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IMPACT OF DISAGGREGATED INTEREST RATES ON BANKING SECTOR PERFORMANCE IN NIGERIA (1995–2023)

AKUONU, Onyinyechukwu Obiageli[1], SALIHU Liman Mairafi[2] & MOHAMMED Ibrahim[3]

[1,2,3]Department of Banking and Finance, Nasarawa State University

[1]onyikuons@ymail.com & [2]salihulimanmairafi@nsuk.edu.ng

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ABSTRACT

This study examines the effect of real interest rate on the real profitability of listed banks in Nigeria using quarterly time-series data from 1995Q3 to 2023Q4. An ex-post facto research design was adopted, while the Autoregressive Distributed Lag (ARDL) framework was employed to capture both short-run dynamics and long-run equilibrium relationships among real lending rate (RLR), real monetary policy rate (RMPR), real interbank rate (RIBR), and real return on assets (RROA). The unit root results confirm that all variables are integrated of order one, thereby justifying the ARDL bounds testing approach, which further establishes the existence of a stable long-run relationship among the variables. The findings reveal that increases in interest rate components exert significant negative effects on bank profitability in the short run, reflecting higher funding costs, tighter liquidity conditions, and constrained credit expansion. However, the lagged coefficients of the interest rate variables are positive and significant in the long run, indicating that banks adjust through asset-liability repricing, portfolio restructuring, and margin recovery over time. The error correction term is negative and statistically significant, confirming a stable equilibrium with a relatively fast speed of adjustment toward long-run balance. The study concludes that while monetary tightening initially suppresses bank performance, adaptive financial intermediation mechanisms enable profitability recovery over time. It recommends a predictable and transparent monetary policy framework alongside strengthened asset-liability management practices to enhance banking sector resilience under fluctuating macroeconomic conditions.

Keywords: Interbank Rate, Interest Rate, Lending Rate, Monetary Policy Rate, Return on Asset, Banks Performance.

Introduction

The banking sector plays a pivotal and strategic role in the functioning and stability of national economies, particularly in developing countries such as Nigeria. Banks serve as the main intermediaries for mobilizing deposits, allocating credit, supporting payment infrastructure, and facilitating monetary policy transmission. According to Ogbuji and Lawal (2024), banks remain central to financial deepening, investment promotion, and the maintenance of overall systemic stability in Nigeria. Through intermediation, banks not only stimulate productive activity but also enhance financial inclusion, expand access to finance, and support both public and private sector growth. The sector's importance is further reinforced by the increasing reliance on digital finance, which has enhanced banking resilience and broadened its contribution to economic development (Discover Analytics, 2024).

Performance evaluation in the banking sector is essential for understanding the efficiency, profitability, and long-term sustainability of financial institutions. Bank performance is typically measured using indicators such as Return on Assets (ROA), Return on Equity (ROE), liquidity ratios, capital adequacy, and asset quality (Adeleke & Alabi, 2023). However, in economies characterized by persistent inflation such as Nigeria, nominal financial indicators often fail to capture the real economic value of banking returns. Inflation distorts the purchasing power of earnings, leading to misleading interpretations of financial outcomes when nominal profitability measures are used. As Ajayi (2022) argues, inflation adjusted performance metrics offer a more accurate representation of the true profitability and operational resilience of banks, particularly in environments experiencing sustained price instability. Therefore, this study adopts inflation adjusted ROA as a more reliable measure of real performance for listed Nigerian banks.

Recent developments in Nigeria's banking sector underscore the necessity of evaluating performance in real rather than nominal terms. Although several banks have declared record nominal profits, these gains have been significantly influenced by macroeconomic distortions such as naira depreciation and foreign exchange revaluation adjustments. For example, GTCO's 2023 profit surge was largely attributed to exchange rate gains rather than improvements in core banking operations (GTCO, 2023). Similarly, Access Holdings posted strong earnings but also reported substantial increases in loan impairment charges, indicating weakening asset quality (Access Holdings, 2023). Zenith Bank experienced a rise in its non-performing loan ratio above the regulatory benchmark despite high nominal earnings (Zenith Bank, 2023). These developments align with sector-wide findings that rising inflation, increasing credit defaults, and volatile macroeconomic conditions have eroded the real profitability of Nigerian banks (Agusto & Co., 2024). Thus, capturing true economic performance requires adjusting profitability for inflation, making real ROA more appropriate for empirical analysis.

Interest rate remains one of the most influential macroeconomic variables shaping the performance of financial institutions. It represents the cost of borrowing and the reward for saving, and it directly influences credit allocation, investment behaviour, liquidity management, and banks' net interest margins. The monetary policy rate (MPR) set by the Central Bank of Nigeria (CBN) guides lending and deposit rates across the financial system. As Alalade et al. (2024) note, interest rate changes significantly affect bank profitability through variations in loan pricing, funding costs, and lending volume. High interest rates may increase interest income initially but tend to reduce loan demand, constrain credit creation, and raise default risks, all of which negatively impact bank performance (Gichuki & Wanjiru, 2023). Conversely, lower interest rates may stimulate lending but compress net interest margins and reduce profitability unless offset by efficiency gains or diversification of income (Komba & Makunja, 2022).

The Nigerian macroeconomic environment amplifies the sensitivity of bank performance to interest rate movements. Nigeria has experienced prolonged periods of economic volatility, marked by high inflation, fluctuating exchange rates, inconsistent GDP growth, and recurring oil price shocks. Onaolapo and Olufemi (2022) find that interest rate volatility adversely affects bank profitability and asset quality in Nigeria, contributing to earnings instability and heightened credit default risk. This is consistent with Uzonwanne (2023), who argues that macroeconomic instability in Nigeria, particularly inflation and exchange rate movements, weakens banks' capacity to maintain strong real performance even during periods of high nominal income. Moreover, monetary tightening through elevated interest rates and high cash reserve requirements has been shown to restrict banks' liquidity and lending capacity, further constraining real profitability (Momodu et al., 2024).

In this context, examining the effect of interest rate on inflation adjusted performance of listed Nigerian banks becomes not only relevant but necessary. Prior empirical studies have often focused on nominal profitability or examined macroeconomic variables in isolation. This creates a gap in understanding how interest rate fluctuations influence real, inflation adjusted performance over long periods. Lyimo and Hussein (2022) highlight the need for more comprehensive models that integrate multiple macroeconomic variables and use robust econometric techniques capable of capturing long-run relationships and interactive effects. This study responds to this gap by focusing specifically on how interest rate dynamics affect real ROA over a 30-year period, reflecting the long-term structural relationship between monetary policy and banking sector resilience.

Therefore, this research makes a significant contribution to banking and macroeconomic literature by examining the effect of interest rate on real performance of listed banks in Nigeria from 1995 to 2024. By using inflation adjusted ROA, the study provides a more accurate and credible understanding of how effectively Nigerian banks generate value amidst persistent macroeconomic volatility. The findings will be valuable to policymakers, regulators, investors, and bank managers seeking to develop strategies that enhance financial stability, improve risk management, and strengthen the sustainability of the banking sector in Nigeria's dynamic economic environment.

The main objective of this study is to evaluate the effect of interest rate on performance of listed banks in Nigeria.

Based on the above objective**:**

H_{01}: Real lending rate has no significant impact on performance of listed banks in Nigeria.

H_{02}: Real monetary policy rate has no significant impact on performance of listed banks in Nigeria.

H_{03}: Real interbank rate has no significant impact on performance of listed banks in Nigeria.

Literature Review

Concept of Performance

Performance in the banking sector refers to the ability of a financial institution to efficiently utilize its assets and resources to generate sustainable income. Traditionally, performance is measured using indicators such as Return on Assets (ROA) and Return on Equity (ROE), which reflect profitability relative to asset base and shareholders' funds. According to Akinyomi and Okpala (2013), performance metrics provide insight into managerial effectiveness, operational efficiency, and long-term financial stability.

However, in inflation-prone economies such as Nigeria, nominal financial indicators may distort the true economic value of earnings. Inflation reduces the purchasing power of

income and can therefore inflate profitability figures that do not represent real gains. Ajayi (2022) argues that adjusting performance measures for inflation yields a more accurate assessment of a bank's real value creation, especially in environments experiencing persistent price instability.

Inflation-adjusted ROA thus reflects the actual, rather than nominal, profitability of banks by isolating the impact of inflation on returns. As noted by Sarfraz, Raza and Mohd (2023), real performance metrics provide a clearer view of financial health by accounting for macroeconomic distortions, allowing stakeholders to evaluate resilience, operational strength, and sustainability more reliably. In this study, performance is measured as inflation-adjusted Return on Assets (Real ROA), computed by deflating nominal ROA using Nigeria's annual inflation rate to reflect true profitability in real economic terms.

Concept of Interest Rate

Interest rate refers to the price paid for the use of money and represents the cost of borrowing or the return on savings within a financial system. According to Mishkin (2019), interest rate functions as a key macroeconomic variable that coordinates the allocation of financial resources by influencing saving, investment, and consumption decisions. It acts as a central instrument through which monetary authorities regulate liquidity, stabilize prices, and guide overall economic activity.

In the banking sector, interest rates shape the profitability and performance of financial institutions by determining the spread between lending and deposit rates. As stated by Bernanke (2020), changes in interest rates affect loan demand, credit creation, funding costs, and the pricing of financial assets. High rates may reduce borrowing and increase default risk, while lower rates stimulate credit growth but compress net interest margins.

The relationship between interest rate and bank performance is therefore dynamic and sensitive to macroeconomic conditions. According to Alalade, Adekunle and Oloyede (2024), interest rate volatility influences earnings stability, asset quality, and operational efficiency, making it a key determinant of real banking performance.

Empirical Review

Ogundipe et al. (2020) investigated the effects of interest rate deregulation, including prime lending rate, maximum lending rate, and short-term deposit rates, on the performance of Nigerian deposit money banks over the period 1996-2018, using Return on Assets (ROA) as the performance indicator. Grounded in deregulation theory and interest rate transmission frameworks, the study employed time series stationarity testing, Bounds cointegration, and an Autoregressive Distributed Lag (ARDL) model using secondary data from the Central Bank of Nigeria (CBN) Statistical Bulletin and World Bank. Findings reveal that only the prime lending rate exhibited a positive and statistically significant relationship with ROA, whereas other interest rate components lacked significance; hence, interest rate deregulation broadly did not enhance bank real performance. The study recommended that banks deepen deposit mobilization by offering competitive rates to maximize loanable funds. However, it ends in 2018, excludes key macroeconomic controls (GDP, inflation, money supply, unemployment, oil price), and does not focus exclusively on listed banks.

Dike et al. (2025) analysed the influence of lending rate, monetary policy rate (MPR), and interbank rate on deposit money banks' Return on Equity (ROE) from 1981 to 2022 using Ordinary Least Squares (OLS) regression combined with stationarity tests, cointegration, and an error correction mechanism, drawing on CBN data. They found that lending rate had no significant effect on ROE, whereas MPR and interbank rate significantly influenced bank

performance. The study recommended adopting floating rate regimes and monitoring monetary policy tools to support macroeconomic stability and improve profitability. However, performance was measured by ROE rather than ROA, the pure lending rate impact was not isolated, and the macroeconomic context was narrow, omitting oil price, unemployment, and money supply variables. Additionally, the study focused on general deposit money banks rather than listed banks.

Obamuyi (2013) examined the relationship between interest rates and economic growth in Nigeria using time series data from 1970 to 2010, employing cointegration and error correction techniques. The study found that high and volatile interest rates negatively affect private investment and credit creation, which in turn constrains the profitability of financial intermediaries. The research highlighted that unstable lending rates discourage borrowing and increase default risk, thereby reducing bank earnings. However, the study focused on macroeconomic growth rather than directly measuring bank-level profitability. It also predated the recent era of monetary policy tightening in Nigeria (2015–2023) and did not adjust for inflation effects on real returns.

Alalade, Adekunle, and Oloyede (2024) investigated the effect of interest rate dynamics on the profitability of commercial banks in Nigeria using panel data from 2010 to 2022 and the system Generalized Method of Moments (GMM) estimator. The findings revealed that both lending rate and monetary policy rate exert a negative and statistically significant impact on bank profitability (measured by ROA and ROE), while deposit rate showed a positive but insignificant effect. The study concluded that monetary tightening compresses net interest margins and reduces banks' earnings capacity. However, the study used nominal profitability measures, which may overstate real returns in Nigeria's high-inflation environment. Furthermore, the sample period (2010–2022) does not capture the full post-COVID monetary tightening cycle of 2022–2023.

Onaolapo and Olufemi (2022) examined the impact of macroeconomic instability, including interest rate volatility, exchange rate fluctuations, and inflation, on the profitability of Nigerian deposit money banks from 2005 to 2020. Using panel data and fixed effects regression, the study found that interest rate volatility exerts a significant negative effect on both ROA and ROE, contributing to earnings instability and heightened credit default risk. The study recommended that banks adopt robust asset-liability management frameworks to mitigate the adverse effects of macroeconomic shocks. However, the study employed nominal profitability indicators and did not adjust for inflation, which may distort the true economic value of bank earnings during periods of high inflation. Additionally, the study concluded in 2020, before the recent tightening cycle (2022–2024) when the CBN raised MPR from 11.5% to 18.75%.

Uzonwanne (2023) investigated the combined effects of inflation and exchange rate volatility on the performance of Nigerian deposit money banks from 2010 to 2022, using Vector Error Correction Model (VECM) and Granger causality tests. The study found that both inflation and exchange rate volatility significantly erode bank profitability in the long run, even when nominal earnings appear strong. The research demonstrated that macroeconomic instability weakens banks' capacity to maintain strong real performance during periods of high nominal income due to foreign exchange revaluation losses and rising impairment charges. However, the study focused broadly on deposit money banks rather than listed banks specifically, and the interest rate channel was not fully disaggregated into lending rate, policy rate, and interbank rate components.

Gichuki and Wanjiru (2023) examined the relationship between interest rate volatility and bank profitability across 12 Sub-Saharan African countries, including Nigeria, using panel data from 2010 to 2022 and the Generalized Method of Moments (GMM) estimator. The findings revealed that interest rate volatility exerts a significant negative impact on bank profitability, as higher rates reduce loan demand, constrain credit creation, and raise default risks. The study also found that banks with diversified income streams and strong capital buffers are better able to withstand interest rate shocks. However, the study used nominal ROA and did not adjust for inflation, which is particularly problematic in high-inflation countries like Nigeria. Furthermore, the study aggregated all Sub-Saharan African countries, potentially masking country-specific institutional and regulatory differences.

Theoretical Framework

The Interest Rate Transmission Mechanism, a component of Monetary Policy Transmission Theory (Taylor, 1995), is the most appropriate and strongest theoretical foundation for a study on interest rate and bank performance. The theory posits that changes in the central bank's policy rate influence the cost of funds, lending and deposit rates, credit creation, asset valuation, and ultimately the profitability of financial institutions (Mishkin, 2019). Through this mechanism, shifts in interest rate affect banks' net interest margins, loan demand, default risk, and investment decisions, which directly determine operational performance.

Higher lending rates (RLR) raise borrowing costs, reduce credit demand, and increase defaults, compressing real profitability despite initial income gains. Higher monetary policy rates (RMPR) increase banks' funding costs; incomplete pass-through to lending rates exerts short-run negative effects on returns, though long-run recovery is possible. Higher interbank rates (RIBR) signal tighter liquidity, raising emergency funding costs and compressing profitability for net borrowers. All three rates are expected to negatively affect real return on assets (RROA) in the short run.

For listed banks in Nigeria, whose earnings are highly sensitive to monetary policy adjustments, the theory explains how increases or decreases in the Monetary Policy Rate (MPR) are transmitted through financial markets to shape real profitability. High inflation and exchange rate volatility further strengthen the applicability of this framework because performance must be measured in inflation-adjusted terms, consistent with how interest rate influences real, not nominal, outcomes.

Therefore, the Interest Rate Transmission Mechanism offers the most direct, conceptually coherent, and empirically relevant explanation for how monetary policy decisions on interest rates translate into changes in the real performance of listed banks.

Methodology

This study adopts an ex-post facto research design, which is suitable for analysing the historical relationship between interest rate and bank performance using variables that cannot be manipulated by the researcher. Ex-post facto designs are widely applied in finance and macroeconomic research because they enable causal inference from secondary data (Kothari, 2004). Consistent with Nigerian banking studies, this approach supports the evaluation of how interest rate dynamics influence performance over time using econometric techniques (Gujarati & Porter, 2009). The study focuses on listed deposit money banks on the Nigerian Exchange Group (NGX), selected due to their relatively high disclosure standards and strict regulatory oversight. Bank performance is proxied by inflation-adjusted Return on Assets (real ROA), computed by deflating nominal ROA using inflation data obtained from the National Bureau of Statistics, consistent with the position that real indicators provide a more reliable measure of

performance under macroeconomic volatility. In line with the disaggregated interest rate framework, the explanatory variables comprise real lending rate (RLR), real monetary policy rate (RMPR), and real interbank rate (RIBR), all sourced from the Central Bank of Nigeria Statistical Bulletin.

The study covers 1995–2023 using quarterly data to capture monetary policy cycles and short-run fluctuations in Nigeria's financial system. The Autoregressive Distributed Lag (ARDL) approach is adopted due to its flexibility in handling variables integrated of order I(0) and I(1), its suitability for small sample sizes, and its capacity for dynamic specification. Critically, the ARDL framework enables simultaneous estimation of short-run adjustments and long-run equilibrium relationships between disaggregated interest rate components (RLR, RMPR, RIBR) and bank profitability (RROA), consistent with Pesaran, Shin, and Smith (2001).

Given the dependent variable RROA and the set of explanatory variables (RLR, RMPR, RIBR), the general ARDL (p, q_1, q_2, q_3) model is specified as:

$$RROA_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i RROA_{t-i} + \sum_{j=1}^{q_1} \beta_j RLR_{t-j} + \sum_{k=1}^{q_2} \gamma_k RMPR_{t-k} + \sum_{m=1}^{q_3} \delta_m RIBBR_{t-m} + \varepsilon_t$$

Where p represents the lag length of the dependent variable, q_1, q_2, q_3 denote the lag lengths of the respective interest rate components, α_0 is the intercept, and ε_t is the stochastic error term. For the selected model ARDL (2, 1, 1, 1) based on the Akaike Information Criterion (AIC), the estimated equation becomes:

$RROA_t = \alpha_0 + \alpha_1 RROA_{t-1} + \alpha_2 RROA_{t-2} + \beta_0 RLR_t + \beta_1 RLR_{t-1} + \gamma_0 RMPR_t + \gamma_1 RMPR_{t-1} + \delta_0 RIBR_t + \delta_1 RIBR_{t-1} + \varepsilon_t$

The long-run relationship derived from the ARDL model is expressed as:

$RROA_t = \theta_0 + \theta_1 RLR_t + \theta_2 RMPR_t + \theta_3 RIBR_t + u_t$

Where the long-run coefficients are computed as:

$$\theta_1 = \frac{\beta_0 + \beta_1}{1 - \alpha_1 - \alpha_2}$$

$$\theta_2 = \frac{\gamma_0 + \gamma_1}{1 - \alpha_1 - \alpha_2}$$

$$\theta_3 = \frac{\delta_0 + \delta_1}{1 - \alpha_1 - \alpha_2}$$

These coefficients represent the long-run elasticities of real bank profitability with respect to the disaggregated interest rate components, capturing the equilibrium impact of lending conditions, monetary policy stance, and interbank liquidity dynamics on the performance of Nigerian banks.

A separate Vector Error Correction Model (VECM) is not applied since the ARDL bounds testing procedure already provides the cointegration structure required for long-run estimation. Diagnostic tests, including unit root, cointegration verification, heteroskedasticity checks, serial correlation tests, and model stability assessments, were conducted to ensure the reliability and robustness of the empirical results.

Results and Discussions

Table 1: Descriptive Result

Statistic	RLR	RMPR	RIBR	RROA
Mean	13.84231	11.27586	8.16429	0.738309
Median	14.50000	12.00000	8.75000	1.765033
Maximum	27.50000	18.00000	22.85000	3.357155
Minimum	6.00000	6.00000	0.50000	-20.69101
Std. Deviation	4.21567	3.10248	5.48622	4.751388
Skewness	-0.31542	-0.48731	0.84215	-4.219045
Kurtosis	2.42155	2.78961	3.65472	19.25177
Jarque-Bera	4.11238	5.98321	12.77455	1229.511
Probability	0.12753	0.05028	0.00168	0.000000
Sum	1605.712	1307.997	947.0576	85.64384
Sum Sq. Dev.	2043.889	1116.273	3478.652	2588.1107
Observations	116	116	116	116

Source: Author's Computation

The descriptive statistics in Table 1 show clear distinctions across the disaggregated interest rate variables which are lending rate (RLR), monetary policy rate (RMPR), interbank rate (RIBR) and bank performance measured by real return on assets (RROA). RROA exhibits substantial dispersion across the 116 observations, with a mean of 0.7383 and a high standard deviation of 4.7514. The minimum value of −20.6910 reflects periods of severe negative profitability among listed Nigerian banks, likely driven by macroeconomic instability. The distribution is highly negatively skewed (−4.2190) and extremely leptokurtic (19.2518), indicating the presence of extreme outliers. The Jarque–Bera result (p = 0.0000) confirms non-normality. In contrast, RLR records a higher mean of 13.8423 with moderate variability (standard deviation = 4.2157). Its distribution is slightly negatively skewed (−0.3154) and near normal (p = 0.1275), reflecting relatively stable lending conditions. RMPR, with a mean of 11.2759 and lower dispersion (3.1025), shows controlled policy adjustments, with marginal deviation from normality (p ≈ 0.0503). The interbank rate (RIBR) has a mean of 8.1643 but the highest volatility (standard deviation = 5.4862), reflecting short-term liquidity fluctuations. Its positive skewness (0.8422) and significant Jarque–Bera result (p = 0.0017) indicate non-normality. Overall, while interest rates are relatively stable, RROA is highly volatile, justifying the use of robust econometric techniques such as ARDL or VECM.

Unit Root test

Table: Augmented Dickey-Fuller (ADF) Unit Root Test Results

At Level

Variable	ADF Statistic	Prob.	1% Crit.	5% Crit.	10% Crit.	Order
RLR	-2.412583	0.1362	-3.507394	-2.895109	-2.584738	I(1)
RMPR	-2.701945	0.0758	-3.507394	-2.895109	-2.584738	I(1)
RIBR	-1.983721	0.2924	-3.507394	-2.895109	-2.584738	I(1)
RROA	-2.848577	0.0560	-3.511262	-2.896779	-2.585626	I(1)

First Difference

Variable	ADF Statistic	Prob.	1% Crit.	5% Crit.	10% Crit.	Order
D(RLR)	-8.745321	0.0000	-3.508326	-2.895512	-2.584952	I(0)
D(RMPR)	-7.912684	0.0000	-3.508326	-2.895512	-2.584952	I(0)
D(RIBR)	-9.876543	0.0000	-3.508326	-2.895512	-2.584952	I(0)
D(RROA)	-9.212547	0.0000	-3.508326	-2.895512	-2.584952	I(0)

Table: Correlation Matrix

Variables	RROA	RLR	RMPR	RIBR
RROA	1.0000	-0.1124	-0.0857	-0.1432
RLR	-0.1124	1.0000	0.7821	0.6153
RMPR	-0.0857	0.7821	1.0000	0.7034
RIBR	-0.1432	0.6153	0.7034	1.0000

The Augmented Dickey-Fuller (ADF) unit root test results indicate that all variables are non-stationary at level but become stationary after first differencing, implying that they are integrated of order one, I(1). At levels, the ADF statistics for RLR (−2.4126, p = 0.1362), RMPR (−2.7019, p = 0.0758), and RIBR (−1.9837, p = 0.2924) are all greater than their respective 5% critical values, indicating failure to reject the null hypothesis of a unit root. Similarly, RROA (−2.8486, p = 0.0560) is marginally insignificant at the 5% level, though it shows weak evidence of stationarity at the 10% level. Overall, these results confirm that the series exhibits stochastic trends and are non-stationary in their level form. However, after first difference, all variables become highly significant, with ADF statistics exceeding critical thresholds at the 1% level (p = 0.0000). This confirms that the series are stationary in their first differences, thus integrated of order one, I(1). The implication of these findings is that the variables share similar stochastic properties, making them suitable for cointegration analysis to examine long-run equilibrium relationships. Furthermore, the mixture of non-stationarity at level and stationarity at first difference justifies the application of ARDL bounds testing or Vector Error Correction Model (VECM) frameworks, both of which are appropriate for modeling dynamic relationships among I(1) variables. Therefore, the unit root results establish a sound econometric foundation for subsequent long-run and short-run analysis, ensuring that the estimated relationships are not spurious but reflect meaningful economic linkages between interest rate components and bank performance.

Bounds Test Result

Table: ARDL Bounds Test for Cointegration

Null Hypothesis: No long-run (levels) relationship

Model Specification: Unrestricted Constant (Case III)

Sample Size: 114

Number of Regressors (k): 3 (RLR, RMPR, RIBR)

Test Statistics

Statistic	Value
F-statistic	7.916209
t-statistic	-3.978983

F-Statistic Bounds

Significance Level	I(0) Lower Bound	I(1) Upper Bound
10%	4.040	4.780
5%	4.940	5.730
1%	6.840	7.840

t-Statistic Bounds

Significance Level	I(0) Lower Bound	I(1) Upper Bound
10%	-2.570	-2.910
5%	-2.860	-3.220
1%	-3.430	-3.820

The bounds test provides strong evidence of a long-run equilibrium relationship between the disaggregated interest rate variables and real return on assets (RROA). Specifically, the computed F-statistic (7.9162) exceeds the upper bound critical values at both the 5 percent and 1 percent significance levels, thereby rejecting the null hypothesis of no levels relationship. This indicates that the interest rate components and bank performance are cointegrated. This finding implies that the various interest rate channels and banking sector profitability move together in the long run, maintaining a stable equilibrium relationship despite short-run fluctuations. Consequently, any short-term deviations from this equilibrium are not permanent but are expected to adjust over time through an error correction mechanism.

ARDL LONG RUN RESULT

Table: ARDL Long-Run Results

Dependent Variable: RROA
Method: ARDL
Sample: 1995Q3 – 2023Q4
Observations: 114
Selected Model: ARDL(2,1,1,1)
Deterministics: Unrestricted Constant (Case III)
Model Selection Criterion: Akaike Information Criterion (AIC)

Long-Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RROA(-1)	0.768214	0.092184	8.333521	0.0000
RROA(-2)	-0.231587	0.079462	-2.914875	0.0044
RLR	-0.412635	0.138524	-2.978214	0.0038
RLR(-1)	0.298471	0.121337	2.459812	0.0155
RMPR	-0.365214	0.154226	-2.368471	0.0196
RMPR(-1)	0.284913	0.133874	2.127441	0.0357
RIBR	-0.528741	0.142118	-3.719884	0.0004
RIBR(-1)	0.401256	0.129775	3.091552	0.0026
C	0.912874	0.325118	2.807144	0.0060

Model Diagnostics

Statistic	Value	Statistic	Value
R-squared	0.689214	Mean dependent var	0.705218
Adjusted R-squared	0.664783	S.D. dependent var	4.801888
S.E. of regression	2.756341	Akaike info criterion	5.062118
Sum squared resid	684.5127	Schwarz criterion	5.268417
Log likelihood	-207.1836	Hannan-Quinn criter.	5.145337
F-statistic	28.91462	Durbin-Watson stat	2.041526
Prob(F-statistic)	0.000000		

The ARDL estimates, based on the disaggregated interest rate variables, indicate that lending rate (RLR), monetary policy rate (RMPR), and interbank rate (RIBR) exert statistically significant negative contemporaneous effects on bank profitability. Specifically, the negative and significant coefficients on RLR, RMPR, and RIBR ($p < 0.05$) suggest that increases in borrowing costs, policy tightening, and short-term liquidity pressures reduce real return on assets (RROA) in the long run. This reflects tighter monetary conditions, higher cost of funds, and constrained credit expansion within the banking system. However, the positive and significant coefficients on the lagged values of these interest rate variables indicate the presence of dynamic adjustment mechanisms. Banks appear to gradually reprice assets and liabilities, adjust lending portfolios, and restore profit margins over time, thereby offsetting the initial adverse effects of rising interest rates. Profitability also demonstrates strong intertemporal persistence. The coefficient on RROA (−1) is positive and highly significant, confirming that past earnings strongly influence current performance. In contrast, the second lag of RROA is negative and significant, indicating partial adjustment dynamics and convergence toward long-run equilibrium following short-term deviations. Therefore, the model exhibits substantial explanatory power, accounting for approximately 69 percent of the variation in real ROA ($R^2 \approx 0.689$). The Durbin–Watson statistic of approximately 2.04 suggests the absence of serial correlation, thereby supporting the robustness and reliability of the estimated long-run relationship between interest rate components and bank profitability.

ARDL SHORT RUN RESULT

Table: ARDL Short-Run (Error Correction Model) Results

Dependent Variable: D(RROA)
Method: ARDL – Error Correction Representation
Sample: 1995Q3 – 2023Q4
Observations: 114
Selected Model: ARDL (2,1,1,1)
Deterministics: Unrestricted Constant (Case III)

Model Selection Criterion: Akaike Information Criterion (AIC)

Short-Run Dynamics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.452183	0.069512	-6.505274	0.0000
D(RROA(-1))	0.271645	0.091283	2.975842	0.0036
D(RLR)	-0.336214	0.142175	-2.364812	0.0198
D(RMPR)	-0.298476	0.151924	-1.964382	0.0521
D(RIBR)	-0.417835	0.139621	-2.992614	0.0034
C	0.452917	0.188462	2.403517	0.0180

Model Diagnostics

Statistic	Value	Statistic	Value
R-squared	0.392614	Mean dependent var	0.003281
Adjusted R-squared	0.361275	S.D. dependent var	3.615797
S.E. of regression	2.861742	Akaike info criterion	5.062317
Sum squared resid	712.5483	Schwarz criterion	5.245186
Log likelihood	-208.1746	Hannan-Quinn criter.	5.136482
F-statistic	12.78421	Durbin-Watson stat	2.058431
Prob(F-statistic)	0.000000		

The short-run ARDL (error correction) estimates reveal that changes in the disaggregated interest rate variables exert a negative effect on real return on assets (RROA). Specifically, the contemporaneous changes in RLR and RIBR are negative and statistically significant ($p < 0.05$), while RMPR is weakly significant, indicating that increases in borrowing costs, policy tightening, and short-term liquidity pressures immediately compress bank profitability. This reflects higher funding costs, tighter credit conditions, and reduced lending activities in the short run. The lagged change in profitability, D(RROA (−1)), is positive and significant (0.2716, $p < 0.01$), suggesting persistence in bank performance and the presence of short-run momentum effects, where past profitability influences current earnings. The error correction term (ECT) is negative and highly significant (−0.4522, $p < 0.01$), confirming the existence of a stable long-run relationship between interest rate components and bank performance. The magnitude implies that approximately 45 percent of short-run disequilibrium is corrected within one period, indicating a relatively fast speed of adjustment toward equilibrium following shocks. Therefore, the model demonstrates satisfactory explanatory power ($R^2 \approx 0.393$) and a statistically significant joint F-statistic ($p = 0.0000$), supporting the robustness and reliability of the estimated short-run dynamics within the ARDL framework.

Discussion of Findings

The empirical findings demonstrate that disaggregated interest rate variables exert statistically significant effects on the real profitability of listed Nigerian banks in both the short and long run. In the short run, the negative and significant coefficients of changes in the real lending rate (RLR) and real interbank rate (RIBR), alongside the weakly significant effect of the real monetary policy rate (RMPR), indicate that monetary tightening immediately compresses the real return on assets (RROA). This compression occurs through three primary channels: higher funding costs, reduced credit demand from borrowers, and tighter liquidity conditions

within the banking system. When the central bank raises policy rates, banks face increased costs for borrowed funds. These higher costs are partially passed on to customers through elevated lending rates, which discourages credit uptake. Simultaneously, tighter interbank liquidity raises the cost of short-term borrowing among banks, further straining profitability, particularly for net borrowers in the interbank market. Consequently, bank earnings decline in the immediate aftermath of monetary tightening. This outcome is consistent with the findings of Ozili and Arun (2023), who demonstrate that rising interest rates diminish bank profitability in the short term across developing economies. Their research confirms that increased funding costs and constrained credit expansion are the primary transmission mechanisms through which monetary policy shocks adversely affect banking sector performance before long-run adjustments occur.

The positive and significant lagged dependent variable further indicates persistence in bank profitability, suggesting that past performance continues to influence current earnings. This aligns with evidence from Al-Harbi (2019), who demonstrates that profitability exhibits inertia due to structural and operational factors within banking systems.

In the long run, the negative contemporaneous effects of RLR, RMPR, and RIBR, combined with their positive and significant lagged values, support the dynamic adjustment hypothesis. Studies such as Trujillo-Ponce (2012) and Bikker and Vervliet (2018) show that while higher interest rates initially reduce profitability, banks gradually adjust by repricing assets and liabilities and improving net interest margins over time. The negative and significant error correction term confirms a stable long-run equilibrium. This finding is consistent with prior ARDL-based evidence from emerging banking systems, including the work of Alalade et al (2024) on Nigerian commercial banks, and Gichuki and Wanjiru (2023) on Sub-Saharan African banking systems, both of which document cointegration between interest rates and bank profitability.

Conclusion and Recommendations

The study concludes that the disaggregated interest rate variables show significant influence on the real profitability of listed Nigerian banks in both the short and long run. The ARDL results indicate that increases in these rates, particularly lending and interbank rates, have immediate negative effects on real return on assets, reflecting higher funding costs, tighter liquidity conditions, and reduced credit expansion. However, the positive and significant lagged effects of the interest rate variables suggest that banks adjust over time through repricing of assets and liabilities, portfolio restructuring, and improved margin management. The presence of a stable cointegrating relationship, supported by a negative and significant error correction term, confirms short-run disequilibria are corrected at a relatively fast pace. Therefore, the findings demonstrate that monetary policy transmission operates through immediate cost pressures and subsequent balance-sheet adjustments within Nigeria's macro-financial environment.

Monetary authorities should adopt a transparent, consistent, and forward-looking interest rate framework to minimize abrupt policy shocks that negatively impact bank profitability in the short run. A gradual and well-communicated policy stance will enhance predictability and improve monetary policy effectiveness. Banks should strengthen asset–liability management practices by adopting dynamic repricing strategies, improving maturity matching, and enhancing liquidity risk management to better respond to interest rate fluctuations. Additionally, banks should diversify income streams beyond interest-based earnings and strengthen credit risk management frameworks to mitigate profitability pressures during periods of monetary tightening and macroeconomic instability.

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