UNSYSTEMATIC RISK AND FINANCIAL PERFORMANCE OF LICENSED DEPOSIT MONEY BANKS IN NIGERIA: DOES INFLATION MATTER?

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Abstract

Rapid macroeconomic instability and recurring inflationary pressures in Nigeria have raised concerns about how external shocks interact with bank-specific risks to influence the stability and profitability of financial institutions. This study examined the moderating effect of inflation on the relationship between unsystematic risk and the financial performance of Deposit Money Banks (DMBs) in Nigeria from 2010 to 2024. Unsystematic risk was proxied by Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Cost-to-Income Ratio (CIR), while Return on Assets (ROA) measured financial performance. Secondary data from 13 licensed banks were analyzed using panel regression techniques in Stata, with Capital Adequacy Ratio (CAR), Asset Size (AST), and Gross Domestic Product (GDP) as control variables. The results reveal that NPL, LDR, and CIR have significant negative effects on ROA. However, inflation and its interaction terms were statistically insignificant, showing that inflation does not significantly moderate these relationships. The findings confirm the trade-off theory of risk and return and the macroeconomic risk theory, highlighting those internal bank-specific risks exert stronger influence on profitability than external inflationary shocks. The study recommends that banks strengthen credit monitoring, optimize liquidity structures, improve operational efficiency through digitalization, and regulators enforce adequate capitalization and inflation control measures to enhance the resilience and performance of Nigerian banks.

Keywords: unsystematic risk, financial performance, inflation, deposit money banks

1.0   Introduction

Deposit Money Banks (DMBs) are the backbone of financial intermediation in Nigeria, channeling savings to productive investment, enabling payments, and transmitting monetary policy. In recent years, the Nigerian banking sector witnessed significant balance-sheet expansion, but from 2023 onward the operating environment became markedly more challenging. A combination of exchange-rate adjustments, the removal of fuel subsidies, and a surge in consumer prices produced sharp macroeconomic disruptions that affected banks' asset quality, profitability, and capital positions (Central Bank of Nigeria, 2024; National Bureau of Statistics [NBS], 2024). Despite some headroom in short-term liquidity metrics, industry indicators such as non-performing loans (NPLs) and return-on-assets (ROA) signaled stress. Industry NPLs were reported close to prudential thresholds (around 4.8–4.9% in late 2024), while profitability and capital adequacy faced pressure from valuation losses and rising cost of funds (Central Bank of Nigeria, 2024; NDIC, 2023). Policymakers responded with heightened supervisory attention and publicized moves to strengthen capital buffers, underscoring the policy salience of bank resilience in the face of macro shocks (Financial Times, 2024).

Understanding the determinants of bank financial performance in this environment requires attention not only to systematic, economy-wide shocks but also to bank-specific — or unsystematic — risks. Unsystematic risk in banking captures idiosyncratic exposures that originate within a bank's balance sheet or operations, such as credit-portfolio deterioration concentrated in certain sectors, provisioning and credit-loss management practices, operational failures or inefficiencies, funding structure idiosyncrasies, and managerial or governance weaknesses. Empirical studies routinely operationalize these idiosyncratic sources using accounting-based proxies when market data are limited or when the research emphasis is on internal risk drivers. Common measures include the NPL ratio and loan-loss provisions (to capture credit-quality and provisioning risk), volatility of profitability such as the standard deviation of ROA (to capture earnings instability), cost-to-income ratios and non-interest expense metrics (to proxy operational inefficiency), and capital measures (equity/assets or regulatory capital ratios) that indicate buffer strength against idiosyncratic losses (Fiordelisi, Marques-Ibanez, & Molyneux, 2011; Louzis, Vouldis, & Metaxas, 2012). Composite stability indices, notably the Z-score, also combine profitability, capitalization, and earnings volatility to provide a summary gauge of insolvency probability and bank-level fragility.

Among these idiosyncratic exposures, credit risk, liquidity risk, and operational risk constitute the most prominent components of unsystematic risk in Nigerian banks, each exerting direct pressure on performance and stability. Credit risk arises from the potential default of borrowers, and evidence indicates a deterioration in credit quality in recent years: by 2024, NPLs among the top eight banks rose to ₦2.59 trillion from ₦1.9 trillion in 2023, lifting the industry's average NPL ratio from 3.82% to 4.99% (THISDAY, 2025). Loan impairment charges also escalated, with Nigerian listed banks collectively recording about ₦3.77 trillion in loan losses between 2023 and Q1 2025 (Business Times, 2025), thereby weakening profitability and capital adequacy. Liquidity risk, reflected in banks' ability to meet short-term obligations, has intensified as institutions increasingly relied on costly short-term funding due to inflationary pressures and tighter monetary policy (CBN, 2024). Loan-to-deposit ratios (LTDRs), often surpassing the 65% prudential guideline in 2023–2024, signal structural mismatches that studies confirm undermine

ROA and resilience (Ogunbiyi & Sanyaolu, 2023; Njms Study, 2025). At the same time, operational risk defined by Basel as losses from failed processes, people, systems, or external events has become more pressing amid rising staff costs, cyber-security threats, compliance burdens, and technology investments. The persistently high cost-to-income ratio (CIR) among several banks illustrates efficiency constraints, with recent evidence showing a significant negative impact of CIR on ROA between 2014 and 2023 (Njms, 2025). Inflation compounds these vulnerabilities by escalating funding and operating costs, thereby magnifying unsystematic risks across Nigeria's banking sector.

Inflation therefore acts as a macroeconomic amplifier of unsystematic risk. By weakening borrowers' repayment capacity, inflation worsens credit risk; by raising funding costs, it intensifies liquidity risk; and by increasing operating expenses, it magnifies operational risk. This dynamic is especially concerning in Nigeria, where headline inflation hovered around 29.9% in January 2025 (NBS, 2025), one of the highest in Africa. The surge in both price levels and inflation volatility places unprecedented stress on bank-specific risk drivers, with direct consequences for financial performance indicators such as ROA, return on equity (ROE), and net interest margin (NIM).

In this context, studying how unsystematic risk (credit, liquidity, and operational risks) shapes the financial performance of Nigerian DMBs under high inflation conditions is both timely and policy-relevant. While past studies have considered aggregate risk exposures, fewer have isolated these three drivers as the primary channels of unsystematic risk in Nigeria's inflationary environment. This study fills that gap by employing bank-level accounting data to examine how inflation interacts with credit, liquidity, and operational risk, and how these risks ultimately affect financial performance.

2.0   Literature Review and Hypothesis Development

This section reviews the findings of prior studies and hypotheses formulation

2.1 Bank Performance

Bank performance is a multidimensional construct that encompasses financial profitability, operational efficiency, innovation capacity, and long-term sustainability. According to Brogi, Lagasio and Zamparo (2022), bank performance reflects not only financial outcomes such as return on assets (ROA) and return on equity (ROE), but also the institution's ability to integrate environmental, social, and governance (ESG) considerations into its business strategy. This broader view aligns with the global shift toward sustainable finance, where performance is evaluated in terms of both profitability and social responsibility. Similarly, El Khoury, Nasrallah, and Alareeni (2021) emphasize that performance should incorporate qualitative elements such as reputation, stakeholder trust, and compliance with sustainability standards. In this sense, bank performance is increasingly linked to the ability of banks to balance short-term profitability with long-term resilience and responsible governance.

From a technological perspective, bank performance is viewed through the lens of digital transformation and innovation. Phan et al. (2020) define performance in this context as a bank's capability to leverage financial technologies—such as artificial intelligence, blockchain, and

mobile banking—to enhance efficiency, customer satisfaction, and profitability. Boot, Hoffmann, Laeven, and Ratnovski (2021) add that the emergence of FinTech and BigTech competitors has redefined performance by introducing new benchmarks for speed, personalization, and cost-effectiveness in financial services. Consequently, digital readiness and adaptability have become critical indicators of performance in modern banking. Acharya, Engle, and Pierret (2023) further argue that technological agility contributes to financial stability by improving risk monitoring and predictive analytics, thus enabling banks to navigate volatile macroeconomic environments more effectively.

In the regulatory and macroeconomic context, contemporary scholars define bank performance as the outcome of strategic and policy alignment in an increasingly complex environment. Klein (2022) posits that regulatory frameworks such as Basel III have reshaped performance by emphasizing capital adequacy, liquidity management, and risk-based supervision. These measures, while enhancing systemic stability, have also pressured banks to innovate in order to maintain profitability. Furthermore, Acharya et al. (2023) highlight that recent inflationary trends and monetary tightening have tested banks' ability to sustain performance amid rising credit risks and shifting interest rate dynamics. Overall, modern conceptualizations converge on the understanding that bank performance is holistic and adaptive, encompassing financial strength, technological innovation, sustainable governance, and resilience to economic and regulatory shifts.

2.2 Unsystematic Risk

Unsystematic risk in banks is defined as the firm-specific exposures that arise from bank management decisions, lending practices, internal processes and controls — risks that are idiosyncratic to the institution and therefore (in principle) diversifiable across the financial system (Chen & Pan, 2012; Hussain, 2022). Prior studies emphasized that unsystematic risk should be analyzed as a set of linked but distinct dimensions (credit, liquidity, operational), because each dimension has different drivers, observables and managerial levers even though they interact in practice. Empirical and policy discussions therefore commonly rely on accounting proxies (NPL ratio, LDR, CIR) to operationalize these conceptual dimensions while acknowledging the proxies' backward-looking nature and potential measurement heterogeneity across banks and jurisdictions (Chen & Pan, 2012; Hussain, 2022).

Credit risk is rooted in borrower default and counterparty creditworthiness; in banking studies the NPL ratio is the dominant proxy used to capture credit quality and default risk (Arhinful, 2025; Sewanyina, 2025). It is argued that NPLs are outcome of past lending decisions and an economic signal of current credit-cycle stress; they therefore function as a measure of realized credit deterioration and an indirect signal of future lending capacity via provisioning and capital effects (Ozili, 2019; Arhinful, 2025). Studies stressed two important caveats: accounting rules, loan classification practices and regulatory forbearance affect measured NPLs; and NPLs are lagging indicators that may understate incipient credit stress unless paired with forward-looking indicators and early-warning models (Sewanyina, 2025; Nwosu, Okedigba, & Anih, 2020).

Liquidity risk is the capacity to meet cash and collateral obligations without undue cost. Loan-to-deposit ratio (LDR) is widely used as a simple balance-sheet proxy of asset-liability transformation risk (Adenuga et al., 2021). The literature frames LDR as a behavioral measure:

high LDRs may indicate aggressive lending and thin deposit cushions (increasing rollover and funding risk), whereas low LDRs can reflect under-utilized intermediation capacity and depressed profitability — producing a policy debate about what constitutes an "optimal" LDR range for different bank business models (Adenuga et al., 2021; Erhijakpor, 2024). Critiques highlight that LDR is a coarse indicator because it abstracts from the composition, tenor and stability of deposits, off-balance sheet funding and access to market liquidity; thus studies recommend combining LDR with other indicators (stable deposit share, maturity mismatch metrics, liquidity coverage ratios) and with stress-testing frameworks for forward-looking liquidity assessment (Adenuga et al., 2021).

Operational risk is the loss arising from failed processes, people, systems, or external events; the cost-to-income ratio (CIR) is often used as a readily available efficiency proxy that correlates with operational fragility (Hull, 2015; Ayinuola & Gumel, 2023). Conceptually, CIR captures recurring operational inefficiency (high operating expenses relative to income), and it is both a performance metric and an indirect indicator of operational risk exposures (e.g., inadequate controls, legacy IT, high manual processing) that can produce losses and reputational damage. Studies emphasized that CIR is endogenous to strategic choices (outsourcing, digital investment) and capital structure (larger banks can sustain higher CIRs for strategic reasons), so interpretation of CIR as "operational risk" requires contextualization by bank size, business mix and one-off restructuring items (Ayinuola & Gumel, 2023; Naburg, 2025).

2.3 Moderating Role of Inflation

Studies revealed that inflation interacts with unsystematic risk factors to influence bank performance, particularly in developing economies such as Nigeria. Conceptually, inflation affects both the real and nominal channels of bank operations by eroding the real value of deposits, increasing uncertainty in loan contracts, and raising provisioning requirements due to higher expected credit losses (Umar, 2014; Chioma & Adanma, 2020). Empirical evidence indicates that inflation can either enhance or diminish profitability depending on whether banks can reprice assets faster than liabilities (Beck et al., 2013; Maijamaa, Adamu, & Umar, 2014). In Nigeria, studies have found that while moderate inflation may improve profitability when effectively managed, high or volatile inflation typically reduces return on assets through increased costs, higher non-performing loans, and operational inefficiencies (Andabai, 2024; Chioma & Adanma, 2021). Thus, inflation's impact on bank performance is state-dependent that is amplified during periods of policy tightening and economic instability (Reuters, 2025).

Inflation also moderates the effect of unsystematic risks on bank outcomes. Evidence shows that inflation intensifies the adverse impact of non-performing loans on profitability by weakening borrower repayment capacity and increasing default rates (Atoi, 2018; Nwosu, Okedigba, & Anih, 2020). Similarly, rising inflation affects liquidity risk by eroding depositors' real balances and increasing the loan-to-deposit ratio, which weakens liquidity stability and constrains bank performance (Adenuga et al., 2021). Moreover, inflation raises operating expenses such as wages and utilities, thereby worsening operational risk and elevating the cost-to-income ratio (Ayinuola & Gumel, 2023). Integrated Nigerian studies show that during inflationary periods, the interaction between these risks generates spillover effects that magnify financial instability (Unilag, 2025). Consequently, researchers and policymakers emphasize the need for inflation-

sensitive risk management strategies and macroprudential buffers to stabilize the banking sector in inflationary environments (Atoi, 2018; Adenuga et al., 2021).

According to financial intermediation theory, banks can only function efficiently when there's price stability, which allows for accurate assessments of deposits, loans, and risks. However, inflation disrupts this balance by distorting real interest rates and the true value of financial contracts. This distortion hampers the effectiveness of credit screening, loan pricing, and risk management (Huybens & Smith, 1999; Boyd & Smith, 2001). In times of high inflation, borrowers experience a drop in their real incomes while their nominal loan obligations increase, which raises the likelihood of defaults and heightens credit and liquidity risks (Apergis, Christou & Miller, 2020). Additionally, inflation drives up operational and funding costs, making it difficult for banks to monitor borrowers and adjust their portfolios effectively (Demirgüç-Kunt, Martinez Peria & Tressel, 2020).

2.4 Conceptual Framework

The conceptual framework in figure 1 explains that unsystematic (bank-specific) risks directly influence the financial performance (ROA) of Deposit Money Banks, while inflation was expected to modify the strength or direction of those effects within Nigeria's macroeconomic environment. Non-Performing Loans (NPL) capture credit risk, Loan-to-Deposit Ratio (LDR) reflects liquidity risk and lending pressure, and Cost-to-Income Ratio (CIR) measures operational inefficiency, all of which are theorized to reduce profitability when elevated. Inflation serves as a moderating variable because it affects interest rates, borrowers' repayment capacity, and banks' operating costs, potentially amplifying or dampening the impact of these internal risks on ROA. To isolate these relationships, Capital Adequacy Ratio (CAR) (financial strength), Asset Size (AST) (scale and diversification effects), and Gross Domestic Product (GDP) (overall economic conditions) are included as control variables influencing bank performance. The framework is adapted from established bank risk–performance and macroeconomic influence models in the banking literature (Aryal & Singh, 2024).
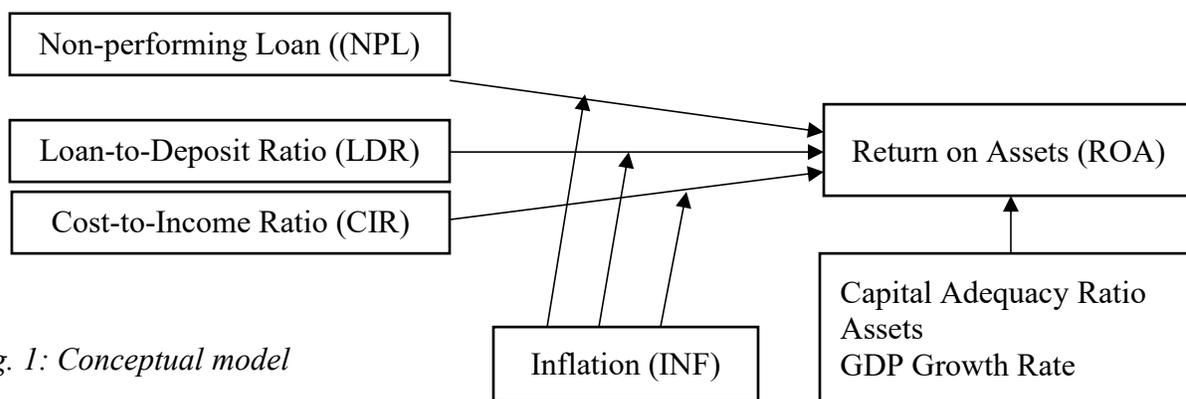

Fig. 1: Conceptual model

2.5 Theoretical Review

Trade-Off Theory of Risk and Return and Macroeconomic Risk Theory underpin the study. According to the trade-off theory, banks can enhance returns by assuming certain levels of risk, but excessive exposure to credit risk (NPLs), liquidity risk (LDR), or operational risk (CIR) can undermine profitability and financial stability (Acharya et al., 2023; Myers, 2001). Meanwhile,

macroeconomic risk theory highlights that inflation influences this dynamic by impacting real earnings, borrowers' repayment ability, and operating costs thereby intensifying the adverse effects of unsystematic risks during periods of high or volatile inflation, while mitigating them when inflation is low and stable (Adenuga et al., 2021; Atoi, 2018; Nwosu et al., 2020). Therefore, these theories collectively suggest that bank performance depends on effective internal risk management, with inflation acting as a moderating factor that can either amplify or reduce the influence of unsystematic risks on profitability, efficiency, and stability.

2.6 Review of Empirical Studies

Studies usually capture unsystematic risk through indicators such as non-performing loans (NPL), loan-to-deposit ratio (LDR), and cost-to-income ratio (CIR) mainly because these variables are easy to obtain from bank accounts and have been shown to explain profitability and stability reasonably well in country-specific studies (Nwosu et al., 2020; Ayinuola & Gumel, 2023; Atoi, 2018). While this approach is practical, it has led to a narrow research tradition in which these risks are often examined in isolation and treated as having the same effect across all economic conditions.

Most Nigerian studies focus on credit risk. In addition to Nwosu et al. (2020) and Adeleke (2023), evidence from Atoi (2018), Salami and Afolayan (2022), and Ogunleye et al. (2021) consistently shows that rising NPLs reduce bank profitability, largely due to weak credit screening, heavy exposure to a few sectors, and vulnerability to oil-price and exchange-rate shocks. However, these studies usually estimate average effects over long periods, assuming that the impact of bad loans on bank performance is constant over time. In a country like Nigeria, where inflation, exchange rates, and monetary policy shift sharply, this assumption is unrealistic. What remains unexplored is whether NPLs become more damaging to bank profitability when inflation is high and borrowers' real incomes are falling.

A similar pattern appears in the liquidity-risk literature. Studies such as Adenuga et al. (2021), Uche and Iheduru (2020), and the CBN (2021) show that extreme values of the loan-to-deposit ratio are linked to greater earnings volatility and capital stress. Yet LDR is usually treated either as a simple linear variable or as a regulatory compliance measure. In reality, the same LDR can be relatively safe in a low-inflation environment with stable deposits, but highly risky during inflationary periods when deposits become volatile and funding costs rise. This macroeconomic conditioning of liquidity risk is largely missing from existing Nigerian studies.

Operational risk, captured by the cost-to-income ratio, has also attracted attention as banks invest more in digital platforms and face rising compliance and energy costs. Ayinuola and Gumel (2023), Olarewaju et al. (2017), and Adegbite and Machethe (2021) all show that higher CIR reduces profitability, especially for smaller and mid-tier banks. However, these studies treat cost inefficiency as if it has the same effect in all periods. They do not examine whether inflation-driven increases in wages, energy prices, and technology costs make high CIR more damaging to profits, which is a serious omission in an inflation-prone economy like Nigeria.

Studies provide strong evidence that NPL, LDR, and CIR matter for bank performance, but little is said about how macroeconomic conditions shape these effects. Most studies rely on static models that produce average relationships and ignore how inflation may amplify or weaken the

impact of bank-specific risks. This is a major gap because it cannot explain why similar levels of credit, liquidity, or operational risk lead to mild outcomes in some periods but severe banking stress in others. Treating inflation as a moderating variable directly addresses this weakness and is particularly important in Nigeria, where price instability is persistent and economically significant.

3.0   Methodology

This section constitutes the study design as well as the methodology used to accomplish the desired objectives of the study.

3.1 Research Design

The study adopted longitudinal research design to seek answer on why and how inflation explains the relationship between unsystematic risk and financial performance of licensed deposit money banks in Nigeria.

3.2 Population of the Study

The study population consisted of 35 deposit money banks licensed to provide banking service in Nigeria. These banks are as presented in the table below:

TABLE 1: List of Licensed Deposit Money Banks

S/N	Bank	S/N	Bank
1	Access Bank Plc	19	WEMA Bank
2	Fidelity Bank Plc	20	Premium Trust Bank
3	First City Monument Bank Plc	21	PROVIDUS Bank
4	First Bank of Nigeria Plc	22	Optimus Bank
5	Guarantee Trust Bank Plc	23	Parallex Bank
6	United Bank of Africa Plc	24	Suntrust Bank
7	Zenith Bank Plc	25	Signature Bank
8	CitiBank Nigeria Ltd	26	Jaiz Bank
9	EcoBank	27	Taj Bank
10	Globus Bank	28	Lotus Bank
11	Keystone Bank	29	Alternative Bank Ltd
12	Polaris Bank	30	Coronation Merchant Bank
13	Stanbic IBTC Bank	31	FBN Merchant Bank
14	Standard Chartered Bank	32	FSDH Merchant Bank
15	Sterling Bank	33	Greenwich Merchant Bank
16	Titus Trust Bank	34	NOVA Merchant Bank
17	Union Bank of Nigeria	35	RAND Merchant Bank
18	Unity Bank		

Source: Central Bank of Nigeria, 2025

3.3 Sample

The study sample consists of deposit money banks operating under commercial banking license (international, national, or regional) in Nigeria that published continuous audited annual financial statements between 2010 and 2024. Merchant banks, non-interest banks, holding companies, and

representative offices were excluded due to fundamental differences in business models, risk structures, and reporting frameworks. These banks are as presented in the table below.

TABLE 2: List of Sampled Deposit Money Banks

S/N	Bank	S/N	Bank
1	Access Bank Plc	8	EcoBank
2	Fidelity Bank Plc	9	Keystone Bank
3	First City Monument Bank Plc	10	Stanbic IBTC Bank
4	First Bank of Nigeria Plc	11	Sterling Bank
5	Guarantee Trust Bank Plc	12	Union Bank of Nigeria
6	United Bank of Africa Plc	13	Unity Bank
7	Zenith Bank Plc		

Source: Central Bank of Nigeria, 2025

3.4 Methods of Data Collection and Analysis

Data for the study were obtained primarily from secondary sources, specifically the annual financial reports of the selected banks covering the period 2010–2024. For the analysis, the study employed a panel data regression approach using Stata version 15. Descriptive statistics and correlation matrices were generated to examine the characteristics of the dataset and assess the direction and strength of the relationships among the variables. The dataset was also tested for normality to evaluate its distributional properties. Furthermore, the study conducted three types of panel regressions: pooled ordinary least squares (OLS), fixed effects (FE), and random effects (RE), all estimated using the generalized least squares (GLS) method. To ensure robustness and the validity of the results, several diagnostic tests were performed, including checks for heteroskedasticity, multicollinearity, and autocorrelation, as well as the Hausman specification test and the Breusch-Pagan Lagrangian Multiplier (LM) test. These tests were used to identify the most appropriate model for analysis and to confirm that the estimated model met the necessary statistical assumptions.

3.5 Mathematical Model

The analytical regression model that tested and estimated the effect of Unsystematic Risk on Financial Performance of licensed Deposit Money Banks in Nigeria using Inflation as moderator is as follows:

$$ROA = \beta_0 + \beta_1 NPL_{it} + \beta_2 LDR_{it} + \beta_3 CIR_{it} + \beta_4 INF_{it} + \beta_5 CAR_{it} + \beta_6 AST_{it} + \beta_7 GDP_{it} + \varepsilon_{it}$$

The model with moderator (inflation) is as follows

$$ROA = \beta_0 + \beta_1 NPL_{it} + \beta_2 LDR_{it} + \beta_3 CIR_{it} + \beta_4 INF_{it} + \beta_5 (NPL * INF)_{it} + \beta_6 (LDR * INF)_{it} + \beta_7 (CIR * INF)_{it} + \beta_8 CAR_{it} + \beta_9 AST_{it} + \beta_{10} GDP_{it} + \varepsilon_{it}$$

Where:
NPL: Nonperforming Loan
LDR: Loan-to-Deposit Ratio
CIR: Cost-to-Income Ratio

INF: Inflation
CAR: Capital Adequacy Ratio
AST: Assets
GDP: GDP Growth Rate
$\beta_0 - \beta_{10}$: Coefficients
ε : Stochastic error term

3.6 Measurement of Variables

This section specifies how each construct employed in the study is operationalized and quantified to ensure empirical precision, replicability, and theoretical consistency.

TABLE 3: Measurement of Variables

Variable	Definition & Measurement	Unit/Formula	Supporting Citations
Non-Performing Loan (NPL)	Proportion of loans that are not being repaid as scheduled (loans overdue or impaired), capturing credit quality and risk.	*NPL Ratio = Non-performing Loans ÷ Total Loans × 100*	Anjum, M. (2024).
Loan-to-Deposit Ratio (LDR)	Ratio of total loans to total deposits; indicator of liquidity and credit extension relative to deposit funding.	*LDR = Total Loans ÷ Total Deposits × 100*	Erhijakpor, A. E. O. (2024)
Cost-to-Income Ratio (CIR)	Efficiency measure showing how much operating cost is incurred per unit of operating income; higher values indicate lower efficiency.	*CIR = Operating Expenses ÷ Operating Income × 100*	Hussain, A. (2022)
Inflation (INF)	Annual percentage change in a broad price index (e.g., Consumer Price Index), reflecting general price level changes.	*INF = ($CPI_t - CPI_{t-1}$) ÷ CPI_{t-1} × 100*	Naburg, M. M. (2025)
Capital Adequacy Ratio (CAR)	Regulatory capital relative to risk-weighted assets; an indicator of solvency and ability to absorb losses.	*CAR = (Tier 1 + Tier 2 Capital) ÷ Risk-Weighted Assets × 100*	Klein, M. (2022)
Assets (AST)	Total economic resources controlled by a bank; often log-transformed for regression normalization.	*AST: Natural log of Total Assets (for analytics)*	Williams, T. (2021)
GDP Growth Rate	Annual percent change in real Gross Domestic Product; captures economic expansion or contraction.	*GDP Growth = (Real GDP_t − Real GDP_{t-1}) ÷ Real GDP_{t-1} × 100*	Andabai, P. W. (2024)

4.0   Data Analysis, Results and Discussion

Table 4 presents the descriptive statistics for the variables used in the study, based on 195 observations. The average Return on Assets (ROA) is 0.67% with a standard deviation of 1.48%, indicating moderate variability in bank profitability across the sample. Non-Performing Loans

(NPL**)** have a mean of 10.31% and a relatively high standard deviation of 14.74%, suggesting significant differences in credit risk management among banks. The Loan-to-Deposit Ratio (LDR) averages 54.58%, implying that, on average, banks lend out slightly more than half of their deposits, with values ranging widely between 31.98% and 110.02%. Cost-to-Income Ratio (CIR) shows a mean of 57.04%, reflecting moderate operational efficiency levels across banks. The mean Inflation Rate (INF) over the period is 19.66%, with fluctuations between 7.98% and 34.19%, pointing to a relatively high inflationary environment in Nigeria. Capital Adequacy Ratio (CAR) averages 17.29%, indicating that banks are generally well-capitalized, while Bank Size (AST), measured as the logarithm of total assets, has a mean of 17.22 with modest dispersion. Finally, Gross Domestic Product (GDP) growth averages 2.02%, ranging from -1.97% to 8.99%, showing periods of both economic contraction and expansion during the study period. Overall, the statistics reveal substantial variation across banks and macroeconomic indicators, providing a strong basis for panel data analysis.

Table 4: Descriptive Statistics

Variables	Obs.	Mean	Std. Dev.	Min	Max
ROA (%)	195	0.6689	1.4751	1.8000	12.5400
NPL (%)	195	10.3115	14.7419	0.0000	97.0000
LDR (%)	195	54.5849	14.8242	31.9800	110.0230
CIR (%)	195	57.0395	11.6747	37.2000	79.7567
INF (%)	195	19.6605	6.4249	7.9800	34.1900
CAR (%)	195	17.2857	4.1895	10.1911	44.9101
AST (log)	195	17.2249	1.4967	15.0006	19.9923
GDP (%)	195	2.0224	2.4978	-1.9729	8.9936

Source: STATA Output

Table 5 presents the regression results examining the direct relationship between selected bank-specific and macroeconomic variables and Return on Assets (ROA) for Nigerian commercial banks. The model, estimated using Pooled OLS based on the Breusch-Pagan Lagrangian (Prob = 0.3153) and Hausman test (Prob = 0.9912), shows that the pooled model is appropriate. The R-squared value of 0.8923 and adjusted R-squared of 0.8882 indicate that approximately 89% of the variation in ROA is explained by the independent variables. The F-statistic (221.29, p = 0.000) confirms the overall model significance. The results reveal that Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), Cost-to-Income Ratio (CIR), and Inflation (INF) negatively and significantly affect ROA, implying that higher credit risk, operational inefficiency, and inflation reduces profitability. Conversely, Capital Adequacy Ratio (CAR), Asset Size (AST), and Gross Domestic Product (GDP) exhibit positive and significant effects, suggesting that stronger capitalization, larger asset bases, and economic growth enhance banks' profitability. Furthermore, all VIF values are below 10, indicating no multicollinearity problem among the predictors.

Table 5: Regression Result of Direct Relationship

	Dependent Variable: ROA			Multicollinearity	
	Co-eff.	T	P>|t|	VIF	Tolerance
NPL	-0.1263161	-7.47	0.000	1.03	0.951850
LDR	-0.0465288	-19.40	0.000	1.01	0.965897
CIR	-0.0776868	-25.19	0.000	1.03	0.966746
INF	-0.0301944	-5.35	0.000	1.05	0.972828
CAR	0.1040172	12.10	0.000	1.04	0.977446
AST	0.1792244	7.56	0.000	1.00	0.991353
GDP	0.1630186	11.37	0.000	1.02	0.996785
Cons	4.946126	9.64	0.000		
R-squared	0.8923				
Adj. R-squared	0.8882				
F-Statistics	221.29				
F-sig (p-value)	0.0000				
Hausman Test (Prob.)	0.9912				
Hausman (Chi-square)	1.19				
BP Lagrangian (Prob)	0.3153				
BP Lagrangian (Chi-sq)	0.23				
Model Selection	Pooled OLS				
Total Observation	195				

Source: STATA Output

Table 6 presents the moderated regression results examining the effect of non-performing loans (NPL), loan-to-deposit ratio (LDR), cost-to-income ratio (CIR), and their interaction with inflation (INF) on the return on assets (ROA) of Nigerian banks. The model explains about 89.25% of the variation in ROA (R^2 = 0.8925; Adj. R^2 = 0.8867), and the overall model is statistically significant (F = 152.83, p < 0.001). The results indicate that NPL (-0.1217, p = 0.024), LDR (-0.0511, p < 0.001), and CIR (-0.0774, p < 0.001) have significant negative effects on ROA, suggesting that higher levels of these risk indicators reduce bank profitability. However, inflation (INF) and all interaction terms (NPL×INF, LDR×INF, and CIR×INF) are statistically insignificant (p > 0.05), implying that inflation does not significantly moderate the relationship between these variables and bank performance. The control variables—CAR (0.1037, p < 0.001), AST (0.1786, p < 0.001), and GDP (0.1632, p < 0.001)—exert significant positive effects on ROA, implying that well-capitalized banks with larger assets and operating in growing economies tend to be more profitable. Diagnostic tests (Hausman p = 1.0000; BP Lagrangian p = 0.3108) indicate that the Pooled OLS model is appropriate for this analysis and that there is no evidence of random effects or significant heterogeneity among the banks.

Table 6: Moderated Regression Result

	Dependent Variable: ROA			Multicollinearity	
	Co-eff.	T	P>|t|	VIF	Tolerance

NPL	-0.1217338	-2.27	0.024	10.21	0.097912
LDR	-0.0510824	-7.04	0.000	9.12	0.109689
CIR	-0.0773533	-7.94	0.000	10.17	0.098345
INF	-0.0460662	-1.11	0.267	55.64	0.017971
NPL_INF	-0.0002435	-0.09	0.927	18.95	0.052780
LDR_INF	0.0002468	0.67	0.507	35.41	0.028244
CIR_INF	-0.000189	-0.04	0.969	44.51	0.022467
CAR	0.1037272	11.88	0.000	1.05	0.949957
AST	0.1785833	7.45	0.000	1.01	0.986477
GDP	0.1631818	11.29	0.000	1.03	0.974624
Cons	5.254635	5.44	0.000		
R-squared	0.8925				
Adj. R-squared	0.8867				
F-Statistics	152.83				
F-sig (p-value)	0.0000				
Hausman Test (Prob.)	1.0000				
Hausman (Chi-square)	0.36				
BP Lagrangian (Prob)	0.3108				
BP Lagrangian (Chi-sq)	0.24				
Model Selection	Pooled OLS				
Total Observation	195				

Source: STATA Output

4.1 Hypothesis Testing and Discussion

The first hypothesis (H_{01}) stated that unsystematic risk has no significant effect on the financial performance of licensed Deposit Money Banks (DMBs) in Nigeria. The regression results in Table 6 show that Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Cost-to-Income Ratio (CIR) exert significant negative effects on Return on Assets (ROA), with coefficients of -0.1217 (p = 0.024), -0.0511 (p < 0.001), and -0.0774 (p < 0.001), respectively. Therefore, H_{01} is rejected, confirming that higher levels of credit, liquidity, and operational risk significantly reduce bank profitability. These results align with prior studies such as Nwosu et al. (2020), Adenuga et al. (2021), and Ayinuola & Gumel (2023), who reported similar findings for Nigerian banks.

The second hypothesis (H_{02}) posited that inflation does not significantly moderate the relationship between unsystematic risk and financial performance. Inflation (INF) and its interaction terms (NPL×INF, LDR×INF, CIR×INF) were statistically insignificant (p > 0.05), suggesting no moderating effect. Thus, H_{02} is accepted, implying that inflation does not alter the magnitude or direction of the impact of unsystematic risk on ROA. This finding contrasts with Atoi (2018) and Chioma & Adanma (2021), who found that inflation magnified credit and operational risk effects in earlier, less capitalized periods. However, it may reflect banks' improved inflation-hedging strategies and enhanced risk management frameworks post-2015 reforms.

The significant positive coefficients of control variables—CAR (0.1037, $p < 0.001$), AST (0.1786, $p < 0.001$), and GDP (0.1632, $p < 0.001$) further corroborate the trade-off and macroeconomic risk theories, indicating that well-capitalized and larger banks operating in expanding economies are better positioned to withstand idiosyncratic shocks.

5.0   Conclusion and Recommendations

This study shows that the financial performance of Nigerian deposit money banks is driven mainly by how well they manage their own internal risks rather than by inflation itself. High non-performing loans, weak liquidity management, and poor cost control all reduce profitability, while strong capital buffers, larger asset bases, and a growing economy support better performance. Inflation, although high, does not change how these risks affect profitability, suggesting that Nigerian banks have learned to operate in an inflation-prone environment. The study contributes to theory by showing that bank-specific risks like bad loans, poor liquidity management, and high operating costs matter more for profitability than inflation, refining how risk–return and macroeconomic risk theories apply in developing economies. Based on these findings, banks should focus less on trying to predict inflation and more on tightening credit screening, strengthening loan recovery systems, keeping loan-to-deposit ratios within safe limits, and cutting operating costs through technology and process improvement. Regulators should reinforce these efforts by closely monitoring credit quality, enforcing realistic provisioning and capital standards, and discouraging excessive risk-taking, so that banks remain profitable and resilient even when economic conditions are unstable. Although the results are empirically strong, a number of limitations affect how broadly the findings can be interpreted. Inflation was measured using Consumer Price Index, a general indicator that does not account for differences in price movements across sectors and regions that directly influence borrowers and bank costs. The pooled OLS approach also assumes that all banks behave in the same way over time, while the use of ROA and a sample of only 13 listed banks limit insight into risk-adjusted performance, financial stability and wider system behaviour. Therefore, future studies should use more detailed inflation measures, dynamic or non-linear modeling techniques for analysis, and broader samples and performance metrics to better capture how bank-specific risks interact with macroeconomic instability in Nigeria.

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