



Impact of Capital Adequacy Ratio of Quoted Deposit Money Banks in Nigeria

Akintayo Oluwatoyin Olusola Alex Ph.D*

Department of Accounting, Faculty of Management Sciences, Bamidele Olumilua University of Education, Science & Technology Ikere Ekiti, Ekiti State, Nigeria

DOI: 10.5281/zenodo.23266283

ARTICLE INFO

Article history:

Received : 10-09-2026

Accepted : 25-09-2026

Available online : 09-10-2026

Copyright©2026 The Author(s):

This is an open-access article distributed under the terms of the Creative Commons Attribution 4.0 International License (CC BY-NC) which permits unrestricted use, distribution, and reproduction in any medium for non-commercial use provided the original author and source are credited.

Citation: Akintayo, O. O. A. (2025). Impact of Capital Adequacy Ratio of Quoted Deposit Money Banks in Nigeria. *IKR Journal of Economics, Business and Management (IKRJEBM)*, 1(2), 13-26.



ABSTRACT

Original Research Article

This study investigated the effect of the Capital Adequacy Ratio (CAR) on the financial performance of quoted deposit money banks in Nigeria, specifically examining its influence on Return on Assets (ROA) and Return on Equity (ROE) while controlling for firm size and leverage. The study was motivated by the importance of adequate capitalization in maintaining banking-sector stability, regulatory compliance, and profitability, particularly in emerging economies where financial-sector resilience is essential. A quantitative research design was employed using secondary panel data obtained from the audited financial statements and annual reports of 10 quoted Nigerian deposit money banks covering the period 2014–2024. Panel regression techniques, including Pooled Ordinary Least Squares, Fixed Effects, and Random Effects models, were employed, with the Hausman test guiding the selection between the Fixed Effects and Random Effects models. Descriptive statistics, correlation analysis, and diagnostic tests were also conducted to establish the robustness of the results. The findings revealed that CAR had a positive but statistically insignificant effect on ROA ($\beta = 0.0434$, $p = 0.196 > 0.05$) and ROE ($\beta = 0.0283$, $p = 0.853 > 0.05$). Consequently, the null hypotheses (H01 and H02), which stated that CAR has no significant effect on ROA and ROE, were not rejected, suggesting that although capital adequacy strengthens regulatory stability, it does not directly translate into improved profitability. Firm size, however, exerted a positive and statistically significant effect on ROA ($\beta = 0.5809$, $p = 0.001 < 0.05$) and ROE ($\beta = 6.6821$, $p = 0.000 < 0.05$), indicating that larger banks may benefit from economies of scale and greater operational efficiency. Leverage recorded a negative but statistically insignificant effect on ROA ($\beta = -7.5411$, $p = 0.219 > 0.05$) and ROE ($\beta = -5.9450$, $p = 0.642 > 0.05$), indicating that debt levels did not significantly influence profitability among the sampled banks. The overall models explained approximately 48% of the variation in ROA and 42% of the variation in ROE, confirming the joint explanatory contribution of the variables. The study concludes that although CAR remains important for regulatory compliance and financial stability, profitability among quoted Nigerian deposit money banks is more strongly associated with firm size and operational capacity. It therefore recommends that banks prioritize efficient capital utilization, sustainable growth strategies, and operational efficiency to improve financial performance.

Keywords: Capital Adequacy Ratio, Financial Performance, Deposit Money Banks, Return on Assets, Return on Equity.

*Corresponding author: Akintayo Oluwatoyin Olusola Alex Ph.D

Department of Accounting, Faculty of Management Sciences, Bamidele Olumilua University of Education, Science & Technology Ikere Ekiti, Ekiti State, Nigeria

Introduction

The banking sector in Nigeria has historically been confronted with challenges that threaten its stability and efficiency, including bank failures, financial distress, and systemic risks arising from poor capital management and exposure to non-performing loans. Despite the regulatory outlines such as that of the Central Bank of Nigeria (CBN) capital adequacy requirements and Basel accords, many banks continue to experience volatility in profitability and occasional liquidity constraints, which raise questions about the effectiveness of capital regulation in ensuring optimal performance (Obadimu & Oboh, 2025).

Capital Adequacy Ratio is designed to serve as a buffer against financial shocks, ensuring that banks can absorb unexpected losses and continue operations without threatening depositors' funds. However, empirical evidence on the relationship between CAR and financial performance remains mixed. Some studies indicate a positive and significant relationship, suggesting that higher capital levels improve profitability and operational resilience (Festus et al., 2025). Conversely, other research highlights that excessive capitalization may limit banks' profitability due to reduced leverage opportunities and the opportunity cost of holding idle funds (Patel & Kanchan, 2024).

The dilemma is further compounded by economic factors such as inflationary pressures, foreign exchange volatility, and evolving regulatory standards, including the CBN's revised minimum capital requirements in 2024 (Reuters, 2024). While regulatory authorities advocate for higher capital buffers to mitigate risks, the impact of these requirements on the financial performance of quoted Deposit Money Banks remains unclear. Questions arise regarding whether banks that maintain CAR above the regulatory minimum indeed experience superior profitability and asset efficiency, or whether the additional capital merely reduces earnings potential.

Moreover, the relationship between Capital Adequacy Ratio and bank performance has been studied in many researches, however much of the literature is based on aggregated data for the banking sector or previous eras of observation. Hence, there is little empirical evidence on current developments among the listed Deposit Money Banks in Nigeria. For example, Akande (2025) examined the impact of capital adequacy and liquidity management on the financial performance of listed Nigerian banks and found that capital adequacy had a positive effect on profitability, although the magnitude of the effect varied across individual banks and performance measures. Similarly, Festus et al. (2025) in their study of listed banks in selected countries in Sub-Saharan Africa including Nigeria, established a significant positive association between CAR and Return on Equity, but noted that the strength of the association was influenced by macroeconomic conditions and bank-specific characteristics.

Obadimu and Oboh (2025) also looked into the link between banking regulation and the financial performance of Nigerian banks and found that there was significant compliance with the CAR requirements, but its direct link with profitability indicators such as ROA and ROE was not consistently statistically significant. The mixed evidence reported in these studies reveals the complexity of the relationship between capital adequacy and bank profitability and further affirms the need for a current, targeted and empirical review of the impact of CAR on key financial performance indicators, especially ROA and ROE within the Nigerian banking sector under contemporary regulatory and economic environment.

Against this backdrop, the current study attempts to fill the identified gap by empirically investigating the effect of Capital Adequacy Ratio on financial performance of quoted Deposit Money Banks in Nigeria thereby providing evidence on the appropriate balance between regulatory compliance, risk management and profitability. The study specifically seeks to;

- Evaluate the effect of Capital Adequacy Ratio on the Return on Assets (ROA) of listed Deposit Money Banks.
- Ascertain the effect of Capital Adequacy Ratio on the Return on Equity (ROE) of listed Deposit Money Banks in Nigeria.
- Investigate the influence of the control variables (Firm Size and Leverage) on the relationship between Capital Adequacy Ratio and financial performance of listed Deposit Money Banks in Nigeria.

To achieve these aims, the study is organised into five main sections: introduction, literature review, methodology, empirical results and conclusions and suggestions.

Literature Review

Theoretical Framework

This article is based on trade-off theory. The Trade-Off Theory of Capital Structure, introduced by Kraus and Litzenberger in 1973, suggests that enterprises weigh the benefits and drawbacks of debt financing to arrive at an optimal capital structure. The theory suggests that debt financing has an advantage of a tax shield, as interest payments can be deducted from taxable income. This can increase the value and profitability of a corporation. But debt also raises the possibility of financial distress and bankruptcy fees. It is argued that banks and other companies try to weigh the benefits of leverage such as tax savings against the costs of financial distress. This trade-off determines their capital and performance decisions.

In banking sector, the Trade-Off Theory is particularly relevant because banks operate under regulatory capital requirements while seeking to maximize returns on equity. High leverage can magnify returns, improving metrics such as Return on Equity (ROE), but it simultaneously elevates the risk of insolvency, non-performing loans, and regulatory breaches. Recent studies in emerging economies, including Nigeria, highlight that deposit money banks must navigate this trade-off carefully: maintaining sufficient equity and

capital buffers to meet Capital Adequacy Ratio (CAR) standards while leveraging debt to fund operations and enhance profitability (Ibrahim & Oladipo, 2024). Empirical evidence by Adewuyi and Azeez, (2023) reveals that banks with moderate leverage ratios aligned with regulatory benchmarks, tend to achieve better financial performance, as excessive debt increases default risk and reduces stability.

The Trade-Off Theory also offers insights into strategic capital allocation. By framing capital structure decisions as a balance between risk and reward, the theory supports the understanding that banks' choices regarding debt, equity, and retained earnings influence both short-term profitability and long-term resilience. Studies have shown that Nigerian deposit money banks with higher capital buffers, even while maintaining moderate leverage, report lower non-performing loan ratios and more consistent Return on Assets (ROA) outcomes, illustrating the moderating effect of regulatory capital requirements on the leverage-profitability relationship (Nwachukwu et al., 2023).

Empirical Review

There is much empirical evidence on the capital adequacy ratio and bank financial performance. In diverse banking environment, the results are mixed but generally good. For example, Khairi et al (2024) examined the influence of Return on Equity (ROE), Capital Adequacy Ratio (CAR), and Financing to Deposit Ratio (FDR) on Return on Assets (ROA) of PT Bank Muamalat Tbk using quarterly secondary data from 2014 to 2023. Multiple linear regression analysis was performed using SPSS version 29. The F-test at 0.05 level of significance indicated that ROE, CAR and FDR together have substantial effect on ROA. However, the t-test showed that the individual effect of ROE on ROA was statistically significant, while the individual influence of CAR and FDR was statistically negligible. The model gave a R value of 0.993 and a R² of 0.986 indicating that 98.6% of the variation in ROA was explained by the explanatory variables. The authors concluded that CAR contributes to overall financial performance, but its standalone contribution may be dependent on additional profitability variables.

Wanjiru et al (2024) further studied the impact of capital sufficiency on the financial performance of 39 commercial banks in Kenya using an explanatory research design and unbalanced panel regression analysis. The results of their study state that capital sufficiency has a positive and significant effect on financial performance with a regression coefficient value of $\beta = 0.0333113$ and $p = 0.027$ which is less than the significance level of 0.05. The study also indicated that about 67% of the studied banks had attained the requisite regulatory cash ratio, but 33% were still facing liquidity issues. The authors argue that better capital buffers boost the profitability and stability of banks.

Abonyi and Ogbada (2025) used a fixed effects model to examine panel data from listed deposit money banks between

2014 and 2023 in Nigeria. Their results showed that CAR had a strong, positive and statistically significant effect on Return on Assets (ROA), but Tier 1 leverage ratio and equity to assets ratio were not statistically significant. The study found that capital sufficiency continued to be a significant driver of profitability and resilience for Nigerian banks, especially in the face of macroeconomic uncertainty.

Likewise, Ihejirika et al. (2024) investigated the influence of capital adequacy on shareholders' returns in Nigerian deposit money banks using NDIC data from 2004 to 2022. The study used ARDL modelling and Granger causality approaches. The findings show that total qualifying capital, adjusted shareholders' fund and capital to risk-weighted asset ratio has positive substantial effects on Return on Equity (ROE). The authors concluded that capital sufficiency is a major determinant of shareholders' wealth and enhances investors' confidence in the Nigerian banking sector.

Ahmed and Haruna (2023) also studied 14 listed Nigerian deposit money banks from 2014 to 2023 using panel regression methodology. Their study reveals CAR had favourable and significant effect on Return on Assets (ROA) at 5% significance level. However, the foreign exchange risk and operational risk were positive but not statistically significant. The study also found that good capital positions boost profitability, but this should be paired with adequate risk management frameworks.

Obiedallah and Abdelaziz (2024) employed 360 quarterly data from 2013 to 2021 to analyse 10 listed Egyptian banks using linear mixed models outside Nigeria. The study indicated that CAR moderated considerably in the link between financial inclusion characteristics and bank financial performance. In particular, a larger CAR increased the favourable relation of deposit growth, loan growth and profitability metrics. The authors found that capital sufficiency improves banks' ability to grow inclusively and preserve performance stability.

Conceptual Framework

The theoretical and logical relationship between Capital Adequacy Ratio (CAR) and Bank Financial Performance is explained by the conceptual framework of this research. It also considers the key control variables that could influence the relationship. It gives systematic picture of the effect of independent variable on dependent variable in banking industries.

Capital Adequacy Ratio (CAR) represents the core independent variable of the study. It measures the proportion of a bank's regulatory capital to its risk-weighted assets and reflects the bank's ability to absorb unexpected losses and withstand financial shocks. The framework assumes that a higher CAR enhances a bank's stability, risk management capacity, and depositor confidence, which in turn positively influences profitability and overall financial performance.

Bank Financial Performance constitutes the dependent variable and is measured using Return on Assets (ROA) and Return on Equity (ROE). ROA evaluates how efficiently management utilizes total assets to generate profits, while ROE measures the returns generated for shareholders. These two indicators are widely accepted in banking and financial literature as reliable measures of performance.

The conceptual linkage between CAR and financial performance is grounded in Regulatory Theory, Buffer Theory, and Trade-Off Theory. Regulatory and Buffer theories suggest that adequate capital strengthens resilience and promotes sustainable profitability. However, Trade-Off Theory acknowledges that excessively high capital levels may reduce leverage benefits and lower return on equity. Therefore, the relationship may be positive but subject to optimal levels.

To strengthen the model and reduce omitted variable bias, the framework incorporates control variables, including:

- Firm Size: Larger banks may benefit from economies of scale and diversification advantages.
- Leverage: Higher leverage increases financial risk and may influence profitability.

Below is the diagrammatic representation of the conceptual framework:

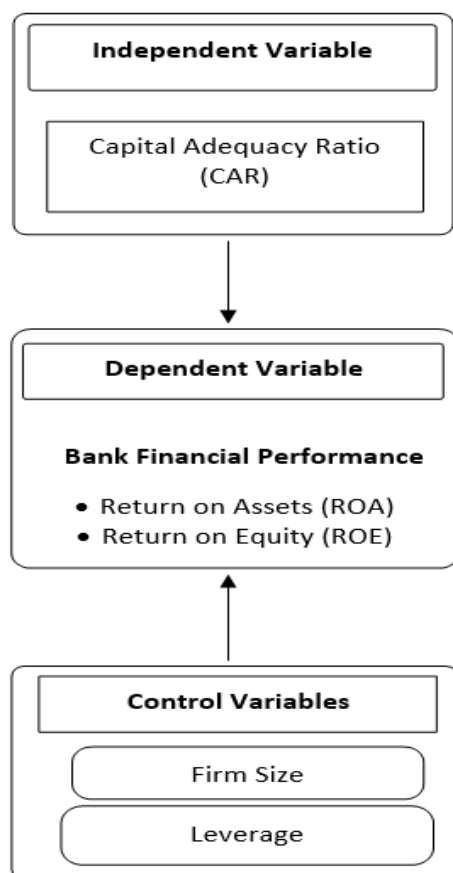


Figure 1: Conceptual Framework illustrating the relationship between Capital Adequacy Ratio (CAR) and Bank Financial Performance

Source: Researcher's Computation, 2026

Methodology

The study utilised a quantitative research methodology, namely a descriptive-causal research approach to evaluate the effect of Capital Adequacy Ratio (CAR) on the financial performance of listed Deposit Money Banks (DMBs) in Nigeria. Descriptive research is suited to provide a full description of the present state of variables and causal research is good for evaluating the link and the influence of independent variables on dependent variables across time (Sekaran & Bougie, 2022). For the period the study on banks listed on the Nigerian Exchange Group (NGX) used secondary panel data to verify data reliability and consistency. The design enables for the detection of trends, connections and patterns in CAR, firm size, leverage and financial performance indicators like ROA and ROE. The descriptive approach was chosen because it allows for robust statistical analysis through the use of panel regression techniques that take into account cross-sectional (across banks) and longitudinal (over time) variation. The population of the study is all quoted deposit money banks in Nigeria. a deposit money bank means a banking institution licensed by the Central Bank of Nigeria to accept deposits, provide loans and offer other banking services. Only banks traded on the stock exchange are included, since their financial statements are public, audited and reported in a consistent manner, which makes them reliable for statistical research. As at 2025, the Nigerian Exchange Group has thirteen (13) deposit money banks listed. The sample is composed of large commercial banks with broad financial activities and enough observations across many periods to enable panel analysis.

The study employs purposive sampling, a non-probability sampling technique where the researcher selects subjects based on data availability and relevance to the research objectives (Etikan et al., 2021). Purposive sampling ensures that only banks with consistent reporting and complete data are included, thereby enhancing the quality of statistical inference.

Based on this, banks were selected based on the following criteria:

1. They must be listed on the NGX throughout the study period (2014–2024).
2. They must have complete audited financial statements for the entire period.
3. They must consistently disclose components necessary for computing CAR, ROA, ROE, and control variables.

Ten (10) deposit money banks were sampled based on these characteristics. The study used secondary data from audited financial statements and annual reports of sampled deposit money institutions which were obtained from the Nigerian Stock Exchange website. The preference for secondary data was because it is dependable, available and standardised so that it can be compared across banks and years.

The study investigated the effect of Capital Adequacy Ratio on the financial performance of listed deposit money banks in Nigeria. The variables employed in the study are dependent variables, independent variables and control factors. Their measurements are defined in the following way:

Dependent Variables: The financial Performance is monitored by employing two indicators of profitability that are Return on Assets (ROA) and Return on Equity (ROE). The Return on Assets (ROA) is calculated as net profit after tax over total assets. It measures how efficiently a bank uses its entire assets to earn income. Return on equity (ROE) is the net profit after tax divided by shareholders' equity. It shows the return achieved on the invested funds of shareholders and reflects the total profitability from the point of view of the owners.

Independent Variable: The main explanatory variable is the Capital Adequacy Ratio (CAR). CAR is calculated as total

regulatory capital / risk weighted assets. It shows the bank's sufficiency of capital and ability to cover possible losses while maintaining financial stability. A higher CAR means a better capital base relative to risk exposures.

Control Variables: Two control variables are added to avoid the omitted variable bias. Firm size (FSIZE) is measured by the natural logarithm of total assets. Log transformation reduces the discrepancies in scale and normalises the distribution of the data. Leverage (LEV) is total debt divided by total assets. It indicates the share of assets funded by debt and indicates how much financial risk the bank is exposed to.

These measurements are consistent with prior empirical studies and ensure that the variables are operationalized in a manner suitable for panel regression analysis.

The above information is stated in table 1 below:

Table 1: Measurement of Variables

Variable	Formula	Measurement	Sources	Prior Expectation
Return on Assets (ROA)	Net Profit ÷ Total Assets	Dependent variable representing profitability measured as profit after tax divided by total assets at year end	Annual Reports (2014–2024) / Company Websites	Positive
Return on Equity (ROE)	Net Profit ÷ Shareholders' Equity	Dependent variable representing shareholders' return measured as profit after tax divided by total equity	Annual Reports (2014–2024) / Company Websites	Positive
Capital Adequacy Ratio (CAR)	Total Regulatory Capital ÷ Risk-Weighted Assets	Independent variable measuring the bank's capital strength and ability to absorb losses	Annual Reports (2014–2024) / Central Bank Publications	Positive
Firm Size (FSIZE)	ln (Total Assets)	Control variable measured as the natural logarithm of total assets to capture bank size	Annual Reports (2014–2024) / Company Websites	Positive
Leverage (LEV)	Total Debt ÷ Total Assets	Control variable measuring the proportion of assets financed by debt, indicating financial risk	Annual Reports (2014–2024) / Company Websites	Negative

Model Specification

To examine the impact of Capital Adequacy Ratio on bank performance, the study employed panel regression models. Two separate models were specified to analyze the effects on ROA and ROE. The models incorporate CAR as the independent variable, FSIZE and LEV as control variables, and ROA and ROE as dependent variables.

Model 1 (Effect on ROA):

$$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 FSIZE + \beta_3 LEV_{it} + \mu_i + \varepsilon_{it}$$

Model 2 (Effect on ROE):

$$ROE_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 FSIZE + \beta_3 LEV_{it} + \mu_i + \varepsilon_{it}$$

Where:

ROA_{it} = Return on Assets of bank i at time t

ROE_{it} = Return on Equity of bank i at time t

CAR_{it} = Capital Adequacy Ratio of bank i at time t

$FSIZE_{it}$ = Firm Size of bank i at time t

LEV_{it} = Leverage of bank i at time t

β_0 = Intercept

$\beta_1 - \beta_3$ = Coefficients of explanatory variables

μ_i = Unobserved bank-specific effect

ε_{it} = Stochastic error term

The models allow for the assessment of both between-bank and within-bank effects, controlling for unobserved heterogeneity.

Estimation Techniques

To ensure the reliability and validity of the empirical findings, the study applied panel data regression techniques and associated diagnostic tests. The estimate approaches used were Pooled Ordinary Least Squares (Pooled OLS), Fixed Effects (FE) and Random Effects (RE) models. The choice between these models was based on the Hausman specification test for determining whether the unobserved

bank-specific effects are connected with the explanatory variables. The Pooled OLS model does not take into account the heterogeneity across the banks and it provides the base estimates, but it may produce bias results when unobserved effects exist. The Fixed Effects model compensates for time-invariant bank-specific features such as managerial quality, operational structure and institutional legacy that may affect profitability. The Random Effects model however implies that the bank-specific effects are uncorrelated with the regressors and gives more efficient estimates if this assumption is true. The significance of the model and its

explanatory power was determined by Wald chi-square statistics and R-squared values respectively. Individual coefficients were determined through t-statistics at 5% level of significance ($p < 0.05$). In addition, diagnostic tests were run to confirm the assumptions of the regression, such as the Breusch–Pagan or White test for heteroscedasticity, the Durbin–Watson or Wooldridge test for serial correlation, and the Variance Inflation Factor (VIF) test for multicollinearity. These tests indicate that the regression estimates are unbiased, efficient and suitable for drawing sound academic and policy conclusions.

Empirical Results

Table 2: Descriptive Statistics

Variable	Obs.	Mean	Std. Dev.	Min	Max
CAR (Capital Adequacy Ratio %)	101	13.30	5.45	6.88	36.14
ROA (Return on Assets %)	101	1.72	1.17	0.40	6.87
ROE (Return on Equity %)	101	15.43	7.82	2.11	38.30
FSIZE (Firm Size)	101	15.19	0.84	13.71	17.54
LEV (Leverage)	101	0.89	0.038	0.73	0.94
Bank (Deposit Money Bank)	101	5.62	2.86	1	10
Year (2014-2024)	101	6.13	3.21	1	11

Source: *Researcher's Computation, (2026)*

The descriptive statistics in table 2 provide an overview of the financial characteristics of the sampled deposit money banks between 2014 and 2024. The Capital Adequacy Ratio (CAR) has a mean of 13.30% with a standard deviation of 5.45, indicating moderate variation in banks' regulatory capital levels, with values ranging from a minimum of 6.88% to a maximum of 36.14%. Return on Assets (ROA) averaged 1.72%, with a standard deviation of 1.17%, suggesting that profitability relative to total assets is generally low but exhibits some variability across banks and years. Return on

Equity (ROE) shows a higher mean of 15.43% and a standard deviation of 7.82%, reflecting that shareholders' returns vary substantially among the banks, with a minimum of 2.11% and a maximum of 38.30%. The average firm size (FSIZE) is 15.19, indicating moderately large banks, while leverage (LEV) is consistently high (mean = 0.89), showing that banks rely significantly on debt financing. While the bank max of 10 and year of 11 mean that, the data cover ten banks over 11 years by ensuring adequate temporal and cross-sectional representation.

Table 3: Summary of Multicollinearity

Variable	VIF	1/VIF
CAR	1.83	0.5453
LEV	1.83	0.5454
FSIZE	1.12	0.8939
Mean VIF	1.60	—

Source: *Researcher's Computation, (2026)*

Table 3 Variance Inflation Factor (VIF) results are used to assess multicollinearity among the explanatory variables in regression. Multicollinearity occurs when two or more independent variables are highly correlated, which can distort regression estimates and reduce the reliability of coefficient significance tests. So, CAR (Capital Adequacy Ratio) and LEV (Leverage) both have VIF values of 1.83, while FSIZE (Firm Size) has a VIF of 1.12. All values are below the

commonly accepted threshold of 10, suggesting that multicollinearity is not a serious concern in the model. Likewise, the corresponding 1/VIF values, ranging from 0.5453 to 0.8939, further support this conclusion. The mean VIF of 1.60 indicates that, overall, the explanatory variables are reasonably independent, ensuring reliable coefficient estimates and valid inference in the regression analysis.

Table 4: Correlation Matrix

Variables	ROA	ROE	CAR	FSIZE	LEV
ROA	1.0000				
ROE	0.8594*	1.0000			
	0.0000				
CAR	0.5095*	0.2339*	1.0000		
	0.0000	0.0186			
FSIZE	0.4421*	0.6344*	0.1395	1.0000	
	0.0000	0.0000	0.1641		
LEV	-0.4567*	-0.0968	-0.6339*	0.1392	1.0000
	0.0000	0.3356	0.0000	0.1651	

Source: *Researcher's Computation, (2026)*

Model 1: Return on Assets (ROA) as Dependent Variable

The correlation analysis in table 4 for Model 1 shows the strength and direction of relationships between ROA and the explanatory variables. CAR exhibits a positive and statistically significant correlation with ROA ($r = 0.5095$, $p < 0.01$), indicating that banks with higher capital adequacy tend to achieve better asset utilization and operational efficiency. This aligns with theoretical expectations that adequate capital buffers support stability, reduce risk exposure, and enhance

the efficiency of asset deployment in banks (Tarawneh & Elayan, 2024). Firm Size (FSIZE) is also positively and significantly correlated with ROA ($r = 0.4421$, $p < 0.01$), suggesting that larger banks are able to leverage economies of scale and diversified operations to improve profitability. In contrast, Leverage (LEV) shows a negative and significant correlation with ROA ($r = -0.4567$, $p < 0.01$), implying that highly leveraged banks may experience reduced efficiency and profitability due to higher financial risk.

Table 5: Panel Diagnostic Tests for Model 1, Model 2

MODEL 1: ROA		
Test / Statistic	Model 1	Decision
Wooldridge Test (Autocorrelation)	$F(1,9) = 2.982$, $p = 0.1183$	Fail to reject null; no first-order autocorrelation
Hausman Test (Fixed vs Random Effects)	$\chi^2(3) = 1.03$, $p = 0.7945$	Fail to reject null; Random Effects preferred
Breusch-Pagan LM Test (Random Effects vs Pooled OLS)	$\text{chibar}^2(01) = 138.61$, $p = 0.0000$	Reject null; Random Effects model appropriate
Pesaran's Test (Cross-sectional Dependence)	4.160 , $p = 0.0000$	Reject null; cross-sectional dependence present
Modified Wald Test (Groupwise Heteroskedasticity)	$\chi^2(10) = 1442.23$, $p = 0.0000$	Reject null; heteroskedasticity present
MODEL 2 (ROE)		
Test / Statistic	Model 1	Decision
Wooldridge Test (Autocorrelation)	$F(1,9) = 1.309$, $p = 0.2821$	Fail to reject null; no first-order autocorrelation
Modified Wald Test (Groupwise Heteroskedasticity)	$\chi^2(10) = 4550.52$, $p = 0.0000$	Reject null; heteroskedasticity present
Hausman Test (Fixed vs Random Effects)	$\chi^2(3) = 1.86$, $p = 0.6025$	Fail to reject null; Random Effects preferred
Breusch-Pagan LM Test (Random Effects vs Pooled OLS)	$\text{chibar}^2(01) = 103.03$, $p = 0.0000$	Reject null; Random Effects model appropriate
Pesaran's Test (Cross-sectional Dependence)	5.377 , $p = 0.0000$	Reject null; cross-sectional dependence present

Source: *Researcher's Computation, (2026)*

Model 1: Return on Assets (ROA)

For Model 1, which examines the impact of Capital Adequacy Ratio (CAR) on Return on Assets (ROA), the

Wooldridge test for autocorrelation ($F(1,9) = 2.982$, $p = 0.1183$) shows no evidence of autocorrelation, indicating that the residuals are independent over time and the standard

errors are reliable. The Hausman test ($\chi^2(3) = 1.03$, $p = 0.7945$) suggests that the null hypothesis of consistent and efficient random effects cannot be rejected, confirming that the Random Effects model is preferable to Fixed Effects. This conclusion is further supported by the Breusch-Pagan Lagrange Multiplier test ($\text{chibar}^2(01) = 138.61$, $p = 0.0000$), which demonstrates significant unobserved bank-specific heterogeneity, making Random Effects more suitable than pooled OLS. However, Pesaran's test for cross-sectional dependence (4.160, $p = 0.0000$) indicates that tremors affecting one bank are likely to influence others, reflecting the interconnected nature of the banking sector. The Modified Wald test for groupwise heteroskedasticity ($\chi^2(10) = 1442.23$, $p = 0.0000$) confirms that the variance of errors differs across banks, necessitating the use of robust standard errors.

Model 2: Return on Equity (ROE)

Similarly, for Model 2, which examines ROE as the dependent variable, the Wooldridge test ($F(1,9) = 1.309$, $p = 0.2821$) shows no autocorrelation, while the Modified Wald

test ($\chi^2(10) = 4550.52$, $p = 0.0000$) again confirms heteroskedasticity. The Hausman test ($\chi^2(3) = 1.86$, $p = 0.6025$) favors Random Effects over Fixed Effects, and the Breusch-Pagan LM test ($\text{chibar}^2(01) = 103.03$, $p = 0.0000$) indicates that bank-specific effects are significant, justifying the use of Random Effects instead of pooled OLS. Pesaran's test (5.377, $p = 0.0000$) shows cross-sectional dependence among banks, suggesting that external sector-wide factors may simultaneously affect bank performance.

So, for the two models (i.e ROA and ROE), the diagnostic tests across both models confirm that Random Effects panel regression with robust standard errors is the most appropriate estimation technique so as to account for heteroskedasticity and cross-sectional dependence, while ensuring the reliability of the estimated relationships between CAR, control variables, and bank financial performance.

Hypotheses Testing

H₀₁: Capital Adequacy Ratio has no significant effect on Return on Assets of quoted Deposit Money Banks in Nigeria.

Table 6: Random Effects Regression of ROA on Capital Adequacy with Clustered Robust Standard Errors

R-sq:					Numbers of Obs		101
Within	0.2869				Number of groups		10
Between	0.5827				Obs per group:		
Overall	0.4792				Min		8
					Avg		10.1
					Max		11
					Wald chi2(4)		11.03
					Prob > chi2		0.0116
(Std. Err. adjusted for 10 clusters in Bank)							
ROA	Coefficient	Robust Std. Error	z-value	p-value		95% Confidence Interval	
CAR	0.0434	0.0336	1.29	0.196		[-0.0224, 0.1091]	
FSIZE	0.5809	0.1753	3.31	0.001		[0.2373, 0.9245]	
LEV	-7.5411	6.1375	-1.23	0.219		[-19.5704, 4.4882]	
_cons	-0.9774	5.2124	-0.19	0.851		[-11.1935, 9.2387]	
sigma_u	0.7424						
sigma_e	0.5759						
Rho		0.6243 (fraction of variance due to u_i)					

Source: Researcher's Computation, (2026)

Table 6 model has an overall R-squared of 0.4792, indicating that approximately 48% of the variation in ROA across banks and years is explained by the independent variables. The Wald chi-square ($\chi^2 = 11.03$, $p = 0.0116 < 0.05$) shows that the model is statistically significant at the 0.05 (i.e. 5%) significant level.

Also, regarding the hypothesis one (H₀₁), CAR has a positive coefficient of 0.0434 but is not statistically significant ($z = 1.29$, $p = 0.196 > 0.05$), suggesting that capital adequacy does not have a significant effect on ROA in this sample. FSIZE is positively significant ($\beta = 0.5809$, $p = 0.001$), indicating that larger banks tend to achieve higher ROA, while LEV is negative but not significant ($\beta = -7.5411$, $p = 0.219$). The

variance components indicate that $\text{sigma}_u = 0.7424$ and $\text{sigma}_e = 0.5759$, with $\text{Rho} = 0.6243$, showing that approximately 62.4% of the total variance in ROA is attributable to differences between banks, while the remaining 37.6% is due to within-bank variation over time.

Overall, the results fail to reject the null hypothesis (H₀₁) that Capital Adequacy Ratio has no significant effect on ROA of quoted deposit money banks in Nigeria, highlighting that while CAR may provide regulatory stability, it does not directly translate into improved asset profitability for these deposit money banks.

H₀₂: Capital Adequacy Ratio has no significant effect on Return on Equity of quoted Deposit Money Banks in Nigeria.

Table 7: Random Effects Regression of Return on Equity on Capital Adequacy with Clustered Robust Standard Errors

R-sq:					Numbers of Obs	101
Within	0.5000				Number of groups	10
Between	0.3593				Obs per group:	
Overall	0.4155				Min	8
					Avg	10.1
					Max	11
					Wald chi2(4)	46.46
					Prob > chi2	0.0000
(Std. Err. adjusted for 10 clusters in Bank)						
ROE	Coefficient	Robust Error	Std.	z-value	p-value	95% Confidence Interval
CAR	0.0283	0.1524		0.19	0.853	[-0.2705, 0.3271]
FSIZE	6.6821	1.0034		6.66	0.000	[4.7154, 8.6488]
LEV	-5.9450	12.7797		-0.47	0.642	[-30.9927, 19.1027]
_cons	-81.2318	16.1153		-5.04	0.000	[-112.8171, -49.6464]
sigma_u	4.7239					
sigma_e	4.2374					
Rho	0.5541 (fraction of variance due to u_i)					

Source: *Researcher's Computation, (2026)*

The model analysis in table 7 exhibits a within R-squared of 0.5000, indicating that 50% of the variation in ROE within banks over time is explained by CAR, FSIZE, and LEV. The between R-squared of 0.3593 suggests that 35.9% of the variation in ROE across banks is accounted for by the model, while the overall R-squared of 0.4155 indicates that approximately 41.6% of the total variation in ROE across both time and banks is explained by the explanatory variables. The Wald chi-square statistic of 46.46 with a probability value of 0.0000 confirms that the model is statistically significant, demonstrating that the combined effect of CAR, FSIZE, and LEV on ROE is meaningful.

Individually, CAR has a positive coefficient of 0.0283, suggesting that a 1 unit increase in CAR is associated with a 0.0283 increase in ROE, holding other variables constant. However, this effect is not statistically significant ($p = 0.853$), and the 95% confidence interval [-0.2705, 0.3271] includes zero, indicating that changes in capital adequacy do not significantly influence shareholder returns among the sampled banks. Firm Size (FSIZE), on the other hand, demonstrates a strong positive and statistically significant relationship with ROE (coefficient = 6.6821, $p = 0.000$),

implying that larger banks are more effective in generating returns for equity holders, likely due to better resource utilization, operational efficiency, and diversification advantages. Leverage (LEV) has a negative coefficient of -5.9450 but is not statistically significant ($p = 0.642$), indicating that higher debt levels do not have a meaningful effect on ROE within this sample, although the negative sign suggests a potential inverse relationship between financial risk and shareholder profitability.

The Rho value of 0.5541 shows that approximately 55.4% of the total variance in ROE is due to differences between banks, while 44.6% is due to within-bank variation over time.

That 55% of total variance is due to differences between banks. Overall, the results fail to reject H_{02} , confirming that CAR does not significantly influence ROE.

Thus, the results analysis also retained the null hypothesis (H_{02}) that Capital Adequacy Ratio has no significant effect on ROE of quoted deposit money banks in Nigeria, suggesting that while adequate capital supports regulatory compliance, it does not directly translate into higher shareholder returns.

Table 8: Regression summary Models 1, and 2 (Pooled OLS, Fixed Effect, Random Effect)

Model 1: ROA			
Variable	Pool OLS (ROA)	Fixed Effects (FE ROA)	Random Effects (RE ROA)
CAR	0.0405	0.0419	0.0434
FSIZE	0.6618 ***	0.5620 *	0.5809 ***
LEV	-12.4811 ***	-6.8591	-7.5411
_cons	2.2413	-1.2672	-0.9774
Chi²	—	—	11.0297
Df	—	—	—
N	101	101	101
R²	0.4886	0.2872	—
Model 2 ROE			
Variable	Pool OLS (ROE)	FE (ROE)	RE (ROE)
CAR	0.0581	0.0176	0.0283
FSIZE	6.0767 ***	6.6988 ***	6.6821 ***
LEV	-33.3114	-1.1023	-5.9450
_cons	-47.9647 *	-85.5496 ***	-81.2318 ***
Chi²	—	—	46.4626
Df	—	—	—
N	101	101	101
R²	0.4382	0.5006	—

Source: Researcher's Computation, (2026) **Legend:** * p<0.05, ** p<0.01, *** p<0.001,

Table 8 presents a comprehensive summary of the regression results for Models 1 and 2, using pooled OLS, Fixed Effects (FE), and Random Effects (RE) estimations.

Model 1 (ROA)

For Model 1 (ROA), the coefficient of Capital Adequacy Ratio (CAR) is consistently positive across all three specifications, with values of 0.0405, 0.0419, and 0.0434 for pooled OLS, FE, and RE respectively, indicating that higher capital adequacy tends to be associated with better asset profitability, although as observed earlier in the Random Effects model, this relationship is not statistically significant. Firm Size (FSIZE) exhibits a positive and statistically significant effect on ROA across the pooled OLS and RE models, with coefficients of 0.6618 and 0.5809, respectively, suggesting that larger banks are more efficient in converting assets into profits due to economies of scale and operational diversification. In the FE model, FSIZE remains positive (0.5620) but only marginally significant. Conversely, Leverage (LEV) has a negative coefficient across all models, most pronounced in the pooled OLS estimate (-12.4811, p<0.001), implying that excessive debt may reduce operational efficiency, though it is not significant in the RE and FE models. The constant term varies across specifications but is generally not significant, reflecting that ROA is primarily influenced by the included explanatory variables. The RE model reports a Wald chi-square of 11.03, confirming the joint significance of the variables at the 5% level, while within R-squared of 0.2872 indicates that approximately 28.7% of the variation in ROA within banks is explained by the model.

Model 2 (ROE)

For Model 2 (ROE), CAR also maintains a positive coefficient across all three specifications (0.0581 for pooled OLS, 0.0176 for FE, and 0.0283 for RE), indicating a weak positive relationship between capital adequacy and shareholder returns. However, similar to ROA, CAR's effect is not statistically significant in any specification. Firm Size (FSIZE) demonstrates a strong positive and highly significant impact on ROE across all models, with coefficients ranging from 6.0767 in pooled OLS to 6.6821 in RE, highlighting that larger banks generate higher returns for equity holders, likely due to better resource allocation and risk diversification. Leverage (LEV) shows negative coefficients in all models, most notably in pooled OLS (-33.3114), suggesting that higher debt levels may reduce shareholder returns; however, the effect is statistically insignificant in all specifications except for the constant term in pooled OLS and FE models, which is significant, indicating a baseline negative effect on ROE when other factors are zero. The RE model for ROE records a Wald chi-square of 46.46 (p<0.001), confirming that the explanatory variables jointly have a significant effect on shareholder returns. The within R-squared for FE ROE is 0.5006, suggesting that 50.1% of the variation in ROE within banks is explained by CAR, FSIZE, and LEV.

In general, the regression summary across both models indicates that Firm Size (FSIZE) consistently and positively influences both ROA and ROE, highlighting the importance of scale in banking performance. CAR, although positive, does not have a statistically significant effect on either ROA or ROE, suggesting that while capital adequacy ensures

regulatory compliance and risk absorption, it does not directly translate into higher profitability or shareholder returns in the sampled Nigerian deposit money banks. Leverage (LEV) exhibits negative coefficients, implying a potential inverse relationship with bank performance, but it remains statistically insignificant, indicating that variations in debt levels do not meaningfully affect profitability within the study period. The comparison across pooled OLS, Fixed and Random Effect models underscores that the Random Effects specification is appropriate which is inconsistent with diagnostic tests.

Discussion of Findings

The study investigated the impact of Capital Adequacy Ratio (CAR) on the financial profitability of quoted deposit money banks in Nigeria, measured by Return on Assets (ROA) and Return on Equity (ROE), while controlling for firm size (FSIZE) and leverage (LEV). The panel dataset was unbalanced, spanning 10 banks over 2014–2024, providing sufficient cross-sectional and temporal variation for robust analysis.

The correlation results in Table 4 revealed a strong positive correlation between ROA and ROE ($r = 0.8594$, $p < 0.01$), indicating that banks efficient in utilizing assets also deliver higher returns to equity holders. ROA correlated positively with CAR ($r = 0.5095$, $p < 0.01$) and FSIZE ($r = 0.4421$, $p < 0.01$), while negatively with LEV ($r = -0.4567$, $p < 0.01$). ROE, however, was more strongly influenced by FSIZE ($r = 0.6344$, $p < 0.01$), while CAR and LEV had weaker correlations, suggesting that capital adequacy may affect operational efficiency more than equity returns. Multicollinearity was not an issue, as VIF values in Table 4.2 were well below the threshold of 10, ensuring reliable estimation.

Panel diagnostic tests in Table 5 showed that both models are free from autocorrelation with Wooldridge tests p value > 0.05) and that Random Effects estimation is preferred over Fixed Effect (Hausman tests $p > 0.05$). However, the presence of cross-sectional dependence (Pesaran's test $p < 0.01$) and groupwise heteroskedasticity (Modified Wald test $p < 0.01$) necessitated the use of clustered robust standard errors for unbiased and efficient coefficient estimation.

Analysis of Hypothesis One (H₀₁)

In addition, analysis of Hypothesis One (H₀₁) in presented in Table 6 posited that CAR has no significant effect on ROA. The analysis revealed that CAR had a positive coefficient ($\beta = 0.0434$) but was not statistically significant ($p = 0.196 > 0.05$), indicating that, within this sample, capital adequacy does not have a discernible impact on asset profitability. The model explained approximately 48% of the variation in ROA across banks and years ($R^2 = 0.4792$), and the Wald chi-square statistic ($\chi^2 = 11.03$, $p = 0.0116$) confirmed the model's overall significance. This finding is consistent with the study by Khairi et al. (2024), who

observed that while CAR contributes to overall bank performance, its isolated effect on ROA was statistically insignificant, highlighting the importance of complementary profitability drivers such as equity returns and operational efficiency. However, the present findings contrast with Wanjiru et al. (2024) who found that CAR had a statistically significant positive effect on financial performance in Kenyan banks, suggesting that adequate capital buffers enhance profitability and stability. Similarly, Ahmed and Haruna (2023) reported that CAR significantly improved ROA among Nigerian banks, indicating that strong capitalization can directly support operational efficiency when combined with effective risk management. The divergence between these findings and the current study may be attributed to due to differences in bank use and their strategies.

Analysis of Hypothesis Two (H₀₂)

H₀₂ examined the effect of CAR on ROE, with the results indicating a positive coefficient ($\beta = 0.0283$) but statistical insignificance ($p = 0.853 > 0.05$). The model explained approximately 41.6% of the variation in ROE (overall $R^2 = 0.4155$), with significant between- and within-bank variations reflected in the Rho value (0.5541). These findings suggest that while CAR ensures regulatory compliance and may promote stability, it does not directly drive shareholder returns in the sampled Nigerian deposit money banks. This is also partially supported by Khairi et al. (2024) and Obiedallah and Abdelaziz (2024), who observed that CAR's influence on profitability and equity returns is often mediated by other operational or financial inclusion factors. Conversely, studies such as Ihejirika et al. (2024) and Abonyi and Ogbada (2025) reported a positive and statistically significant effect of CAR on ROE in Nigerian banks, highlighting that strong capitalization do enhances shareholders' value and investor confidence.

Across both ROA and ROE performance measures, Firm Size (FSIZE) consistently demonstrated a strong positive and statistically significant relationship with ROA and ROE ($\beta = 0.5809$, $p = 0.001 < 0.05$ for ROA and $\beta = 6.6821$, $p = 0.000 < 0.05$ for ROE), indicating that larger banks tend to achieve superior profitability and equity returns. This result is consistent with Wanjiru et al. (2024), Ahmed and Haruna (2023), and Abonyi and Ogbada (2025), who reported that firm size significantly improves bank profitability.

Leverage (LEV), on the other hand, showed a negative but statistically insignificant effect on both ROA ($\beta = -7.5411$, $p = 0.219$) and ROE ($\beta = -5.9450$, $p = 0.642$). Although the negative coefficients suggest that higher debt levels may reduce profitability due to increased financial risk and interest obligations but the lack of statistical significance indicates that leverage does not meaningfully influence bank performance within the sampled period. This finding simply suggests that Nigerian deposit money banks may operate within regulated leverage limits, minimizing its impact on profitability. The result aligns with Ahmed and Haruna

(2023) and Khairi et al. (2024), who found that some risk-related financial variables were not statistically significant determinants of profitability.

Conclusions

This study's findings suggest that the Capital Adequacy Ratio of quoted deposit money banks in Nigeria does not significantly impact their financial profitability in terms of Return on Assets and Return on Equity. The results are consistent and reveal that although Capital Adequacy Ratio is favourably associated to profitability, but the relationship is statistically insignificant. This confirms that regulatory capital alone is not a direct driver of bank performance. In contrast, the size of the bank is a major factor of both ROA and ROE. This implies that larger banks benefit from economies of scale, diversified operations and better management of assets and equity. Leverage was inversely connected to profitability but was not statistically significant. The study generally shows that operational efficiency and strategic growth are more important to the profitability of Nigerian deposit money banks than the capital adequacy.

Recommendations

Based on the findings and conclusion of the study, the following recommendation were bring up;

1. Deposit Money Banks should not only maintain adequate capital levels for regulatory compliance but also ensure that capital is efficiently deployed into productive, income-generating assets to enhance profitability.
2. Banks should pursue sustainable growth strategies such as branch expansion, digital banking development, and service diversification, as firm size was found to significantly improve financial performance.
3. Management should focus on cost control, risk management, and innovation to maximize returns on assets and equity, since profitability appears more influenced by operational strength than by capital levels alone.
4. Although leverage was not significant, but banks should avoid excessive borrowing and maintain balanced capital structures to minimize financial risk and ensure long-term stability.

References

1. Abonyi, K. G., & Eyong Ikwa Ogbada, E. (2025). Capital adequacy and firm performance of listed money deposit banks in Nigeria. *IIARD International Journal of Banking and Finance Research*, 11(8), 100–116. <https://doi.org/10.56201/ijbfr.vol.11.no8.2025.pg100-116>
2. Adeola, O., & Afolabi, O. (2023). Capital regulation and bank performance in Nigeria: The moderating role of macroeconomic variables. *Journal of African Business and Economics*, 9(2), 291–307. <https://doi.org/10.1080/21581344.2023.2186698>
3. Adusei, M. A., & Osei, K. A. (2023). Liquidity management and profitability of banks: Evidence from West Africa. *Journal of Financial Stability*, 64, Article 101225. <https://doi.org/10.1016/j.jfs.2023.101225>
4. Ahmed, A. A. I., & Aris, H. M. (2025). *Effect of capital adequacy, foreign exchange rate, and operational risks on financial performance of selected listed deposit money banks in Nigeria*. UMM Journal of Accounting and Financial Management, 5(1), 54–84. <https://journals.umm.edu.ng/index.php/ummjafm/article/download/96/36/400>
5. Akande, J. O. (2025). *Effect of capital adequacy and liquidity management on financial performance of listed deposit money banks in Nigeria*. Gusau Journal of Accounting and Finance, 6(1), 108–121. <https://journals.gujaf.com.ng/index.php/gujaf/article/view/371/212>
6. Alhaji, M. A., & Bala, H. (2023). Performance metrics and shareholder value in commercial banks: Evidence from Nigeria. *International Journal of Banking and Finance*, 12(3), 45–61. https://www.ijbfn.net.com/journals/Vol_12_No_3_December_2023/5.pdf
7. Alkhazali, O., Helmi, M. H., Mirzaei, A., & Saad, M. (2024). The impact of capital on bank profitability during the COVID-19 pandemic. *Global Finance Journal*, 62, 100994. <https://doi.org/10.1016/j.gfj.2024.100994>
8. All-Africa. (2025). *Nigeria banking sector strengthens as capital adequacy ratio hits 15.20%*. Making Finance Work for Africa. <https://www.mfw4a.org/news/nigeria-banking-sector-strengthens-capital-adequacy-ratio-hits-152-percent-liquidity-4906>
9. Central Bank of Nigeria. (2023). *Regulatory capital requirements and prudential standards for deposit money banks in Nigeria*. CBN Publication.
10. All-Africa. (2025). *Nigeria banking sector strengthens as capital adequacy ratio hits 15.20%*. Making Finance Work for Africa. <https://www.mfw4a.org/news/nigeria-banking-sector-strengthens-capital-adequacy-ratio-hits-152-percent-liquidity-4906>
11. Central Bank of Nigeria. (2023). *Regulatory capital requirements and prudential standards for deposit money banks in Nigeria*. CBN Publication.
12. Festus, A. F., Oyeyemi, O. G., & Kameel, A. K. (2025). *Capital adequacy and financial performance of listed deposit money banks in selected Sub-Sahara African countries*. *International Journal of*

- Accounting, Finance and Risk Management*, 10(3), 121–136.
<https://article.sciencepublishinggroup.com/pdf/j.ijafmr.20251003.11>
13. Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2022). *Multivariate data analysis* (9th ed.). Cengage Learning.
 14. Ibrahim, M., & Oladipo, A. (2024). Capital adequacy and strategic risk-taking behaviour among African banks: Evidence from panel data analysis. *International Journal of Banking and Finance Studies*, 12(1), 54–71.
<https://ijbfs.org/index.php/ijbfs/article/view/301>
 15. Ihejirika, P. O., Ojiegbe, J. N., & Ihejiamaizu, P. A. (2024). Capital adequacy and return on equity of deposit money banks in Nigeria. *IIARD International Journal of Banking and Finance Research*, 10(2), 143–155.
<https://doi.org/10.56201/ijbfr.v10.no2.2024.pg143.155>
 16. Isitoah, A. P., & Onuorah, A. C. (2025). Effect of bank's financial resilience predictors on economic stability in Nigeria. *IIARD International Journal of Banking and Finance Research*, 11(2), 156–173.
<https://iiardjournals.org/get/IJBFR/VOL.%2011%20N.O.%202%202025/Effect%20Of%20Banks%20Financial%20156-173.pdf>
 17. Khairi, M. R., Atika, & Rahmani, N. A. B. (2024). *The effect of return on equity, capital adequacy ratio and financing to deposit ratio on ROA of PT Bank Muamalat Tbk*. *Ilomata International Journal of Management*, 5(4), 1154–1172.
<https://www.ilomata.org/index.php/ijjm/article/view/1274>
 18. Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 28(4), 911–922.
<https://doi.org/10.2307/2978343>
 19. Maveric (2023). *Key regulatory bodies in the banking industry: Their roles and responsibilities*. Maveric Systems.
<https://www.mavericsystems.com/article/key-regulatory-bodies-in-banking>
 20. Mensah, L. K., & Adu, G. (2023). Interest rate dynamics and bank profitability: Evidence from a multi-country study. *International Journal of Bank Marketing*, 41(3), 657–678.
<https://doi.org/10.1108/IJBM-06-2022-0381>
 21. Nwachukwu, N., Omeihe, K., & Ogbechie, C. (2023). Risk management, capital buffers, and bank performance in emerging markets. *Journal of Financial Regulation and Compliance*, 31(4), 499–516.
<https://doi.org/10.1108/JFRC-03-2023-0037>
 22. Obadimu, G. A., & Oboh, C. S. (2025). Impact of Banking Regulation and Supervision on the Financial Performance of Listed Deposit Money Banks in Nigeria. *Covenant Journal of Business and Social Sciences*, 15(1), 17. Retrieved from <https://journals.covenantuniversity.edu.ng/index.php/cjbss/article/view/4899>
 23. Obiedallah, Y. R., & Abdelaziz, A. H. (2024). *Financial inclusion and financial performance: The interplay role of capital adequacy requirements in Egyptian banks*. *Future Business Journal*, 10, Article 96.
<https://link.springer.com/content/pdf/10.1186/s43093-024-00383-9.pdf>
 24. Ogbonna, G. N., & Appah, E. (2022). Risk exposure and bank performance in Nigeria: Evidence from post-regulatory reforms. *International Journal of Financial Studies*, 10(1), 58.
<https://www.mdpi.com/2227-7072/10/1/58>
 25. Oke, B., & Ikpesu, F. (2022). Capital adequacy, asset quality and banking sector performance in Nigeria. *Acta Universitatis Danubius (Economica)*, 18(5), 37–46.
<https://dj.univ-danubius.ro/index.php/AUDOE/article/view/1843>
 26. Okoye, A. U., & Ezeani, E. J. (2025). Capital buffer, credit risk, and profitability of listed Nigerian banks. *Nigerian Journal of Banking and Finance*, 15(1), 102–119.
 27. Okwudili, K. O., Musa, S. J., Ofili, M., & Paul, S. O. (2025). Capital adequacy and financial growth of listed deposit money banks in Nigeria. *Educational Administration: Theory and Practice*, 31(1), 827–841.
<https://kuey.net/index.php/kuey/article/download/10633/8336/19941>
 28. Omankhanlen, A. E., Oni, A. O., & Olugbenga, E. O. (2022). Profitability and risk efficiency of commercial banks in Nigeria: A performance assessment. *African Journal of Economic and Management Studies*, 13(4), 497–513.
<https://www.emerald.com/insight/content/doi/10.1108/AJEMS-03-2022-0102/full/html>
 29. Patel, K., & Kanchan, P. (2024). *Impact of capital adequacy ratio on operating performance, profitability and return ratio: A comparison between selected public and private sector banks in India*. *VIDYA - A Journal of Gujarat University*, 3(2), 98–108.
<https://vidyajournal.org/index.php/vidya/article/view/415/200>
 30. Pratomo, W. A., Warokka, A., Yudaruddin, R., & Aqmar, A. Z. (2025). Economic Freedom and Banking Performance: Capital Buffers as the Key to Profitability and Stability in Liberalized Markets. *Journal of Risk and Financial Management*, 18(10), 544.
<https://doi.org/10.3390/jrfm18100544>
 31. Reuters. (2024, March 28). *Nigeria's central bank sets minimum capital base for banks*.
<https://www.reuters.com/world/africa/nigerias-central-bank-sets-minimum-capital-base-banks-2024-03-28/>

32. Samir D.C. (2024). Effect of capital adequacy ratio, non-performing loan, base rate, spread rate and loan to deposit ratio on profitability of Nepalese commercial banks. *Nepalese Journal of Economics*, 8(4), 22–40. <https://www.nepjol.info/index.php/nje2/article/download/79746/61053/229205>
33. Sekaran, U., & Bougie, R. (2022). *Research methods for business: A skill-building approach* (8th ed.). Wiley.
34. Success, B. E., Musa, S. J. & Ibrahim, K. M. (2024). CAPITAL ADEQUACY AND FINANCIAL GROWTH OF LISTED DEPOSIT MONEY BANKS IN NIGERIA. *IRASS Journal of Multidisciplinary Studies*, 1(2), 55-65. <https://irasspublisher.com/assets/articles/1755834619.pdf>
35. Tarawneh, M., & Elayan, O. (2024). *Baseline capital standards and bank performance: A comparative study under Basel III regimes*. *Journal of International Financial Markets, Institutions & Money*, 85, Article 102108. <https://doi.org/10.1016/j.intfin.2024.102108>
36. Uzonwanne, G. N., & Eze, S. C. (2024). Capital adequacy and financial performance of Nigerian deposit money banks: A panel data analysis (2015–2022). *African Journal of Economic Review*, 12(1), 47–63. <https://africaneconomicreview.org/index.php/ajer/article/view/707>
37. Wanjiru, B. N., Jagongo, A. O., & Ndede, F. W. S. (2024). *Effect of capital adequacy on financial performance of commercial banks in Kenya*. *Strategic Journal of Business & Change Management*, 11(2), 327–349. <https://strategicjournals.com/index.php/journal/article/view/2913/2759>