively correlate with it and would push ROE forward by 43%, 40%, 74%, 40%, and 29% respectively.

Hausman Test (ROE)

Table 6: Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	8	1.0000

Source: *Researchers compilation (2026)*

It was used to select which panel regression to utilise between the fixed-effect and random-effect panel regression. The decision criterion was to reject the null hypothesis of random-effect regression if the probability value of the Chi-square Statistic was significant at 5% significant level (p-value lesser than 0.05). From Table 6, the Chi-Square Statistic probability value of 1.0000 was insignificant at 5% significant level (p-value is more than 0.05) to mean that the random-effect model should be selected for the estimation.

Table 7: Random Effect Regression (ROE)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-25.81519	6.992202	-3.691997	0.0004
CAR	0.558657	0.229294	2.436424	0.0166
AQ	-1.119222	0.300039	-3.730256	0.0003
LM	0.487257	0.202103	2.410930	0.0177
CIR	0.431931	0.062162	6.948414	0.0000
LBSZ	0.002678	0.048768	0.054919	0.9563
INT	-2.08E-09	1.18E-09	-1.767470	0.0802
INFR	-0.005739	0.128953	-0.044508	0.9646
EXR	-0.013685	0.009217	-1.484770	0.1407
R^2 = 0.50	Adjusted R^2 = 0.44	Durbin-Watson Test = 1.61	F-statistic= 11.61111	Prob(F-statistic) = 0.000000

Source: *Author`s Computation (2025)*

Random Effect Regression (ROE)

From Table 7 and examining the coefficient signs, there was a positive relationship between CAR, LM, CIR, and LBSZ with ROE. This was because their coefficient values of 0.558657, 0.487257, 0.431931, and 0.002678 respectively carry positive signs. It means that an increment in CAR, LM, CIR, and LBSZ would cause a direct increment in ROE by 55%, 48%, 43%, and 0.2% respectively. However, AQ, INT, INFR, and EXR had negative relationship with ROE with coefficient figures of -1.119222, -2.08E-09 (-2080000), -0.005739, and -0.013685 respectively. This means that a

unit increase in the three variables would cause decrease in ROE by 111%, 208%, 0.5%, and 1.3% respectively.

Also, Table 7 showed the significance of each independent variable in the model, which was used to test the study hypothesis. Using the 5% significant level, the probability values of CAR, AQ, LM, and CIR were significant with probability values of 0.0166, 0.0003, 0.0177, and 0.0000 respectively which were lower than 5% significant figures (p. value is less than 0.05). However, the probability values of LBSZ, INT, INFR, and EXR were insignificant at 5% significant level with figures 0.9563, 0.0802, 0.9646, and 0.1407 respectively and were higher than 5% significant level (p. value is higher than 0.05).

The R-squared figure of measured the goodness of fit of the model had a value of approximately 0.50 to show that all the independent plus control variables explain 50% of ROE variations. After adjusting for degree of freedom, the adjusted R-squared was approximately 0.44 (44%).

The F-statistics measured the joint significance of the independent plus control variables in impacting ROE. Its probability value of 0.000000 was significant at 5% significant level to prove that they all have joint significant impact on ROE.

Finally, the durbin-watson test value of 1.61 was approximately 2 to suggest a minimal autocorrelation in the residual and prove that all the independent and control variables are not related but stand alone.

Post Estimation Tests

Redundant Fixed Effects Test

Table 8: Redundant Fixed Effects Test Result

Effects Test	Statistic	d.f.	Prob.
Cross-section F	5.085441	(10,91)	0.0000
Cross-section Chi-square	48.833595	10	0.0000

Source: *Researchers compilation (2026)*

It was utilised to check the joint significance of all the independent plus control variables on ROE and corroborate the f-statistic regression result. The probability figure of the Cross-Section F must be significant at 5% significant level (probability value less than 0.05) to confirm the joint significance. The F in the Cross-Section F in Table 8 represented F-statistics and its probability value of 0.0000 was significant at 5% significant level to show that all the independent and control variables were jointly significant in impacting ROE.

Breusch Pagan LM Test for Auto Correlation

Table 9: Breusch Pagan LM Test Result

Test	Statistic	d.f.	Prob.
Breusch-Pagan LM	72.90437	55	0.0634

Source: *Researchers Compilation (2026)*

This was used to test for autocorrelation in the panel data and confirm the durbin-watson test assertion. The null hypothesis showed no presence of autocorrelation. From Table 9, the probability value of 0.0634 was insignificant at 5% significant level to show that there was no autocorrelation in the model.

Discussion of Findings

The results of the research findings indicate that, capital adequacy ratio (CAR), liquidity management (LM), cost-income ratio (CIR), and bank size (LBSZ) are positively correlated to the return on equity (ROE). In particular, a 1 percent rise in these variables translates into huge rises in ROE-55 percent for CAR, 48 percent for LM, 43 percent for CIR, and 0.2 percent for LBSZ. This correlates with the literature, since a number of studies, including Olawale (2024) and Mulyani, Oktaviani, and Fauziyah (2025), have pointed out that capital adequacy is extremely crucial in improving the performance of the banks. The positive relationship between CAR and ROE confirms the fact that sufficient capital buffers can enable banks to absorb shocks and enhance their financial performance. On the same note, the positive correlation between liquidity management and ROE is aligned with Gupta and Kashiramka (2020) which reported that liquidity increases bank stability and profitability. In addition, the positive correlation between cost-income ratio and ROE indicates that effective cost management can be used to enhance the financial performance of banks (Aniemeke, 2024).

On the other hand, asset quality (AQ), interest rate (INT), inflation rate (INFR), and exchange rate (EXR) depict negative correlations with ROE; this implies that the deterioration of asset quality, poor interest rates, inflation, and the exchange rate are not beneficial to the profitability of banks. This aligns with the results of other research studies as Ugorji, Nduokafor, and Okolie (2025) and Ashwath and Sachindra (2025) which pointed out the negative impacts of non-performing loans and macro-economic factors on the stability and the performance of banks. The negative effect of asset quality on ROE is substantial, which is consistent with the idea that ineffective asset management decreases the capability of banks to generate profits and exposes them to the risk of financial distress (Oseni, 2024). Moreover, the non-significance of the bank size, interest rates, inflation, and exchange rates at the 5% level of significance indicates that although these variables could affect ROE, their impact is not statistically significant in the present study, a fact that is in line with the mixed findings in the literature on the importance of external macroeconomic factors on bank stability (Gupta & Kashiramka, 2020; Widyatmoko & Risman, 2024).

Conclusion and Policy Recommendations

This paper examined how capital adequacy impacts on bank stability in Nigeria. It was found that the internal factors that have a significant impact on the ROE, which is a measure of bank stability, are capital adequacy ratio (CAR), liquidity management (LM), cost-income ratio (CIR), and bank size (LBSZ). In particular, the growth in CAR, LM, CIR, and LBSZ were found to have positive effects on ROE indicating that these variables have a positive contribution to the profitability and stability of Nigerian banks. On the other hand, the external factors such as asset quality (AQ), interest rates (INT), inflation (INFR) and exchange rates (EXR) reflected a negative relationship with ROE indicating the unstable situation of macroeconomic variables on the stability of banks. Although the independent variables accounted about 50 percent of the variance in ROE, others, which are bank size and interest rates, were found to be statistically insignificant, meaning that the effect that they have on the ROE may be conditional or depend on the effect of other factors.

Policy Recommendations:

1. Given the positive impact of CAR on ROE, it is recommended that the Central Bank of Nigeria (CBN) strengthens capital adequacy regulations for banks. Higher capital buffers would enhance the resilience of banks, allowing them to better absorb financial shocks and maintain stability in times of economic stress.

2. The positive relationship between liquidity management (LM) and ROE suggests that banks should focus on optimizing liquidity to ensure profitability and stability. Regulatory guidelines could be established to encourage banks to maintain sufficient liquidity to navigate economic fluctuations effectively.

3. The study highlights the importance of the cost-income ratio (CIR) in determining bank performance. Banks should adopt more cost-effective operational strategies, particularly through technological innovations, to enhance operational efficiency, reduce costs, and ultimately improve profitability.

4. Given the negative relationship between asset quality (AQ) and ROE, banks must improve their asset portfolios by reducing non-performing loans (NPLs) and enhancing credit risk management practices. Regulatory authorities should enforce stricter guidelines on loan classification and provisions for bad debts to safeguard financial stability.

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