Macroeconomic Volatility and the Efficacy of Risk Management Practices in Nigerian Deposit Money Banks

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ABSTRACT

The complex interplay between internal risk management and external macroeconomic volatility shapes the financial performance of Nigerian Deposit Money Banks (DMBs). This study investigated the determinants of bank financial performance using balanced panel data from 2004 to 2023. Employing a panel regression model, the analysis assesses the impact of bank-specific risks, including Non-Performing Loan Ratio (NPLR) and Cost-to-Income Ratio (CIR), alongside macroeconomic factors, including Exchange Rate Volatility (ERV) and Interest Rate Volatility (IRV), on the bank's financial performance. The findings reveal that internal risk factors are the primary drivers of DMBs' performance. Both a high CIR ($\beta=-0.630$, $p<0.01$) and a high NPLR ($\beta=-0.358$, $p<0.01$) were found to have a strong, statistically significant negative impact on ROE. Macroeconomic volatility presents a dual effect: ERV is significantly detrimental to profitability ($\beta=-16.03$, $p<0.05$), while IRV is associated with higher ROE ($\beta=52.514$, $p<0.01$), suggesting opportunities for adept asset-liability management. The findings revealed that the negative impact of NPLR is significantly amplified during periods of high inflation volatility; while larger banks consistently achieve higher profitability, confirming the importance of economies of scale. The study concludes that while robust internal controls are paramount for bank performance, macroeconomic stability is essential for sector-wide resilience. Key recommendations include enhancing operational efficiency and credit risk frameworks within banks and fostering a stable policy environment to mitigate external shocks.

Keywords: Macroeconomic volatility, Risk management, Nigerian Deposit Money Banks, Non-performing loans, Economic stability

1.0 INTRODUCTION

Macroeconomic volatility has become a defining characteristic of Nigeria's economic landscape, with fluctuations in inflation, exchange rates, and GDP growth posing significant challenges to businesses and financial institutions alike. Over the past decade, the country's inflation rate has oscillated considerably, reaching as high as 18.17% in 2021 before moderating slightly to around 15.63% in 2022 (Central Bank of Nigeria [CBN], 2024). Concurrently, the naira has experienced recurrent depreciation pressures, often amplified by declining oil revenues which is an ongoing concern because oil sales contribute approximately

90% of Nigeria's export earnings (World Bank, 2025). Macroeconomic instability directly affect the ability of Deposit Money Banks (DMBs) to anticipate and withstand financial shocks, thereby elevating the importance of robust risk management practices.

Existing research has consistently underscored the centrality of risk management to bank performance, often focusing on factors such as credit, liquidity, and operational risks (Fadun et al., 2025; Fadun & Silwimba, 2023; Ololade et al., 2023; Jacob et al., 2022; Adeusi et al., 2013). However, the literature suggests that these internal variables may fail to capture the full complexity of the threats facing banks in a dynamic environment (Fadun & Silwimba, 2023; Abubakar et al., 2020). While Nigerian banks have adopted measures like capital adequacy requirements and stringent asset quality reviews, the efficacy of these strategies can be contingent upon macro-level conditions (Fadun & Silwimba, 2023; Fadun & Oye, 2021, 2020; Muhammad & Yusuf, 2017). For instance, a rapid depreciation in the naira can strain banks' foreign-denominated liabilities and expose balance sheets to heightened market risk. Similarly, prolonged inflationary spells can erode the real value of loan repayments and push non-performing loan ratios upward (Fadun et al., 2025; Funso & Lawal, 2020).

Despite the intuitive links between macroeconomic turbulence and internal risk management outcomes, the existing literature offers limited insight into how these larger economic forces interact with bank-specific risk frameworks to influence financial performance. Many studies rely on retrospective, firm-level data without systematically incorporating variables such as interest rate volatility, inflation, or GDP growth into their models (Jacob et al., 2022; Gambo et al., 2019).

This narrowed perspective may yield an incomplete understanding of how Nigerian DMBs adapt to external shocks and maintain stability, which is an omission that grows increasingly consequential given ongoing regulatory reforms, technological disruptions, and intensified global economic interdependencies.

Integrating macroeconomic volatility into the Nigerian Deposit Money Banks' risk management strategies enables a robust assessment of their resilience. This is essential to capture the real-world conditions under which banks operate, including unpredictable shifts in monetary policy and international capital flows. It also offers practical value for policymakers and bank managers seeking evidence-based insights to refine regulatory guidelines and implement more dynamic risk management protocols. This study explores the extent to which macroeconomic volatility influences the effectiveness of risk management practices and, ultimately, financial performance among Deposit Money Banks in Nigeria.

2.0 EMPIRICAL AND THEORETICAL REVIEW

Empirical Review

Jacob et al. (2022) examined the impact of liquidity risk management on the financial performance of listed deposit money banks in Nigeria. They employed panel data analysis using STATA 13 on data spanning from 2006 to 2019. Their findings indicate that higher ratios of short-term liabilities to liquid assets significantly reduce Return on Assets (ROA), leading to the conclusion that effective liquidity management is essential for improving bank performance. However, the study is limited by its focus solely on listed banks, which may not capture the broader dynamics of the entire banking sector.

Adeusi et al. (2013) investigated the relationship between risk management practices and bank performance in Nigeria. Utilising a panel data estimation technique with data collected from 10 banks over four years, they discovered that well-managed funds correlate positively with bank performance, while an increase in doubtful loans exerts an inverse effect. The study concludes that robust risk management practices enhance financial outcomes, though its limitation lies in not incorporating external macroeconomic variables like inflation and economic growth.

Ololade et al. (2023) explored how risk management practices influence the performance of deposit money banks with international authorisation. Through panel data analysis, they determined that credit risk significantly boosts bank performance, whereas liquidity and capital risks show negligible effects, with management quality emerging as a critical factor. The study concludes that tailored risk management strategies are vital in volatile economic environments; however, its generalisability is limited as it focuses exclusively on internationally authorised banks.

Okere, et al. (2018) analysed the connection between risk management practices (e.g., credit and liquidity risk management) and the financial performance of deposit money banks in Nigeria. Using panel data regression analysis, the study reported a positive relationship between robust risk management and enhanced financial performance, underscoring the importance of effective risk practices for sustainable operations. A limitation noted is the retrospective design, which may not accurately forecast the influence of future macroeconomic fluctuations.

Muhammad and Yusuf (2017) evaluated the impact of credit and liquidity risks on the profitability of listed deposit money banks in Nigeria using Ordinary Least Squares (OLS) regression. Their results confirmed that both credit risk and liquidity risk have a significant effect on bank profitability, reinforcing the need for stringent risk management practices. While the study emphasises the critical nature of these risks, it is limited by the exclusion of operational and market risks that might also interact with macroeconomic volatility.

Abdullah and Tela (2022) assessed the impact of risk management on bank profitability using an OLS random effect regression model. Their analysis revealed that both corporate risk management and interest rate risk management negatively affect profitability, leading to recommendations for enhanced risk frameworks. The study concludes that inefficiencies in these practices can undermine financial performance in volatile economic settings. However, it focuses on listed banks, which restricts the applicability of the findings to the broader sector. Ahmed and Haruna (2024) investigated how various financial risk management practices influence the performance of deposit money banks in Nigeria. Using panel least squares regression and moderated multiple regression (MMR), they found that operational risk management and corporate risk management significantly enhance return on average assets. However, firm size did not moderate this relationship as expected. The study concludes that while internal risk practices are critical for financial success, additional qualitative factors may also play a role—a nuance not fully captured by the quantitative approach.

Okolie et al. (2023) analysed the effect of risk management on the financial performance of money deposit banks using panel data regression analysis with E-views 12.0. Their findings indicate that interest rate risk, in particular, exerts a significant positive influence on both return on equity (ROE) and return on assets (ROA), suggesting that fluctuations in interest rates are pivotal in determining bank performance. The study concludes that robust interest rate risk management is crucial. However, its limitation is the small sample size of only five commercial banks, which may not represent the entire sector.

Onyefulu et al. (2019) investigated the interplay between different financial risks and bank performance across 20 deposit money banks in Ghana and Nigeria. Using multiple regression and correlation analysis on data from 2009 to 2018, they found that liquidity risk significantly reduces ROA, while operational risk unexpectedly enhances performance, and interest rate risk shows an insignificant effect on ROE. The study concludes that the impact of risk management varies across different risk types, but its focus on Ghana and Nigeria may limit broader applicability.

Natufe and Evbayiro-Osagie (2023) assessed the influence of credit risk management practices on the financial performance of deposit money banks through panel data regression analysis covering 2010 to 2021. They identified that factors such as the capital adequacy ratio,

risk asset ratio, non-performing loans ratio, and bank size significantly affect return on equity (ROE). The study concludes that internal risk management, in tandem with key bank characteristics, plays a vital role in determining performance; however, reliance on banks using Eurobonds for risk assets may limit the generalizability of the findings in the context of macroeconomic volatility.

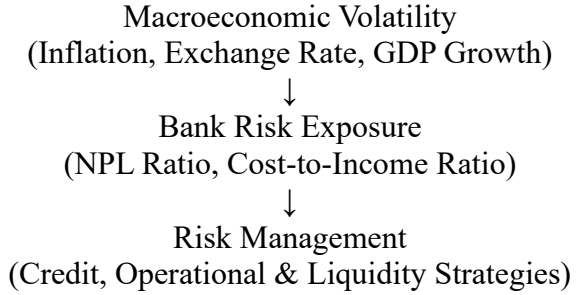
The literature reveals that while diverse aspects of risk management (e.g., liquidity, credit, interest rate, operational, and corporate governance) influence the financial performance of Nigerian deposit money banks significantly, there is considerable variability in the magnitude and direction of these effects. Several studies demonstrate that effective management of liquidity and credit risks tends to enhance profitability. In contrast, others highlight that specific risk management strategies, including corporate and interest rate risk practices, may have adverse impacts under certain conditions. Generally, the studies' methodologies predominantly rely on panel data regressions and OLS techniques, with a few studies incorporating moderated analyses to assess the role of bank-specific characteristics. Notably, many studies are limited by small sample sizes, a focus on listed or internationally authorised banks, and retrospective designs.

Crucially, a significant research gap emerges from the limited incorporation of external macroeconomic variables such as inflation, GDP growth, and broader interest rate fluctuations thus underscoring the need for comprehensive investigations that integrate both internal risk management practices and macroeconomic volatility to better explain performance variations across the entire Nigerian banking sector. This study was conducted to address this shortcoming attempting to bridge the gap in knowledge.

The study drew on three major theories towards examining the extent to which macroeconomic volatility influences the effectiveness of risk management practices and, ultimately, financial performance among Deposit Money Banks in Nigeria. The theories include Financial Accelerator Theory, Risk Management Theory and the Too-Big-to-Fail Hypothesis.

From the purview of the Financial Accelerator Theory, large swings in inflation, exchange rates, or GDP intensify banks' credit and operational risks by eroding borrowers' repayment capacity and raising currency-related costs, whereas stable growth and moderate inflation preserve credit quality (Bernanke et al., 1999). Risk Management Theory holds that robust internal controls, rigorous credit evaluation, and ample capital buffers (via cost-to-income monitoring and loan provisioning) help banks withstand external shocks (Stulz, 1996). The Too-Big-to-Fail Hypothesis adds that larger, better-capitalised banks weather macroeconomic turmoil more effectively than smaller peers, making bank size a key moderator in the volatility–performance link (Berger & Bouwman, 2013).

Figure 1 shows this study's conceptual framework.



↓
Financial Performance
(ROE, ROA, etc.)
↑
Bank Size
(Moderates above relationships)

Figure 1: Conceptual Framework
Source: Authors' Conceptualisation (2025)

3.0 METHODOLOGY

This study used a panel of Nigerian Deposit Money Banks (DMBs) from 2004 to 2023 to examine how macroeconomic volatility, risk management, and bank size jointly affect financial performance. Secondary data on inflation, interest rate, exchange rate, and GDP growth volatility (from CBN, NBS, World Bank, and IMF) and bank metrics ROE, NPLR, LDR, and CIR (from audited reports and CBN disclosures) were gathered for all banks with complete twenty-year records.

Financial Performance Equation (ROE)

This was measured by the Panel Regression model as shown below:

$$PERF_{it} = \beta_0 + \beta_1 NPLR_{it} + \beta_2 LDR_{it} + \beta_3 CIR_{it} + \beta_4 IV_t + \beta_5 ERV_t + \beta_6 IRV_t + \beta_7 GDVG_t + \beta_7 GDVG_t + \beta_8 (IV_t \, x \, NPLR_{it}) + \beta_9 (ERV_t \, x \, CIR_{it}) + \beta_{10} \, ln(SIZE_{it}) + \beta_{11} \, (ln(SIZE_{it} x \, IV_t) \, x \, ERV_t + \theta_i + \lambda_t + \epsilon_{it}$$

Risk Metrics Equations (Simultaneous System)

$$NPLR_{it} = \gamma_0 + \gamma_1 IV_t + \gamma_2 ERV_t + \gamma_3 IRV_t + \gamma_4 GDVG_t + v_{it}$$
$$LDR_{it} = \delta_0 + \delta_1 IV_t + \delta_2 ERV_t + \delta_3 IRV_t + \delta_4 GDVG_t + \eta_{it}$$
$$CIR_{it} = \phi_0 + \phi_1 IV_t + \phi_2 ERV_t + \phi_3 IRV_t + \phi_4 GDVG_t + \kappa_{it}$$

Where:

$PERF_{it}$	=	Financial performance of the bank measured by ROE
$NPLR_{it}$	=	Non-performing loan ratio for bank iii at time t.
LDR_{it}	=	Loan-to-deposit ratio for bank iii at time t
CIR_{it}	=	Cost-to-Income Ratio for bank i at time t
IV_t	=	Inflation Volatility at time t.
ERV_t	=	Exchange Rate Volatility at time t.
IRV_t	=	Interest Rate Volatility at time t.
$GDVG_t$	=	GDP Growth Volatility at time t.
v_{it}	=	The error term for the NPLR equation
$SIZE_{it}$	=	The size of the bank measured by total assets
θ_i	=	Bank-specific fixed effects.
λ	=	Time-fixed effects.
ϵ	=	The error term capturing the unobserved factors that influence the
$\beta_0,\beta_1,\ldots,\beta_{11}$	=	Coefficients in the financial performance equation
$\gamma_0,\gamma_1,\ldots,\gamma_4$	=	Coefficients in the NPLR equation
$\delta_0,\delta_1,\ldots,\delta_4$	=	Coefficients in the LDR equation
$\phi_0,\phi_1,\ldots,\phi_4$	=	Coefficients in the CIR equation

4.0 RESULTS

Descriptive Statistics and Preliminary Analysis

An initial analysis of the panel data from 2004 to 2023 provides essential context for the Nigerian banking sector. As shown in Table 1, the average Return on Equity (ROE) for the sampled banks was 18.78%, indicating a generally profitable operating environment, though with significant performance variation (Std. Dev. = 7.36). The mean Non-Performing Loan Ratio (NPLR) stood at 5.45%, hovering slightly above the regulatory comfort threshold of 5%. Key macroeconomic indicators exhibited considerable instability, particularly the measures for Exchange Rate Volatility (ERV) and Inflation Volatility (IV), underscoring the turbulent external environment in which these banks operate.

Table 1: Descriptive Statistics

Statistics	ROE	NPLR	LDR	CIR	IV	ERV	IRV	GDGV	SIZE
Mean	18.78	5.45	63.95	53.29	0.12	0.46	0.12	0.68	8.56
Std	7.36	5.06	12.39	9.5	0.06	0.41	0.04	0.51	0.79
Min	-5.3	1.1	38.1	31.8	0.01	0.01	0.04	0.05	6.79
25%	15.1	2.9	55.95	47.95	0.08	0.05	0.09	0.25	7.98
50%	18.45	4.2	62.35	53.95	0.12	0.37	0.12	0.64	8.68
75%	22.95	5.85	70.55	58.97	0.16	0.83	0.15	1.01	9.2
Max	40.7	34.7	104.9	88.4	0.28	1.41	0.23	2.09	10.28

The correlation matrix in Table 2 reveals preliminary relationships that align with financial theory. Notably, ROE demonstrates a strong negative correlation with the Cost-to-Income Ratio (CIR) (r = -0.58) and a moderate negative correlation with the NPLR (r = -0.34). This suggests, as expected, that lower operational efficiency and poorer asset quality are associated with diminished profitability.

Table 2: Correlation Matrix

	ROE	NPLR	LDR	CIR	IV	ERV	IRV	GDGV	SIZE
ROE	1								
NPLR	-0.34	1							
LDR	0.03	0.01	1						
CIR	-0.58	0.23	0.11	1					
IV	0.02	0.16	0.04	0.13	1				
ERV	-0.1	0.18	0.16	0.2	0.53	1			
IRV	0.21	-0.17	0.04	-0.26	-0.42	-0.19	1		
GDGV	-0.2	0.2	-0.08	0.28	0.11	0.01	-0.41	1	
SIZE	0.14	-0.01	0.19	-0.13	0.47	0.72	-0.2	-0.11	1

Effects of Macroeconomic Volatility and Risk Management Practices on the Financial Performance of the DMB

The panel regression model results (Table 3) show a quantitative summary of the factors associated with the financial performance of Nigerian Deposit Money Banks (DMBs). The model's high explanatory power (Adjusted $R^2 = 0.802$) and the overall significance (F-statistic p-value = 0.000) indicate that it reliably captures the key relationships in the data. The findings demonstrate that strong internal risk management practices are associated with superior financial performance. The highly significant negative coefficient for the Cost-to-Income Ratio (CIR) ($\beta = -0.630$) indicates that a one percentage point increase in this ratio predicts a 0.63 percentage point decrease in Return on Equity (ROE), on average. This significant relationship suggests that operational inefficiency represents a primary drag on profitability.

Similarly, the Non-Performing Loan Ratio (NPLR) is significantly and negatively associated with ROE ($\beta = -0.358$). This suggests that a one percentage point rise in bad loans is associated with a 0.36 percentage point fall in ROE. While we cannot definitively state that bad loans *cause* lower profits (as lower profits could also constrain risk management), the model confirms that credit quality and profitability are significantly and inversely related.

The model also reveals a complex pattern of associations between macroeconomic volatility and bank performance. A significant positive relationship exists between Interest Rate Volatility (IRV) and ROE ($\beta = 52.514$). This suggests that periods of interest rate fluctuation are linked to periods of higher bank profitability. This association is consistent with a scenario where banks with strong deposit franchises can capitalise on widening margins, but we cannot rule out other unobserved factors. Conversely, Exchange Rate Volatility (ERV) is significantly and negatively associated with ROE ($\beta = -16.03$). This indicates that currency instability is linked to weaker bottom-line performance, a relationship consistent with the theory that such volatility increases credit risk and hedging costs.

The model's interaction terms also provide unique insights, revealing how these associations are themselves conditional. The significant negative coefficient for the IV x NPLR interaction demonstrates that the negative relationship between NPLR and ROE becomes significantly stronger during periods of high inflation volatility. This does not prove that volatility *causes* the relationship to worsen. However, it shows a clear pattern where the two conditions (high NPLR and high inflation volatility) are linked to poor performance. This finding strongly suggests that the consequences associated with poor internal risk controls are amplified in an unstable macroeconomic environment.

Finally, the analysis confirms that structural characteristics are strongly linked to performance. The positive and significant coefficient on bank size (SIZE) ($\beta = 10.635$) shows that larger banks are consistently associated with higher profitability. This relationship is consistent with theories of economies of scale and market power.

Table 3: Panel Regression Model Analysis of Effect of Macroeconomic Volatility and Risk Management Practices on Financial Performance of the DMB.

Variable	Coefficient	Robust Std. Err.	t-statistic	p-value
(Constant)	-44.591	13.911	-3.205	0.002***
NPLR	-0.358	0.126	-2.839	0.005***
LDR	-0.015	0.046	-0.316	0.752
CIR	-0.63	0.071	-8.825	0.000***
IV	-1.189	14.281	-0.083	0.934

ERV	-16.03	7.886	-2.033	0.044**
IRV	52.514	14.12	3.719	0.000***
GDGV	-0.067	0.811	-0.083	0.934
IV x NPLR	-18.733	9.096	-2.059	0.042**
ERV x CIR	0.134	0.101	1.334	0.185
SIZE	10.635	3.125	3.403	0.001***
SIZE x IV x ERV	0.38	0.222	1.713	0.089*
Adjusted R-squared	0.802			
F-statistic	35.88			
p-value	0.000			

Notes: *** p<0.01, ** p<0.05, * p<0.1

To test the validity of the results presented above, multicollinearity and Heteroskedasticity tests were conducted, and the results are presented in Tables 4 and 5. Multicollinearity occurs when independent variables in a regression model are highly correlated. This can make the model's coefficient estimates unstable and challenging to trust. To test multicollinearity, the Variance Inflation Factor (VIF) was adopted. VIF measures how much the variance of an estimated regression coefficient is increased because of this correlation. Table 4 shows that multicollinearity is not a significant concern for this analysis. A common rule of thumb is that a VIF value exceeding 10 indicates a problematic level of correlation. In this model, all variables are well below this critical threshold. The variables with the highest VIFs are SIZE (7.82) and ERV (7.28), which is expected given their inclusion in interaction terms. However, since their VIFs remain below 10, we can confidently interpret the model's coefficients without worrying that intercorrelations among the predictors distort the results. This diagnostic confirms the stability and reliability of the individual variable effects (Tables 2 and 3).

Table 4: Variance Inflation Factor (VIF) Test Results

Variable	Variance Inflation Factor (VIF)
NPLR_perc	1.25
LDR_perc	1.1
CIR_perc	1.94
IV	4.6
ERV	7.28
IRV	1.62
GDGV	1.34
IV_x_NPLR	1.14
ERV_x_CIR	1.57
SIZE	7.82
SIZE_x_IV_x_ERV	3.25

For the heteroskedasticity test, the Breusch-Pagan Test was adopted. Heteroskedasticity refers to the situation where the variance of the errors in a regression model is not constant across all observations. In financial analysis, this is common. For example, larger banks might have larger and more unpredictable profit swings than smaller banks. The presence of

heteroskedasticity violates a key assumption of Ordinary Least Squares (OLS) regression, leading to unreliable p-values and potentially incorrect conclusions about which variables are statistically significant. The results of the Breusch-Pagan test, shown in Table 5, provide evidence of Homoskedasticity in this model. The test's p-value is 0.0004, which is the conventional significance level of 0.05, informing the decision to reject the null hypothesis of homoskedasticity (constant variance) in the data.

Table 5: Breusch-Pagan Test for Heteroskedasticity

Test Component	Value
Lagrange Multiplier (LM) Statistic	35.8
p-value of LM Statistic	0.0004
Null Hypothesis (H_0)	Homoskedasticity (Constant Variance) is Present
Conclusion	Reject H_0 at the 1% significance level

5.0DISCUSSIONS AND RECOMMENDATIONS

This study's analysis of the Nigerian banking sector from 2004 to 2023 offers important information on the interplay between internal risk management, macroeconomic volatility, and financial performance. The results not only confirm several established theories within banking literature but also provide specific, contextual insights relevant to the Nigerian economic landscape. The high explanatory power of the model (Adjusted $R^2 = 0.802$) suggests that the selected variables capture the core drivers of profitability for Nigerian Deposit Money Banks (DMBs).

A primary finding of this study is that internal, bank-specific factors are paramount in determining profitability. The significant negative coefficients for both the Cost-to-Income Ratio (CIR) and the Non-Performing Loan Ratio (NPLR) strongly underscore this point. Our result, which shows that poor asset quality erodes profitability, aligns with a broad consensus in the Nigerian banking literature. For instance, Adeusi et al. (2013) found that an increase in doubtful loans has an inverse effect on bank performance. Similarly, Muhammad and Yusuf (2017) confirmed that credit risk has a significant negative impact on profitability, and Natufe and Evbayiro-Osagie (2023) identified the NPLR as a significant determinant of Return on Equity (ROE). This body of work, consistent with our findings, reinforces that credit risk management is not merely a regulatory compliance issue but a fundamental determinant of financial success.

Furthermore, the finding indicates that a high CIR (a proxy for operational inefficiency) is detrimental to ROE, which is supported by Ahmed and Haruna (2024) who highlighted that effective operational risk management significantly enhances returns. The results suggest that the banks that succeed are those that master internal controls, managing both the quality of their loan book and the efficiency of their operations. This validates the broader conclusions of Okere et al. (2018), who reported a strong positive link between robust risk management and financial performance.

This study reveals that volatility is not a monolithic force and that its impact depends on its source. The finding that Exchange Rate Volatility (ERV) is significantly and negatively associated with ROE points to the unique vulnerabilities of the Nigerian economy. Conversely, and perhaps counterintuitively, our model shows that Interest Rate Volatility (IRV) has a significant positive relationship with ROE. This suggests that Nigerian banks are adept at turning interest rate fluctuations into profitable opportunities, likely by repricing assets faster than liabilities to widen their net interest margins. This specific finding is strongly corroborated

by Okolie et al. (2023), who also found that interest rate risk exerts a significant positive influence on both ROE and ROA.

The finding is at variance with Abdullah and Tela (2022), who revealed that interest rate risk management negatively affects profitability, and with Onyefulu et al. (2019), who found the effect to be insignificant. This divergence suggests that the ability to profit from interest rate volatility is not universal and likely depends on the specific strategies and capabilities of a bank's treasury and asset-liability management teams.

This study makes a key contribution by examining how internal and external factors interact. The significant negative coefficient for the IV x NPLR interaction term demonstrates that the adverse effects of high NPLs are significantly amplified during periods of high inflation volatility. While studies like Adeusi et al. (2013) established the direct negative impact of bad loans, our analysis extends this by showing that a volatile macroeconomic environment acts as a "threat multiplier." This finding empirically validates the need for what Ololade et al. (2023) termed "tailored risk management strategies" for volatile economic environments.

Finally, our analysis confirms that structural characteristics matter. The strong, positive, and significant coefficient for bank size indicates that larger banks consistently achieve higher profitability. This result is in direct alignment with Natufe and Evbayiro-Osagie (2023), who also identified bank size as a significant factor affecting ROE. This suggests the enduring presence of economies of scale and market power in the Nigerian banking sector, giving larger institutions a durable competitive advantage.

Based on the foregoing, the following are recommended:

1. Improve Operational Efficiency: Banks need to prioritise lowering their Cost-to-Income Ratio (CIR) to boost profitability performance. This may be done through technology adoption and process optimisation
2. Strengthen Credit Risk Management. This can be done by enhancing their loan underwriting and recovery processes to reduce Non-Performing Loans (NPLs). This is especially critical during periods of high inflation, which significantly worsens the negative impact of bad loans.
3. Enhance Macroeconomic Stability: Policymakers should focus on implementing measures to control inflation and stabilise the exchange rate. The findings clearly show that volatility in these areas directly harms bank performance and amplifies financial sector risk.
4. Consider Strategic Consolidation: Given that larger bank size is strongly linked to higher profitability performance, smaller banks should explore strategic options like mergers and acquisitions to achieve the necessary economies of scale to compete effectively.

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