CORPORATE RISK MANAGEMENT AND PERFORMANCE OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study investigates the effect of corporate risk management on the performance of listed deposit money banks (DMBs) in Nigeria from 2013 to 2024, focusing on capital adequacy risk management (CARM) and non-performing loan risk management (NPLRM). Adopting an ex-post facto design and employing panel estimated generalised least squares (PEGLS) estimation, the study analyses secondary data from banks' annual reports, the Central Bank of Nigeria (CBN), and the Nigeria Deposit Insurance Corporation (NDIC) publications. The results show that CARM has a positive and significant impact on return on assets (ROA), indicating that stronger capital buffers improve financial stability and profitability. In contrast, NPLRM exerts a negative and significant effect on ROA, revealing that poor asset quality reduces earnings and weakens resilience. The study concludes that sound corporate risk management is essential for enhancing bank performance and recommends prioritising capital adequacy and proactive strategies to reduce non-performing loans and safeguard bank sustainability.

Keywords: *Returns on Assets, Risk Management, Capital Adequacy, Deposit Insurance*

Introduction

The global banking system is a critical pillar of the world economy, facilitating financial intermediation, capital allocation, international trade, and growth across emerging markets (Amakor & Bennee, 2025). By mobilizing savings from surplus units and channelling funds to deficit units, banks promote investment, entrepreneurship, and financial inclusion, strengthening stability (Bavoso, 2022). Despite these contributions, banking remains exposed to operational drawbacks, including financial and non-financial risks arising from maturity transformation, leverage, regulatory complexity, and interconnectedness, which manifest in credit, liquidity, market, and operational risks that undermine performance if not effectively managed (Bavoso, 2022). Risk is mitigated through systematic acceptance and control (Newstyle, Isele, & Tekerebo, 2024; Edor, 2022).

Kanene and Francis (2023) highlight the role of corporate risk management in identifying, assessing, and mitigating threats to financial performance and

corporate reputation, while Tukur (2023) emphasizes its function in anticipating risks, ensuring compliance, and maintaining stability in dynamic financial environments. Abubakar, Ibrahim, Zakaria, and Kassim (2023) stress its governance dimension by embedding risk assessment into strategic decision-making, Musa, Moses, and Success (2022) underscore its role in enhancing resilience against financial shocks, Kaplan and Mikes (2012) focus on procedural controls, and Lam (2014) highlights enterprise-wide alignment with strategy. In banks, capital adequacy ratio (CAR) and non-performing loan ratio (NPLR) are key proxies, with CAR reflecting loss-absorption capacity and financial stability (Bunea, 2019; Obayagbona & Osagiede, 2023), while high NPLs erode profitability, weaken asset quality, and undermine resilience (Addy et al., 2024).

Firm performance, in this context, is measured by return on assets (ROA), which indicates a bank's efficiency in utilising its total assets to generate net income. ROA serves as a widely accepted profitability metric in banking studies, reflecting both operational efficiency and financial sustainability (Yusuf, 2020; Kolawole, Igbekoyi, Ogungbade, & Dagunduro, 2023). A higher ROA implies that banks are effectively converting assets into earnings, whereas a lower ROA suggests inefficiencies in asset utilisation or heightened exposure to risks.

Financial Distress Theory (Altman, 1968) highlights that declining financial health, characterised by high leverage, weak capital, or rising non-performing loans (NPLs), can undermine firm value and profitability (Kaplan & Mikes, 2012; Whitaker, 1999; Brédart, 2014). In the banking sector, effective capital adequacy (CARM) and non-performing loan management (NPLRM) are essential for stability, solvency, and sustained performance (CBN, 2021; NDIC, 2023; Bunea, 2019; Obayagbona & Osagiede, 2023; Addy et al., 2024). Empirical evidence from Nigerian deposit money banks shows that both CARM and NPLRM significantly influence financial outcomes, underscoring the importance of governance and risk management strategies (Inegbedion & Ohiokha, 2025; Falade et al., 2024; Olowookere & Adeyemi, 2025).

In Nigeria, the relevance of CRM has grown amidst recurrent banking crises, consolidation reforms, and the aftermath of global disruptions such as the COVID-19 pandemic. Credit and liquidity risks remain the most significant threats to financial stability, with persistent challenges of weak asset quality and inadequate capital buffers (Omobolade, Seriki, & Olowookere, 2020; Adeniran, Efunniyi, Osundare, & Abhulimen, 2024). Despite regulatory reforms, such as the 2005 consolidation policy and the adoption of Basel III in 2013, risk-related vulnerabilities persist, threatening profitability and investor confidence.

Against this backdrop, investigating the effect of corporate risk management (CAR and NPLR) on the performance (ROA) of listed deposit money banks in Nigeria is both timely and relevant. This study provides empirical insights that can guide

bank management, regulators, and policymakers in strengthening risk governance frameworks, enhancing profitability, and ensuring long-term resilience in the Nigerian banking sector

Statement of the Problem

The stability and performance of the banking sector are central to global economic functioning, with banks intermediating vast sums of global banking revenues after risk costs reached approximately $5.5 trillion in 2024, and funds intermediated by the banking system grew faster than global GDP between 2019 and 2024, underscoring their systemic economic role and vulnerability to risk (Rabea, 2025). Despite this critical role, banks worldwide face persistent risks from inadequate capital buffers and credit quality challenges; the global non-performing loan (NPL) ratio stood at around 3.2% in 2023, even as average capital adequacy ratios hovered near 14.5%, highlighting ongoing risk exposure that can threaten profitability and solvency (Arhinful, Mensah, Gyamfi, & Obeng, 2025).

In Nigeria, Deposit Money Banks (DMBs) are pivotal for capital allocation, financial inclusion, and growth (Falade et al., 2024; Olowookere & Adeyemi, 2025), yet the sector has historically suffered systemic distress from weak capital bases and elevated NPLs, leading to bank failures and costly interventions (Muhammad, Tukur, Dabari, & Hanga, 2023). Although aggregate NPL ratios declined to 4.1% by June 2023, below prudential benchmarks (NDIC, 2023), concerns persist over cyclical shocks, asset quality deterioration, and capital volatility in a fragile macroeconomic environment (Igbru, Ikilidih, & Agari, 2023; Chukwu, Muritala, Akande, & Adekunle, 2024).

Empirical evidence on the nexus between corporate risk management indicators, particularly capital adequacy ratio management (CARM) and non-performing loan ratio management (NPLRM), and financial performance in Nigerian DMBs remains mixed. Some studies show that adequate capital buffers enhance profitability and stability (Edor, 2022; Natufe & Evbayiro-Osagie, 2023; Falade et al., 2024), while others find that excessive capitalisation can reduce profit efficiency (Musa et al., 2022; Orjinta & Ighosewe, 2022), and some report no significant impact (Babatunde et al., 2023). High NPL ratios are generally linked to diminished profitability (Ugah, 2021; Khalid, Wala, Neimat, Yousif, Ibrahim, & Adel, 2021), though effective loan-recovery strategies may mitigate adverse effects (Babatunde, 2023; Kumshe, Umar, & Modibbo, 2024). Prior research often examines risk factors in isolation and lacks methodological rigor in addressing panel data concerns like endogeneity and heteroskedasticity, limiting the validity of findings (Inegbedion & Ohiokha, 2025; Orjinta & Ighosewe, 2022).

These gaps underscore the need for an integrated, context-specific, and methodologically robust assessment of how CARM and NPLRM, as core dimensions of corporate risk management, jointly influence the performance of listed Nigerian DMBs. Addressing this gap is crucial for

reconciling conflicting evidence, strengthening risk governance, and informing regulatory and managerial strategies to enhance banking sector resilience, profitability, and competitiveness.

Research Questions

Arising from the statement of the research problem are the following research questions:

i. What is the effect of capital adequacy ratio risk management on the performance of deposit money banks in Nigeria?
ii. What is the effect of non-performing loan risk management on the performance of deposit money banks in Nigeria?

Research Objectives

The specific objectives of this study are to:

i. examine the effect of capital adequacy ratio risk management on the performance of deposit money banks in Nigeria,
ii. investigate the effect of non-performing loan risk management on the performance of deposit money banks in Nigeria.

Literature Review

Bank Performance

Bank performance refers to the extent to which an organisation achieves its financial and operational objectives, reflecting its efficiency in utilising resources to generate returns (Farah et al., 2016). It is a multidimensional construct that captures profitability, growth, and value creation, often measured using accounting-based, market-based, or mixed indicators (Omaliko, Mordi, & Uzodimma, 2023).

Among these, Return on Assets (ROA) is one of the most widely used indicators of bank performance. ROA measures a company's profitability relative to its total assets, showing how effectively management uses assets to generate earnings (Kolawole et al., 2023). It is calculated as net income divided by total assets. A higher ROA suggests greater efficiency in converting assets into profits, making it a vital tool for comparing firms across industries and assessing managerial effectiveness (Yusuf, 2020).

Empirical studies consistently adopt ROA as a robust proxy for bank performance because it reflects both profitability and asset utilisation. Omaliko et al. (2023) note that ROA not only captures the outcome of core banking operations but also serves as a reliable benchmark for evaluating the financial health and competitiveness in the banking sector, where asset management is central. In this study, ROA is employed as the primary measure of bank performance because it indicates how efficiently banks deploy their assets to generate sustainable profits while maintaining financial stability.

Corporate Risk Management (CRM)

Corporate Risk Management (CRM) refers to the systematic process of identifying, assessing, prioritising, and mitigating risks that may hinder an organisation's objectives, financial performance, or reputation (Kanene & Francis, 2023). In the banking sector, safeguarding assets, complying with regulatory frameworks, and ensuring the stability of the financial system are crucial,

given the sector's inherent exposure to credit, liquidity, market, operational, and reputational risks (Tukur, 2023; Abubakar et al., 2023).

In deposit money banks, **Corporate Risk Management** focuses particularly on credit risk and capital adequacy (Kumshe et al., 2024). Credit risk, often reflected in non-performing loans (NPLs), directly affects profitability and financial resilience, while capital adequacy ensures that banks maintain sufficient buffers to absorb shocks and sustain performance under stress (Enoch, Digil, & Arabo, 2021; Addy et al., 2024). Thus, CRM goes beyond regulatory compliance, serving as a proactive framework that enhances transparency, protects stakeholders, and secures long-term financial sustainability (Oladele & Akinwumi, 2024).

Scholars such as Bitar, Hassan, and Walker (2021), Nwude and Okeke (2018), and Kolawole et al. (2023) have offered complementary perspectives on corporate risk management in the banking sector. Bitar et al. (2021) describes it as the systematic set of policies and processes designed to minimise unacceptable risks that could compromise organisational continuity and growth. Similarly, Nwude and Okeke (2018) defines it as the identification, assessment, and prioritisation of risks, coupled with the coordinated deployment of resources to mitigate, monitor, and control both the likelihood and impact of adverse events. Kolawole et al. (2023) further emphasise its dual strategic and operational role, underscoring its importance in sustaining competitiveness, stability, and stakeholder confidence within the banking sector.

Theoretical framework

This study is anchored on financial distress theory.

Finance Distress Theory

Financial Distress Theory, first advanced by Altman (1968) through the development of the Z-score model, explains how declining financial health undermines firm value, increases insolvency risk, and constrains performance. The theory posits that firms experiencing distress marked by high leverage, inadequate capital, or rising non-performing assets face reduced investor confidence, limited access to credit, and deteriorating profitability (Kaplan & Mikes, 2012).

Nevertheless, in the banking sector, distress often arises from poor asset quality and weak capital buffers, with high non-performing loan ratios eroding earnings and solvency (Whitaker, 1999; Brédart, 2014). For Nigerian deposit money banks, the theory underscores the importance of effective capital adequacy ratio management (CARM) and non-performing loan ratio management (NPLRM) to mitigate distress, enhance stability, and sustain performance (CBN, 2021; NDIC, 2023).

Empirical Review

Capital Adequacy Risk Management (CARM) and Bank Performance

Kumshe et al. (2024) examined the effect of capital adequacy ratio management (CARM) on the financial performance of Nigerian deposit money banks, measured using ROA and ROE, and, employing panel data regression analysis, found a positive

and statistically significant relationship, indicating that strong capital buffers enhance banks' capacity to absorb risk and sustain profitability. The study recommended strengthening internal capital planning and aligning capital buffers with risk exposure and concluded that effective CARM is essential for financial stability and sustainable bank performance. Building on this, Falade, Nyor, Onipe, and Agbi (2024) assessed the effect of CARM on bank performance, measured by firm value using the price-earnings ratio, and, through pooled OLS regression, reported a positive and significant impact of capital adequacy on firm value, suggesting improved market confidence and institutional stability; the study recommended maintaining strong capital positions within sound governance frameworks and concluded that CARM plays a strategic role in enhancing stability and performance.

In contrast, Edor (2022) explored the effect of capital adequacy management on bank profitability, with ROA as the dependent variable, and, using multiple regression analysis, found a positive but insignificant relationship, indicating limited direct profitability effects; the author recommended integrating capital management with broader risk governance and credit controls and concluded that CARM primarily strengthens financial resilience rather than short-term profitability. Extending the analysis to a broader context, Bunea (2019) examined the effect of regulatory capital adequacy on bank stability and performance in emerging economies and, employing cross-country panel analysis, found that higher capital ratios significantly reduce risk exposure and improve long-term performance; the study recommended enforcing Basel-aligned, risk-sensitive capital frameworks and concluded that capital adequacy underpins systemic stability and sustainable performance. More recently, Inegbedion and Ohiokha (2025) evaluated the effect of CARM on the financial performance of 13 listed Nigerian DMBs, measured using ROA, and, using panel data and PGLS, revealed a positive but insignificant effect on profitability; the authors recommended complementing capital buffers with comprehensive risk management strategies and concluded that CARM enhances stability but requires supportive governance to translate into improved performance. Similarly, Amakor and Bennee (2025) examined the impact of capital adequacy on bank performance, measured using ROE over 2005–2023, and, applying multiple regression analysis, found a positive yet insignificant relationship; the study recommended integrating capital management with robust corporate and risk governance practices and concluded that sustainable performance depends on an integrated risk–capital management framework.

Collectively, these studies indicate that while CARM contributes to financial resilience, its effect on profitability depends on measurement metrics, governance quality, and integration with broader risk management practices. Against this backdrop, the following hypothesis is raised:

H_{01}: Capital adequacy risk management has no significant effect on the performance of deposit money banks in Nigeria.

Non-Performing Loan Risk Management and Bank Performance

Globally, Empirical evidence shows that NPLs significantly undermine bank performance. Therefore, in Turkey, Ekinci and Poyraz (2019), using panel regression on banks (2005–2017), found that NPLs reduced profitability. In Pakistan, Hassan et al. (2019), employing fixed-effects on panel data (2006–2016), reported that rising NPLs increased costs and constrained lending. In Jordan, Harb, El Khoury, Mansour, and Daou (2022) applied GMM (2009–2019) and confirmed that NPLs impaired growth. In Malaysia, Khalid et al. (2021), using panel regression on 25 banks (2008–2018), showed that persistently high NPLs eroded profitability and investor confidence, raising systemic risk.

Likewise, in Nigeria, Inegbedion and Ohiokha (2025), using panel GLS on 13 listed DMBs, found that NPLs had a significant negative effect on ROA. Ogundele and Nzama (2025), applying panel regression with GMM (2012–2023) on 12 banks, reported that high NPLs reduced financial performance, though liquidity disclosure improved outcomes. Nwafor and Nworie (2025) showed, via regression analysis, that gender-diverse boards reduced NPLs, indirectly boosting profitability. Olowookere & Adeyemi (2025) also confirmed, with panel data analysis, that strong recovery mechanisms sustained higher ROA.

Collectively, evidence across contexts confirms that effective NPL management through governance, risk disclosure, and recovery strategies is crucial for profitability and stability. It is against this backdrop that the hypothesis below is highlighted:

H_{02}: Non-performing loan risk management has no significant effect on the performance of deposit money banks in Nigeria.

Methodology

This study adopts an ex-post facto research design, which is appropriate when the variables under investigation have already occurred and cannot be manipulated by the researcher (Saunders, Lewis, & Thornhill, 2019).

The study population comprises the thirteen (13) deposit money banks listed on the Nigerian Exchange Group (NGX) with consistent financial reports from 2013 to 2024, justified by their regulatory compliance, continuous disclosure requirements, and data availability, which ensure the reliability, comparability, and longitudinal consistency necessary for robust panel data analysis. Secondary data are drawn from banks' annual reports, the Central Bank of Nigeria (CBN), and the Nigeria Deposit Insurance Corporation (NDIC) publications.

The model specified for the study was adapted from the model of Ogundele and Nzama (2025), which is represented in its functional form as follows:

$$ROA = f(CRR, LQR, CRD, LRD, BAG, LEV, FSZ, GDP, INF, INR) - - - - - - - (3.I)$$

Econometrically, the regression model is transformed as follows:

$$ROAit = B0 + \beta 1CRRit + \beta 2LQRit + \beta 3CRDit + \beta 4LRDit + \beta 5BAGit + \beta 6LEVit + \beta 7BSZit + \beta 8GDPit + \beta 9INFit + \beta 10INRit + \mu it - - - - - - (3.2)$$

Where: ROAit= Return on Assets for bank i at time t (dependent variable)
CRRit= Credit Risk Ratio, LQRit = Liquidity Risk Ratio, CRDit = Credit Risk Disclosure
LRDit = Liquidity Risk Disclosure, BAGit = Bank Age, LEVit = Leverage, BSZit = Firm Size
GDPit = GDP Growth Rate, INFit = Inflation Rate,INRit = Interest Rate
B0 = intercept of the regression model; B_1, β_2, β_3, β_4, β_5, β_6, β_7, β_8, β_9 and β_{10} = the coefficients of the parameters; it = represent variables for the ith bank in period t; and μ = the error or disturbance term.

This study modified and adapted the model of Ogundele and Nzama (2025) by incorporating non-performing loan risk management (NPLRM) as an independent variable alongside capital adequacy ratio management (CARM). Return on Assets (ROA) remains the dependent variable, while Bank Size (BSIZE) is included as a control. The adapted model is stated in its econometric form as follows:

$$ROA = f(CARM, NPLRM, BSIZE) - - - - - - - - - - - - - - - - - - - (3.3)$$

$$ROA = \beta 0it + \beta 1CARMit + \beta 2NPLRMit + \beta 3BSIZEit + \mu - - - - - - - - (3.4)$$

Where the independent variables are: CARM= Capital Adequacy Risk Management, NPLRM= Non-performing Loan Risk Management.

Control Variables: BSIZE= Bank size measured as log of total assets, β_0 is the intercept, β_1–β_3 are the coefficients with expected a priori signs: β_1(+), β_2(-), β_3(+); *it* indexes banks over time, and μ is the error term.

Operationalisation of Variables

Table 1: Variable Measurement and Source

Variables	Definition	Type	Measurement by Prior Study	Apriori Sign	Source
ROA	Returns on Assets (Bank Performance)	Dependent	Net Income divided by Total Assets	Nil	Ogundele and Nzama (2025)
CARM	Capital Adequacy Risk Management	Independent	The ratio of a bank's capital to its risk-weighted assets	+	Inegbedion and Ohiokha (2025)
NPLRM	Non-Performing Loan Risk Management	Independent	Ratio of Non-Performing Loans to Total Loans	-	Olowookere and Adeyemi (2025)
BSIZE	Bank Size	Control	Log of Total Assets	+	Ogundele and Nzama (2025)

Source: Researcher's compilation (2025)

Method of Data Analysis

Panel Generalised Least Squares (PGLS) was employed to estimate the model, as it effectively accounts for heteroskedasticity and autocorrelation in panel data, providing efficient and consistent parameter estimates. Unlike Ordinary Least Squares (OLS), which assumes homoskedastic errors and no serial correlation, PGLS adjusts for variability across banks and over time, making it suitable for dynamic banking data. This approach ensures that the estimated coefficients accurately reflect the relationships between the independent variables (CARM, NPLRM, BSIZE) and the dependent variable (ROA), while mitigating potential biases arising from panel-specific disturbances.

RESULTS AND DISCUSSION

Table 2: Descriptive Statistics Estimates

	ROA	CARM	NPLRM	BSIZE
Mean	0.0177	0.0830	0.0770	9.4044
Median	0.0156	0.1198	0.0800	9.3995
Maximum	0.0562	0.5076	0.1700	10.6049
Minimum	-0.0910	-1.5475	0.0200	8.1945
Std. Dev.	0.0206	0.2298	0.0312	0.4840
Skewness	-2.4178	-4.4217	0.4041	0.1377
Kurtosis	14.0273	25.5702	3.3761	2.7648
Jarque-Bera	942.3924	3819.5170	5.1644	0.8524
Probability	0.0000	0.0000	0.0756	0.6530
Observations	156	156	156	156

Source: Researchers' computation (2025)

The descriptive statistics provide insights into the distribution and characteristics of the variables employed in the study. Bank performance, measured by return on assets (ROA), has a mean value of 0.0177, indicating that Nigerian deposit money banks (DMBs) generated, on average, about 1.8% return on their total assets during the study period. The negative minimum value (–0.0910) reflects periods of loss-making, while the maximum value (0.0562) shows that some banks achieved as high as 5.6% returns. The high kurtosis (14.0273) and significant Jarque-Bera probability (0.0000) suggest a non-normal distribution with heavy tails, likely due to extreme values in bank profitability.

Capital adequacy risk management (CARM) has a mean of 0.0830, showing that banks, on average, hold about 8.3% of capital relative to risk-weighted assets, which aligns with regulatory benchmarks. However, the negative minimum value (–1.5475) suggests instances of capital erosion in some banks, while the maximum (0.5076) indicates that some banks maintained buffers far above the average. The skewness (–4.4217) and very high kurtosis (25.5702), with a significant Jarque-Bera (p = 0.0000), reveal the presence of extreme outliers in capital ratios, likely reflecting regulatory shocks or recapitalisation episodes.

Non-performing loan risk management (NPLRM), measured as the ratio of NPLs to total loans, averaged 7.7%, with a minimum of 2% and a maximum of 17%. This indicates moderate credit risk exposure within the sector, with most banks keeping their NPL ratios below the Central Bank of Nigeria's regulatory ceiling of 10%. The skewness (0.4041) and kurtosis (3.3761) suggest a symmetric distribution with a moderate tendency toward peakedness. The Jarque-Bera probability (0.0756) indicates approximate normality, unlike ROA and CARM.

Bank size (BSIZE), captured as the logarithm of total assets, has a mean of 9.4044, reflecting relatively large balance sheets across Nigerian DMBs. The low standard deviation (0.4840) shows little variation in bank sizes compared to other variables. Both skewness (0.1377) and kurtosis (2.7648) are close to zero and three, respectively, and the Jarque-Bera test (p = 0.6530) confirms normal distribution, suggesting that bank size is well-behaved in the dataset.

Overall, the descriptive results reveal that while bank size and NPLRM are relatively stable and normally distributed, both ROA and CARM exhibit significant deviations from normality, driven by extreme values. These characteristics justify the use of robust panel estimation techniques such as PGLS to address heteroskedasticity, non-normality, and autocorrelation in the data.

Correlation Matrix

Table 3 Correlation Matrix

	ROA	CARM	NPLRM_RATIO	BSIZE
ROA	1.0000			
CARM	0.5207	1.0000		
NPLRM	-0.2882	-0.2332	1.0000	
BSIZE	0.4966	0.3542	-0.2208	1.0000

Source: Researchers' computation (2025)

The correlation analysis shows that capital adequacy risk management (CARM) is positively correlated with return on assets (ROA) (r = 0.5207), indicating that stronger capital buffers are associated with higher profitability. Bank size (BSIZE) also demonstrates a positive relationship with ROA (r = 0.4966), suggesting that larger banks benefit from scale economies that enhance performance. Conversely, non-performing loan risk management (NPLRM) is negatively correlated with ROA (r = –0.2882), reflecting that higher loan defaults undermine profitability. These relationships align with theoretical expectations that adequate capitalisation and larger size enhance stability and efficiency, while poor quality reduces earnings. Furthermore, none of the coefficients exceed 0.8, implying no multicollinearity concerns and supporting the suitability of the variables for regression analysis.

Diagnostic Test

Table 4: Diagnostic Test Estimates

Summary of Diagnostic Test				
Multi-collinearity Test (Variance Inflation Factors (VIF))				
Variable	Coefficient Variance	Uncentered VIF	Centered VIF	Decision Rule
C	0.0008	464.1808	NA	
CARM	0.0000	1.3321	1.1775	No Multicollearity
NPLRM	0.0019	7.7036	1.0825	No Multicollearity
BSIZE	0.0000	446.0316	1.1705	No Multicollearity
Breusch-Godfrey Serial Correlation LM Test:				
F-statistic	20.1201	Prob. F(2,150)	0.0000	Autocorrelation Exist
Obs*R-squared	32.9976	Prob. Chi-Square(2)	0.0000	
Heteroskedasticity Test: ARCH				
F-statistic	9.3810	Prob. F(1,153)	0.0026	Heteroskedastic
Obs*R-squared	8.9546	Prob. Chi-Square(1)	0.0028	
Ramsey RESET Test				
Specification: ROA C CARM NPLRM FSIZE				
	Value	df	Probability	
t-statistic	0.5115	151	0.6098	Correctly Specified
F-statistic	0.2616	(1, 151)	0.6098	
Likelihood ratio	0.2700	1	0.6033	

Source: **Researcher's computation (2025)**

The diagnostic tests validate the robustness of the specified regression model. The variance inflation factor (VIF) results indicate that all independent variables (CARM, NPLRM) and control variable (BSIZE) have centered VIF values well below the threshold of 10 (1.1775, 1.0825, and 1.1705, respectively), confirming the absence of multicollinearity. However, the Breusch-Godfrey LM test reveals serial correlation, with both the F-statistic (20.1201, $p < 0.01$) and $ObsR^2$ (32.9976, $p < 0.01$) being statistically significant, suggesting the presence of autocorrelation in the residuals. Similarly, the ARCH test reports significant statistics (F-statistic = 9.3810, $p = 0.0026$; $ObsR^2 = 8.9546$, $p = 0.0028$), confirming heteroskedasticity. These issues, if unaddressed, may bias standard errors and undermine the efficiency of OLS estimates. By contrast, the Ramsey RESET test ($F = 0.2616$, $p = 0.6098$) shows that the model is correctly

specified, with no evidence of omitted variable bias or functional form misspecification. Against this backdrop, the study employs panel generalised least squares (PGLS), which is particularly suited for correcting heteroskedasticity and autocorrelation in panel data, thereby ensuring efficient and consistent parameter estimates.

Panel Generalised Least Square Regression

This estimate is represented in Table 5 below

Table 5: Panel Generalised Least Squares Regression Estimates

Weighted Statistics				
R-squared	0.7809	F-statistic	33.2721	
Adjusted R-squared	0.7575	Prob(F-statistic)	0.0000	
S.E. of regression	0.0127	Durbin-Watson stat	1.3893	
Dependent Variable: ROA				
Method: Panel EGLS (Cross-section weights)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.1047	0.0161	-6.5056	0.0000
CARM	0.0372	0.0112	3.3195	0.0011
NPLRM	-0.0613	0.0209	-2.9359	0.0039
BSIZE	0.0132	0.0016	8.1523	0.0000

Source: **Researcher's computation (2025)**

The model summary shows that the Panel Estimated Generalised Least Squares (PEGLS) estimation is statistically sound, with an R-squared of 0.7809 and an adjusted R-squared of 0.7575. This indicates that about 76% of the variations in return on assets (ROA) are explained by the explanatory variables in the model. The F-statistics of 33.2721 with a probability value of 0.0000 confirm that the model is statistically significant at the 1% level, implying that the variables jointly exert a significant influence on banks' performance. The Durbin-Watson statistic of 1.3893 suggests the existence of mild positive autocorrelation, which is adequately addressed by the EGLS technique. The hypothesis is accepted or rejected at 5% level of significance.

Therefore, with respect to the individual variables, capital adequacy risk management (CARM) has a positive and statistically significant effect on ROA ($\beta = 0.0372$, $t = 3.3195$, $p = 0.0011$). This finding implies that an increase in capital adequacy enhances banks' performance. Hence, the null hypothesis that CARM has no significant effect on ROA is rejected.

The result further reveals that non-performing loan risk management (NPLRM) exerts a negative and statistically significant influence on ROA ($\beta = -0.0613$, $t = -2.9359$, $p = 0.0039$). This indicates that a higher level of non-performing loans reduces profitability, as poor asset quality diminishes banks' earnings capacity. Consequently, the null hypothesis of no significant effect of NPLRM on ROA is rejected.

Overall, the results establish that while capital adequacy enhances banks' performance, non-performing loans weaken the profitability of deposit money banks in Nigeria.

Discussion of Findings

The results from the Panel EGLS estimation indicate that capital adequacy risk management (CARM), and non-performing loan risk management (NPLRM) significantly influence the performance of Nigerian deposit money banks (DMBs), as proxied by return on assets (ROA). The model explained approximately 76% of the variations in ROA, and the joint significance of the variables was confirmed by the F-statistic, while diagnostic tests validated the robustness of the model.

The study found that CARM exerts a positive and statistically significant effect on ROA. This outcome aligns with the apriori expectation and is consistent with the financial distress theory, which posits that adequate capital buffers reduce the likelihood of distress by absorbing unexpected losses, thereby sustaining solvency and improving profitability during periods of financial stress. Empirically, this result corroborates the findings of Falade et al. (2024) and Olowookere and Adeyemi (2025), who observed a significant positive link between capital adequacy and bank performance. However, it contrasts with the findings of Inegbedion and Ohiokha (2025) and Amakor and Bennee (2025), who reported an insignificant relationship between CARM and performance, suggesting that capital management alone may not fully account for profitability unless complemented by strong governance and risk strategies. The implication is that Nigerian banks with higher capital adequacy ratios are better positioned to absorb shocks, remain solvent, and sustain profitability.

The result further shows that NPLRM exerts a negative and statistically significant effect on ROA. This aligns with the apriori expectation and is in line with financial distress theory, which posits that poor credit quality increases the likelihood of distress, reduces cash flow, and impairs profitability (Ekinci & Poyraz, 2019). Non-performing loans signal weak credit appraisal systems, deteriorating asset quality, and inefficiencies in loan recovery, thereby eroding earnings capacity and shareholder value. This finding is consistent with prior studies such as Inegbedion and Ohiokha (2025), Ogundele and Nzama (2025), and Amakor and Bennee (2025), who all reported that higher NPL ratios significantly reduce banks' profitability in Nigeria. It also supports Nwafor and Nworie (2025), who argued that governance reforms, including gender-diverse boards, mitigate credit risk and indirectly improve bank performance. Thus, effective loan portfolio management and robust recovery mechanisms remain critical for sustaining profitability.
Overall, the findings establish that capital adequacy enhances firm performance, while non-performing loans reduce profitability. This suggests that Nigerian DMBs must balance prudential capital management with aggressive credit risk monitoring to optimise performance. From both theoretical and empirical standpoints, the results emphasise

that financial resilience is best achieved when banks combine adequate capital buffers with effective governance and risk management frameworks.

Conclusion

This study examined the effect of corporate risk management, proxied by capital adequacy risk management (CARM) and non-performing loan risk management (NPLRM), on the performance of listed deposit money banks (DMBs) in Nigeria over the period 2013–2024. Using an ex-post facto research design and panel generalised least squares (PGLS) estimation, the study provided robust evidence on how risk management practices shape profitability in the Nigerian banking sector.

Conclusively, this study takes the position that effective corporate risk management is central to the performance and sustainability of Nigeria's banking sector. A strong commitment to capital adequacy and disciplined credit risk management provides a critical buffer against financial distress and supports consistent profitability. Banks that prioritize prudent capital structuring and rigorous loan quality oversight are better positioned to maintain operational stability and enhance stakeholder confidence. Consequently, sustained managerial focus on these core risk management practices is essential for building a resilient and high-performing banking industry in Nigeria.

Recommendations

Based on the analysis, the following recommendations are proposed for the listed Nigerian deposit money banks:

i. Banks should strengthen their capital adequacy positions by maintaining buffers above the regulatory minimum. This will enhance solvency, improve investor confidence, and sustain profitability during periods of financial stress. Regulators such as CBN should enforce strict compliance with Basel III requirements and encourage banks to adopt robust capital planning strategies.
ii. Banks should intensify credit risk management through stronger loan appraisal, proactive monitoring, and effective recovery mechanisms to reduce the incidence of non-performing loans. CBN and NDIC should enforce strict supervisory frameworks, including early-warning systems, to detect and mitigate deteriorating asset quality. Lower NPLs will enhance earnings, strengthen resilience, and sustain financial stability.

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Appendix 1: Regression Result

Dependent Variable: ROA
Method: Panel EGLS (Cross-section weights)
Date: 10/05/25 Time: 06:49
Sample: 2013 2024
Periods included: 12
Cross-sections included: 13
Total panel (balanced) observations: 156
Linear estimation after one-step weighting matrix

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.104673	0.016090	-6.505614	0.0000
CARM	0.037206	0.011208	3.319499	0.0011
NPLRM	-0.061348	0.020896	-2.935946	0.0039
BSIZE	0.013185	0.001617	8.152287	0.0000

Effects Specification

Cross-section fixed (dummy variables)

Weighted Statistics

R-squared	0.780936	Mean dependent var	0.038525
Adjusted R-squared	0.757464	S.D. dependent var	0.025453
S.E. of regression	0.012671	Sum squared resid	0.022477
F-statistic	33.27210	Durbin-Watson stat	1.389285
Prob(F-statistic)	0.000000		

Unweighted Statistics

R-squared	0.593969	Mean dependent var	0.017695
Sum squared resid	0.026626	Durbin-Watson stat	1.330157

Appendix 2: Data Set for the Study

COMPANIES	FYEAR	ROA	BSIZE	CARM	NPLRM
Access Bank	2013	0.0245	9.2637	0.1332	0.0691
Access Bank	2014	0.0247	9.3231	0.1318	0.0703
Access Bank	2015	0.0290	9.4135	0.1419	0.0800
Access Bank	2016	0.0253	9.5421	0.1298	0.0950
Access Bank	2017	0.0191	9.6130	0.1246	0.0800

Access Bank	2018	0.0208	9.6950	0.0990	0.0700
Access Bank	2019	0.0161	9.8541	0.0854	0.1100
Access Bank	2020	0.0145	9.9385	0.0865	0.1100
Access Bank	2021	0.0151	10.0694	0.0895	0.0900
Access Bank	2022	0.0112	10.1760	0.0821	0.0700
Access Bank	2023	0.0409	10.4305	0.1744	0.0500
Access Bank	2024	0.0285	10.5489	0.0814	0.0257
Eco Bank	2013	0.0072	9.1646	0.1072	0.0700
Eco Bank	2014	0.0162	9.2487	0.1119	0.0700
Eco Bank	2015	0.0063	9.2539	0.5076	0.0800
Eco Bank	2016	0.0032	9.2573	0.3521	0.0900
Eco Bank	2017	0.0112	9.2624	0.3711	0.0800
Eco Bank	2018	-0.0007	9.2851	0.3274	0.0700
Eco Bank	2019	0.0011	9.2991	0.3454	0.1100
Eco Bank	2020	0.0040	9.3398	0.1366	0.1100
Eco Bank	2021	0.0043	9.3936	0.1126	0.0900
Eco Bank	2022	0.0172	10.1263	0.0699	0.0700
Eco Bank	2023	0.0373	10.4285	0.1168	0.0560
Eco Bank	2024	0.0195	10.6049	0.0723	0.0800
Fidelity Bank	2013	0.0083	9.0339	0.1512	0.0700
Fidelity Bank	2014	0.0131	9.0745	0.1458	0.0700
Fidelity Bank	2015	0.0114	9.0905	0.1490	0.0800
Fidelity Bank	2016	0.0085	9.1133	0.1428	0.0900
Fidelity Bank	2017	0.0139	9.1396	0.1460	0.0800
Fidelity Bank	2018	0.0146	9.2355	0.1130	0.0700
Fidelity Bank	2019	0.0144	9.3251	0.1107	0.1100
Fidelity Bank	2020	0.0102	9.4406	0.0992	0.1100
Fidelity Bank	2021	0.0116	9.5171	0.0905	0.0900
Fidelity Bank	2022	0.0135	9.6009	0.0788	0.0700
Fidelity Bank	2023	0.0199	9.7948	0.0701	0.0500
Fidelity Bank	2024	0.0326	9.9929	0.1256	0.0200
First Bank Holding	2013	0.0236	9.5878	0.0986	0.0800
First Bank Holding	2014	0.0217	9.6378	0.1066	0.0800
First Bank Holding	2015	0.0052	9.6197	0.1389	0.0900
First Bank Holding	2016	0.0048	9.6755	0.1230	0.1100
First Bank Holding	2017	0.0104	9.7190	0.1287	0.1000
First Bank Holding	2018	0.0117	9.7458	0.0953	0.0900
First Bank Holding	2019	0.0135	9.7926	0.1066	0.1600

First Bank Holding	2020	0.0109	9.8859	0.0995	0.1600
First Bank Holding	2021	0.0024	9.8941	0.1123	0.1200
First Bank Holding	2022	0.0149	10.0244	0.0941	0.0800
First Bank Holding	2023	0.0212	10.2289	0.1031	0.0410
First Bank Holding	2024	0.0370	10.3713	0.0929	0.0600
First City Monument Bank	2013	0.0180	9.0036	0.1425	0.0700
First City Monument Bank	2014	0.0205	9.0680	0.1371	0.0700
First City Monument Bank	2015	0.0067	9.0643	0.1400	0.0800
First City Monument Bank	2016	0.0139	9.0692	0.1519	0.0900
First City Monument Bank	2017	0.0090	9.0742	0.1580	0.0800
First City Monument Bank	2018	0.0129	9.1557	0.1282	0.0700
First City Monument Bank	2019	0.0121	9.2223	0.1203	0.1100
First City Monument Bank	2020	0.0106	9.3135	0.1103	0.1100
First City Monument Bank	2021	0.0091	9.3968	0.0978	0.0900
First City Monument Bank	2022	0.0123	9.4747	0.0925	0.0700
First City Monument Bank	2023	0.0217	9.6445	0.1045	0.0320
First City Monument Bank	2024	0.0250	9.7099	0.1259	0.0400
Guaranty Trust Bank	2013	0.0329	9.3228	0.1580	0.0500
Guaranty Trust Bank	2014	0.0401	9.3722	0.1548	0.0500
Guaranty Trust Bank	2015	0.0394	9.4022	0.1638	0.0500
Guaranty Trust Bank	2016	0.0416	9.4937	0.1610	0.0500
Guaranty Trust Bank	2017	0.0501	9.5252	0.1848	0.0500
Guaranty Trust Bank	2018	0.0562	9.5168	0.1751	0.0500
Guaranty Trust Bank	2019	0.0524	9.5751	0.1829	0.0700
Guaranty Trust Bank	2020	0.0407	9.6941	0.1647	0.0700
Guaranty Trust Bank	2021	0.0322	9.7353	0.1625	0.0600
Guaranty Trust Bank	2022	0.0262	9.8093	0.1444	0.0400
Guaranty Trust Bank	2023	0.0557	9.9864	0.1524	0.0290
Guaranty Trust Bank	2024	0.0449	10.1329	0.1367	0.0200
Stanbic Ibtc Holding	2013	0.0323	8.8826	0.1280	0.0700
Stanbic Ibtc Holding	2014	0.0461	8.9752	0.1273	0.0700
Stanbic Ibtc Holding	2015	0.0252	8.9720	0.1376	0.0800
Stanbic Ibtc Holding	2016	0.0353	9.0226	0.1336	0.0900
Stanbic Ibtc Holding	2017	0.0441	9.1419	0.1336	0.0800
Stanbic Ibtc Holding	2018	0.0530	9.2211	0.1417	0.0700
Stanbic Ibtc Holding	2019	0.0485	9.2733	0.1611	0.1100
Stanbic Ibtc Holding	2020	0.0381	9.3956	0.1523	0.1100
Stanbic Ibtc Holding	2021	0.0241	9.4382	0.1374	0.0900

Stanbic Ibtc Holding	2022	0.0331	9.4813	0.1346	0.0700
Stanbic Ibtc Holding	2023	0.0336	9.7114	0.0985	0.0310
Stanbic Ibtc Holding	2024	0.0357	9.8385	0.1372	0.0200
Sterling Bank	2013	0.0132	8.8499	0.0897	0.0800
Sterling Bank	2014	0.0130	8.9162	0.1027	0.0800
Sterling Bank	2015	0.0138	8.9028	0.1195	0.0800
Sterling Bank	2016	0.0072	8.9213	0.1027	0.0900
Sterling Bank	2017	0.0076	9.0303	0.0948	0.0800
Sterling Bank	2018	0.0086	9.0425	0.0887	0.0700
Sterling Bank	2019	0.0090	9.0729	0.1011	0.1100
Sterling Bank	2020	0.0095	9.1143	0.1043	0.1100
Sterling Bank	2021	0.0089	9.2120	0.0869	0.0900
Sterling Bank	2022	0.0112	9.2690	0.0829	0.0700
Sterling Bank	2023	0.0090	9.4033	0.0725	0.0430
Sterling Bank	2024	0.0286	9.5961	0.1299	0.0400
Union Bank Of Nig	2013	0.0038	9.0009	0.1864	0.0900
Union Bank Of Nig	2014	0.0268	9.0047	0.2191	0.0900
Union Bank Of Nig	2015	0.0141	9.0198	0.2330	0.0900
Union Bank Of Nig	2016	0.0126	9.0978	0.2169	0.1100
Union Bank Of Nig	2017	0.0105	9.1630	0.2360	0.1000
Union Bank Of Nig	2018	0.0129	9.1655	0.1541	0.0900
Union Bank Of Nig	2019	0.0133	9.2724	0.1348	0.1500
Union Bank Of Nig	2020	0.0119	9.3406	0.1206	0.1500
Union Bank Of Nig	2021	0.0080	9.4143	0.1028	0.1100
Union Bank Of Nig	2022	0.0112	9.4465	0.1062	0.0700
Union Bank Of Nig	2023	0.0174	9.6269	0.0874	0.0400
Union Bank Of Nig	2024	0.0174	9.6269	0.0874	0.0400
United Bank For Africa	2013	0.0212	9.4220	0.0890	0.0800
United Bank For Africa	2014	0.0203	9.4413	0.0963	0.0800
United Bank For Africa	2015	0.0249	9.4397	0.1184	0.0800
United Bank For Africa	2016	0.0259	9.5446	0.1279	0.0900
United Bank For Africa	2017	0.0256	9.6095	0.1297	0.0900
United Bank For Africa	2018	0.0219	9.6875	0.1032	0.0900
United Bank For Africa	2019	0.0199	9.7485	0.1067	0.1200
United Bank For Africa	2020	0.0171	9.8864	0.0941	0.1200
United Bank For Africa	2021	0.0179	9.9315	0.0942	0.0900
United Bank For Africa	2022	0.0185	10.0357	0.0849	0.0600
United Bank For Africa	2023	0.0367	10.3150	0.0983	0.0380

United Bank For Africa	2024	0.0357	10.4132	0.0949	0.0400
Unity Bank	2013	-0.0833	8.6060	0.0699	0.1100
Unity Bank	2014	0.0330	8.6163	0.1845	0.1100
Unity Bank	2015	0.0053	8.6467	0.1863	0.1100
Unity Bank	2016	0.0037	8.6926	0.1687	0.1300
Unity Bank	2017	-0.0910	8.1945	-1.5475	0.1200
Unity Bank	2018	0.0060	8.3729	-1.0327	0.1100
Unity Bank	2019	0.0124	8.4669	-0.9516	0.1700
Unity Bank	2020	0.0045	8.6920	-0.5598	0.1700
Unity Bank	2021	0.0062	8.7315	-0.5125	0.1200
Unity Bank	2022	0.0022	8.7077	-0.5390	0.0800
Unity Bank	2023	-0.0714	8.6745	-0.6917	0.0690
Unity Bank	2024	-0.0714	8.6745	-0.6917	0.0690
Wema Bank	2013	0.0059	8.5197	0.1251	0.0386
Wema Bank	2014	0.0081	8.5827	0.1144	0.0350
Wema Bank	2015	0.0077	8.5985	0.1161	0.0300
Wema Bank	2016	0.0077	8.6274	0.1201	0.0300
Wema Bank	2017	0.0078	8.5890	0.1278	0.0280
Wema Bank	2018	0.0098	8.6891	0.1041	0.0250
Wema Bank	2019	0.0094	8.8548	0.0771	0.0240
Wema Bank	2020	0.0060	8.9942	0.0599	0.0230
Wema Bank	2021	0.0105	9.0702	0.0597	0.0230
Wema Bank	2022	0.0103	9.1589	0.0572	0.0600
Wema Bank	2023	0.0194	9.3518	0.0620	0.0431
Wema Bank	2024	0.0230	9.4692	0.1174	0.0452
Zenith Bank	2013	0.0338	9.4974	0.1620	0.0600
Zenith Bank	2014	0.0319	9.5746	0.1472	0.0600
Zenith Bank	2015	0.0314	9.6028	0.1483	0.0600
Zenith Bank	2016	0.0319	9.6758	0.1475	0.0700
Zenith Bank	2017	0.0356	9.7478	0.1451	0.0700
Zenith Bank	2018	0.0389	9.7749	0.1370	0.0800
Zenith Bank	2019	0.0383	9.8026	0.1484	0.1100
Zenith Bank	2020	0.0302	9.9285	0.1318	0.1100
Zenith Bank	2021	0.0297	9.9753	0.1354	0.0800
Zenith Bank	2022	0.0232	10.0894	0.1122	0.0500
Zenith Bank	2023	0.0391	10.3090	0.1141	0.0450
Zenith Bank	2024	0.0513	10.3535	0.1138	0.0200