

# LOAN MANAGEMENT RATIOS AND FINANCIAL PERFORMANCE (FP) OF DEPOSIT MONEY BANKS (DMBs) IN NIGERIA

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## ABSTRACT

This study explored how loan management ratios affect the FP of DMBs in Nigeria from 1994 to 2024. Key indicators examined include the Non-Performing Loan Ratio (NPLR), Loan-to-Deposit Ratio (LDR), Loan Loss Provision Ratio (LLPR), and Coverage Ratio (CR), with Return on Assets (ROA) as the measure of profitability. The research is grounded in theories such as Agency Theory, Credit Risk Theory, and Financial Intermediation Theory, among others. Using an ex-post facto design and secondary data from the Central Bank of Nigeria (CBN) and Nigeria Deposit Insurance Corporation (NDIC), the study applies Ordinary Least Squares (OLS) multiple regression through E-Views 10.0. Diagnostic tests for unit root, multicollinearity, autocorrelation, heteroskedasticity, and normality were conducted to ensure robustness. Results show that NPLR, LDR, and CR have positive and significant effects on ROA, while LLPR has an insignificant impact. This suggests that while non-performing loans typically indicate risk, banks may maintain profitability through higher interest margins. Effective loan intermediation and strong coverage ratios also support better returns. However, provisions for loan losses, although crucial for long-term stability, may not show immediate benefits to profit levels. The study concludes that improving loan management can boost FP in the sector. It recommends enhanced risk management, better lending practices, and sufficient capital buffers. These findings provide long-term empirical insights and offer useful guidance for bank managers, policymakers, and regulators.

**Key Words:** Loan, Management, Non-Performing Loan, Loan-to-Deposit, Loan Loss Provision, and Return on Assets.

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## 1.0 INTRODUCTION

The FP of DMBs in Nigeria is strongly influenced by their loan management practices. Key ratios; Non-Performing Loan Ratio (NPLR), Loan-to-Deposit Ratio (LDR), Loan Loss Provision Ratio (LLPR), and Coverage Ratio (CR) served as vital indicators of credit risk and banking efficiency. These ratios affect ROA, a core measure of profitability.

A high NPLR indicates a larger share of loans in default, which weakens earnings. In the first half of 2023, four major Nigerian banks recorded ₦478 billion in non-performing loans—a 16% year-on-year increase (Pulse Nigeria, 2023). Although high NPLs usually reduce ROA, banks may offset these losses through increased interest margins. To curb rising defaults, the CBN introduced the Global Standing Instruction (GSI) in 2020, which allows banks to recover overdue debts from defaulters' accounts across institutions (Pulse Nigeria, 2023; Akpokerere & Edefiaje, 2024). The LDR indicates how effectively banks convert deposits into income-generating loans. A moderate LDR promotes income growth, while an excessively high ratio can expose banks to liquidity shortfalls. In 2024, the CBN revised the minimum LDR requirement from 65% to 50% to reduce liquidity pressure amid monetary tightening (The Guardian Nigeria, 2024).

LLPR reflects the reserves banks hold for expected loan losses. While higher provisions increase

stability, they can reduce funds available for lending, which may negatively affect ROA (Adeleke et al., 2023). The Coverage Ratio (CR), which compares provisions to non-performing loans, strengthens investor confidence and indicates resilience. A high CR helps shield profitability from credit risk (Awogbemi et al., 2023; Edafiaje & Akpokerere, 2024). ROA is shaped by the interaction of these ratios. For example, while a higher LDR may raise income, it also increases risk. Likewise, strong provisioning improves safety but may reduce net income. Effective credit risk management that balances these ratios is associated with better financial outcomes (Oladele & Akinwumi, 2024). In 2023, FCMB Group Plc reported a 147.8% rise in profit before tax, driven partly by a 37.4% increase in loans and advances, showing the potential gains from well-managed lending (FCMB Group Plc, 2023).

Ultimately, aligning loan management with risk control and regulatory policies is crucial for boosting profitability and stability in Nigeria's banking sector.

## 1.1 Statement of the Problem

The FP of DMBs in Nigeria is heavily influenced by their loan management practices, particularly through key indicators such as the NPLR, LDR, LLPR, and CR, with ROA serving as a common measure of performance. Despite their critical role in Nigeria's economy, many banks continue to face challenges from high levels of NPLR, which threaten profitability and financial stability. Poor loan management can lead to reduced returns and increased risk of distress. While several studies have examined loan-related metrics and financial outcomes, many are either outdated, limited in scope, or fail to account for the interaction of multiple loan management ratios (Aliyu & Hassan, 2021; Apochi & Baffa, 2022; Uddin, 2022). Moreover, the effects of LLPR and CR on ROA remain underexplored in the Nigerian context, and existing research often lacks methodological rigor, such as the use of panel data to address unobserved heterogeneity (Siyanbola & Adebayo, 2021; Lamidi et al., 2022). Nigeria's unique economic and regulatory environment—including recent monetary policy shifts and oil market fluctuations—further necessitates a localized and updated analysis (Makwe et al., 2024; Mustapha & Adejuwon, 2025). In light of these gaps, this study investigates how NPLR, LDR, LLPR, and CR influence the FP of Nigerian DMBs, as measured by ROA, aiming to provide evidence-based insights for improving credit risk practices and boosting profitability in the sector.

## 1.2 Objectives of the Study

The main objective of this study is to examine the effect of loan management ratios on the FP of DMBs in Nigeria. The specific objectives are:

1. To analyze the effect of NPLR on the ROA of selected DMBs in Nigeria.
2. To examine the influence of LDR on the FP of DMBs in Nigeria.
3. To assess the impact of LLPR on the profitability of DMBs in Nigeria.
4. To investigate the effect of CR on the ROA of DMBs in Nigeria.

## 1.3 Research Hypotheses

**H<sub>01</sub>:** NPLR has no significant effect on the ROA of DMBs in Nigeria.

**H<sub>02</sub>:** LDR has no significant influence on the FP of DMBs in Nigeria.

**H<sub>03</sub>:** LLPR has no significant impact on the profitability of DMBs in Nigeria.

**H<sub>04</sub>:** CR has no significant effect on the ROA of DMBs in Nigeria.

## **2.0 REVIEW OF RELATED LITERATURE**

### **2.1 Conceptual Review**

#### **2.1.1 Loan Management Ratios**

Loan management is a fundamental aspect of banking operations, involving the strategies and processes used to oversee and maintain healthy loan portfolios. At the heart of this process are loan management ratios—quantitative tools that help banks assess different dimensions of their lending performance. These ratios offer valuable insights into credit risk, liquidity, profitability, and overall financial stability. By analyzing these indicators, financial institutions can identify potential weaknesses, allocate resources more efficiently, and make data-driven decisions that support both short-term performance and long-term sustainability (Akpokerere & Onatuyeh, 2023).

These ratios serve as benchmarks for evaluating how well a bank is managing its loan activities and the risks involved. They not only reflect the quality of the loan portfolio but also highlight areas that may require corrective action. For example, high levels of non-performing loans may indicate poor credit screening or economic stress, while an imbalanced loan-to-deposit ratio could signal liquidity risks. Regular monitoring of loan management ratios is crucial for maintaining regulatory compliance, investor confidence, and operational resilience. In essence, these metrics are vital tools that help banks strike a balance between profitability and prudence in their lending practices (Akpokerere & Onatuyeh, 2023).

#### **2.1.2 Non-Performing Loan Ratio (NPLR)**

The NPLR is a critical measure of asset quality and credit risk in banks, reflecting loans overdue by 90 days or more. High NPLRs undermine profitability by increasing provisioning needs and reducing lending capacity. Empirical studies across Nigeria, Europe, and Asia consistently show a negative relationship between NPLR and FP (Ijuwo, 2024; Thornton & Tommaso, 2021; Reuters, 2024). In Nigeria, regulatory efforts like the Global Standing Instruction (GSI) have helped lower NPLR below the 5% benchmark (CBN, 2023). Maintaining a low NPLR is essential for financial stability and sustainable bank performance.

#### **2.1.3 Loan-to-Deposit Ratio (LDR)**

The LDR measures a bank's liquidity by comparing loans to deposits, indicating how effectively it uses customer funds. An optimal LDR balances lending and liquidity, while extremes may signal risk or inefficiency. In Nigeria, the Central Bank adjusted the LDR from 65% to 50% in 2024 to encourage prudent risk management (Omaplex Law Firm, 2024). Studies show mixed effects of LDR on profitability, often depending on asset quality and economic conditions (Awaluddin et al., 2023; Larasati & Syaipudin, 2024). Overall, maintaining a balanced LDR is essential for stability, profitability, and effective banking operations.

#### **2.1.4 Loan Loss Provision Ratio (LLPR)**

The LLPR measures the share of a bank's loan portfolio reserved for potential defaults, playing a key role in risk management and financial stability. A strong LLPR protects earnings and capital, especially during downturns or crises like COVID-19 (Ozili, 2024; Degryse & Huylebroek, 2023). Factors such as institutional quality, income composition, and IFRS 9 adoption influence provisioning behavior. While procyclical provisioning can heighten risk, countercyclical strategies help cushion future losses. Banks must adjust LLPR in response to changing economic, regulatory, and technological conditions to ensure resilience and maintain stakeholder confidence (Basu et al., 2020; Biswas et al., 2024).

#### **2.1.5 Coverage Ratio (CR)**

The CR measures a bank's ability to absorb losses from NPLs using loan loss reserves. A higher CR signals strong risk management but can reduce profitability by diverting funds from income-generating activities. In Nigeria, CR has shown a negative but significant impact on ROA, often reflecting elevated NPL levels (Awogbemi et al., 2023; Ighoroje & Akpokerere, 2021). Regulatory standards like IFRS 9

and ECB guidelines mandate higher provisioning, enhancing stability but pressuring earnings. Banks must balance CR levels, economic conditions, and strategic goals to manage credit risk effectively while sustaining profitability (European Banking Authority, 2020; Alessi et al., 2020).

### **2.1.6 Financial Performance (FP) proxied with Return on Assets (ROA)**

ROA is a key measure of how efficiently banks convert their assets into profit. A higher ROA indicates strong FP and effective asset use. Several loan management ratios influence ROA, including NPLs, LDR, and operational cost ratios. Studies show that high NPLs reduce ROA by increasing provisions and lowering asset quality (Suharyanto et al., 2024; Onatuyeh & Akpokerere, 2023). LDR also affects ROA, with optimal levels supporting profitability, while extremes can signal liquidity or income inefficiencies. Operational efficiency, measured through the BOPO ratio, enhances ROA when banks manage costs well (Florid & Purnamasari, 2023). Other factors such as the CAR, NIM, and macroeconomic shocks also impact ROA. A higher CAR boosts confidence and stability but may reduce ROA if excess capital isn't used efficiently. NIM, which reflects interest income relative to interest expenses, positively affects ROA by improving net earnings (Suharyanto et al., 2024). During the COVID-19 pandemic, banks globally saw drops in ROA due to rising NPLs and loan provisions. In the U.S., ROA fell slightly to 1.09% in 2023 due to higher noninterest expenses (FDIC, 2024); Akpokerere & Onatuyeh, 2023). Similarly, in Europe, ROA rose only after interest rates recovered from historically low levels. These findings highlight the importance of balanced credit risk, operational efficiency, and interest rate management in sustaining profitability, particularly during economic volatility.

## **2.2 Theoretical Review**

### **2.2.1 Credit Risk Theory**

Credit Risk Theory and Financial Intermediation Theory provide a parsimonious theoretical foundation for explaining how credit risk management affects the profitability of deposit money banks in Nigeria. Credit Risk Theory explains that banks face potential losses when borrowers fail to meet contractual loan obligations. Since lending is a major income-generating activity of banks, poor credit quality directly weakens profitability through lost interest income, higher loan-loss provisions, and increased recovery costs. Within this framework, the NPLR is expected to have a negative effect on ROA, because a higher proportion of impaired loans reduce earnings and asset efficiency. LLPR has an ambiguous effect: in the short run, higher provisions may reduce reported profit, but in the long run, adequate provisioning can strengthen bank stability and protect profitability by absorbing expected credit losses. The CR also reflects a trade-off, as higher capital improves solvency and resilience but may reduce profitability if excessive capital limits risk-taking and income-generating lending.

### **2.2.2 Liquidity Preference Theory**

Financial Intermediation Theory complements Credit Risk Theory by explaining banks as institutions that mobilize deposits from surplus units and channel them to deficit units through lending. In this role, banks earn profit by transforming deposits into loans while managing liquidity, credit risk, and capital adequacy. The LDR captures the efficiency of this intermediation process. A higher LDR may positively affect ROA when loans are well managed and generate sufficient interest income. However, the relationship may also be non-linear, because an excessively high LDR can expose banks to liquidity pressure and higher credit risk, while a very low LDR may indicate underutilization of deposits and weak income generation. Therefore, the expected effect of LDR on ROA is positive only up to an optimal level and may become negative when lending becomes excessive or poorly controlled. Thus, the study expects NPLR to negatively affect ROA, LDR to have a positive but conditional or non-linear effect, LLPR to have an ambiguous effect depending on whether provisions represent short-term profit reduction or long-term risk protection, and CR to reflect a stability-profitability trade-off. This framework shows that bank profitability depends not only on expanding credit but also on maintaining prudent credit quality, adequate provisioning, optimal liquidity transformation, and sufficient capital buffers.

### 2.2.3 Empirical Review

Recent literature can be reorganized into three major thematic strands. The first strand focuses on credit risk and profitability. Studies in this area generally examine how non-performing loan ratio (NPLR) affects bank profitability, especially ROA. Ogunwale et al. (2024), Osakwe et al. (2024), and Abdulrauf (2023) reported that NPLR negatively affects profitability, suggesting that poor loan quality reduces interest income, increases impairment charges, and weakens asset returns. However, Iwedi and Onyekachi (2024) found a positive relationship between non-performing loans and ROA, implying that some banks may remain profitable despite rising default risk due to income diversification or stronger earnings from other banking activities. This inconsistency shows that the effect of credit risk on profitability is not uniform and may depend on bank-specific conditions, income structure, regulatory environment, and the period covered.

The second strand relates to liquidity management. Studies under this strand examine how loan-to-deposit ratio (LDR), liquidity ratio, and cash reserve ratio influence profitability. Abdulrauf (2023), Awogbemi et al. (2023), and Efemena and Augustine (2024) found that LDR positively affects ROA, indicating that effective conversion of deposits into loans can improve earnings. In contrast, Ani et al. (2024) reported a negative but insignificant effect of LDR on ROA, suggesting that excessive lending may expose banks to liquidity pressure and credit risk without significantly improving profitability. These mixed findings suggest that LDR may not have a purely linear effect on profitability. Rather, its effect may be conditional on the quality of loans, liquidity buffers, macroeconomic conditions, and the ability of banks to maintain an optimal balance between lending expansion and liquidity safety.

The third strand concerns provisioning behavior and capital buffers. LLPR, coverage ratio, capital adequacy, and cash reserve ratio are used to assess how banks prepare for expected losses and maintain stability. Awogbemi et al. (2023) found that coverage ratio negatively affected ROA, implying that higher provisioning may reduce short-term profitability. Efemena and Augustine (2024) also found that CR had a negative but insignificant effect on ROA, suggesting that stronger buffers may support stability while limiting immediate profit. Conversely, Ani et al. (2024) found that cash reserve ratio had a positive significant effect on ROA, while Tomomewo et al. (2023) found that loan loss provisions had a positive but insignificant effect on NPLs. These results show that provisioning and reserve behavior may have ambiguous effects: they can reduce current earnings but may protect banks from future credit losses.

Overall, prior findings remain inconsistent across NPLR, LDR, LLPR, and CR. While most studies agree that high non-performing loans weaken profitability, some evidence suggests banks may still sustain ROA under certain conditions. Similarly, LDR has been found to be positive, negative, or insignificant, indicating possible non-linearity. Provisioning variables also show mixed effects because they may represent either prudent risk protection or profit-reducing expense recognition. The specific gap, therefore, is that many Nigerian studies rely on static OLS or short-period panel models, with limited attention to long-run dynamics, structural breaks caused by regulatory and macroeconomic shocks, and macro-financial interactions such as inflation, exchange rate volatility, interest rate changes, and banking sector reforms. This creates a need for a more dynamic framework that captures both short-run and long-run effects of credit risk, liquidity management, and provisioning behavior on the profitability of Nigerian deposit money banks.

## 3.0 RESEARCH METHODOLOGY

### 3.1 Research Design

This study uses an ex-post facto design to assess how NPLR, LDR, LLPR, and CR affect ROA in Nigerian banks from 1994 to 2024. The design suits the study's reliance on historical data to explore long-term effects without manipulating variables (Onwumere, 2019).

### 3.2 Population of the Study

The study population includes all 24 licensed DMBs in Nigeria as of 2023 (CBN, 2023). It focuses on those listed on the Nigerian Stock Exchange due to their mandatory publication of audited financial statements, ensuring data reliability and comprehensive representation of the banking sector.

### 3.3 Sample and Sampling Technique

This study purposively selects 24 DMBs that operated consistently from 1994 to 2024 with available financial data. Banks affected by mergers or restructuring were excluded to avoid bias. The sample ensures representativeness and data consistency for valid econometric analysis of Nigeria's banking sector.

### 3.4 Method of Data Collection

The study uses aggregate secondary data from CBN Bank Supervisory and NDIC Annual Reports, covering 1994–2024. It includes NPLR, LDR, LLPR, CR, and ROA, capturing economic cycles and regulatory shifts to analyze how loan management ratios affect the FP of Nigerian DMBs.

### 3.5 Method of Data Analysis

The study applies Ordinary Least Squares (OLS) multiple regression via E-Views 10.0 to analyze how loan management ratios affect financial performance. OLS is selected for its reliability under classical assumptions. To ensure robustness, key diagnostic tests were conducted: Augmented Dickey-Fuller (ADF) for stationarity, Variance Inflation Factor (VIF) for multicollinearity, Breusch-Godfrey for autocorrelation, Breusch-Pagan-Godfrey for heteroskedasticity, and Jarque-Bera for normality of residuals. These tests help confirm the validity of regression assumptions and the accuracy of parameter estimates.

### 3.6 Model Specifications

The study adopts a multiple regression model to investigate the impact of loan management ratios on financial performance, proxied by Return on Assets (ROA). The model is specified as follows:

$$ROA_t = \beta_0 + \beta_1 NPLR_t + \beta_2 LDR_t + \beta_3 LLPR_t + \beta_4 CR_t + \epsilon_t$$

Where:

ROA<sub>t</sub> = Return on Assets at time t (Dependent Variable)

NPLR<sub>t</sub> = Non-Performing Loan Ratio at time t (Independent Variable)

LDR<sub>t</sub> = Loan-to-Deposit Ratio at time t (Independent Variable)

LLPR<sub>t</sub> = Loan Loss Provision Ratio at time t (Independent Variable)

CR<sub>t</sub> = Coverage Ratio at time t (Independent Variable)

$\beta_0$  = Intercept

$\beta_1, \beta_2, \beta_3, \beta_4$  = Coefficients of the independent variables

$\epsilon_t$  = Error term

## 4.0 RESULTS AND DISCUSSION

Time series data consist of observations collected at successive points in time, often at regular intervals, and are widely used in economic and financial research to analyze trends, cycles, and long-term relationships. In the context of banking, time series data help capture the evolving dynamics of key

financial indicators and their impact on performance. This study leverages time series data spanning 30 years (1994–2024) to examine the effect of loan management ratios—NPLR, LDR, LLPR, and CR on the FP of DMBs in Nigeria, measured by ROA. OLS regression is a widely used method for estimating relationships between variables in time series analysis. It provides unbiased and efficient estimates when the underlying assumptions—such as stationarity, no multicollinearity, and homoscedasticity are met. This study employs OLS regression to quantify the impact of loan management ratios on ROA, using diagnostic tests to validate assumptions and ensure result reliability. By applying OLS to long-term time series data, the study aims to uncover consistent patterns and relationships, offering insights into how well-managed lending practices influence profitability in Nigeria’s banking sector.

### 4.1 Descriptive statistics

The descriptive statistics consists of mean, standard deviation, minimum and maximum values associated with the variables under consideration. The descriptive statistics are summarized on Table 1 below;

**Table 1: Descriptive Statistics**

	ROA	NPLR	LLPR	LDR	CR
Mean	1.463079	6.597025	3.065638	64.04023	79.49940
Median	1.592317	6.531693	3.091761	63.84352	79.65288
Maximum	2.595228	10.15843	4.564644	83.52278	100.0000
Minimum	0.696258	3.173440	1.000000	50.00000	60.81229
Std. Dev.	0.464749	1.775982	0.943782	8.708204	9.267322
Skewness	0.245498	0.192515	-0.342632	0.068503	0.214058
Kurtosis	2.654989	2.701005	2.653643	2.311937	3.020680
Jarque-Bera	0.465142	0.306960	0.761502	0.635760	0.237292
Probability	0.792494	0.857718	0.683348	0.727690	0.888122
Sum	45.35546	204.5078	95.03479	1985.247	2464.481
Sum Sq. Dev.	6.479754	94.62340	26.72173	2274.985	2576.498
Observations	31	31	31	31	31

Source: E-VIEW 10.0 Output, 2026.

The descriptive statistics summarize the behavior of key variables over the 31-year period. ROA averaged 1.46% with moderate variation, while NPLR averaged 6.60%, reflecting a notable presence of bad loans. LLPR averaged 3.07%, and the LDR stood at 64.04%, indicating efficient deposit utilization. The CR averaged 79.50%, showing strong risk management. All variables exhibited near-normal distributions, supported by skewness, kurtosis, and Jarque-Bera test results, suggesting the data are suitable for further statistical analysis using parametric methods like OLS regression.

### 4.2 Multicollinearity Test

Since the data for the study are annual time series, the multicollinearity test was conducted to ascertain if the data contained multicollinearity, this is presented in table 2 below;

**Table 2: Variance Inflation Factors Multicollinearity Test**

Variance Inflation Factors			
Date: 01/28/26 Time: 10:36			
Sample: 1994 2024			
Included observations: 31			
	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	1.500878	191.9715	NA
NPLR	0.002646	15.76013	1.032907
LLPR	0.010517	13.80208	1.159564
LDR	0.000112	59.65949	1.048789
CR	0.000114	93.09778	1.208386

Source: E-VIEW 10.0 Output, 2026.

The Variance Inflation Factor (VIF) results confirm no multicollinearity issues among the independent variables, as all centered VIF values are well below the critical threshold of 10. NPLR has a VIF of 1.03, LLPR 1.16, LDR 1.05, and CR 1.21—indicating low intercorrelation. These values suggest that each variable contributes unique information to the regression model. The absence of multicollinearity supports the reliability of the coefficient estimates, making the regression results valid for assessing how loan management ratios influence the FP of DMBs in Nigeria.

### 4.3 Data Validity Test

Since the data are time series data, spanning for 1994-2024 (31years), the validity test was carried out using the Breusch-Godfrey Serial Correlation LM Test, Heteroskedasticity Test: Breusch-Pagan-Godfrey and Ramsey RESET Test in order to ascertain the validity of the data for the analysis. This is presented in Table 3 below;

**Table 3: Data Validity Test**

<b>Breusch-Godfrey Serial Correlation LM Test:</b>				
F-statistic	2.117710	Prob. F(2,24)	0.1422	
Obs*R-squared	4.650118	Prob. Chi-Square(2)	0.0978	
		Durbin-Watson stat	2.023446	
<b>Heteroskedasticity Test: Breusch-Pagan-Godfrey</b>				
F-statistic	0.590224	Prob. F(4,26)	0.6727	
Obs*R-squared	2.580586	Prob. Chi-Square(4)	0.6303	
Scaled explained SS	1.437120	Prob. Chi-Square(4)	0.8377	
		Durbin-Watson stat	2.371080	
<b>Ramsey RESET Test</b>				
Equation: UNTITLED				
Specification: LOGGDP C LOGDD LOGED LOGDSC LOGTD				
Omitted Variables: Squares of fitted values				
	Value	df	Probability	Value
t-statistic	1.167833	25	0.2539	1.167833
F-statistic	1.363835	(1, 25)	0.2539	1.363835
Likelihood ratio	1.646638	1	0.1994	1.646638
Durbin-Watson stat	2.448503			

Source: E-view, 10.0 Outputs, 2026.

The diagnostic tests confirm that the regression model is robust and reliable. The Breusch-Godfrey test and Durbin-Watson statistic (2.02) indicate no serial correlation. The Breusch-Pagan-Godfrey test shows no heteroskedasticity, with all p-values above 0.05. The Ramsey RESET test also supports correct model specification, with no evidence of omitted variable bias. These results validate the model's assumptions—indicating no issues with autocorrelation, heteroskedasticity, or misspecification—thereby supporting the accuracy and credibility of the regression estimates used to assess the effect of loan management ratios on the FP of DMBs in Nigeria.

### 4.4 Correlation Matrix

Correlation matrix actually shows the relation between independent and dependent variables. This tells the degree of correlation between the independent and dependent variables, whether there is moderate or low degree of correlation.

**Table 4: Correlation Matrix for the Independent and Dependent Variables**

	ROA	NPLR	LLPR	LDR	CR
ROA	1.000000				
NPLR	0.639029	1.000000			
LLPR	0.345949	0.408706	1.000000		
LDR	0.655805	0.603164	0.548156	1.000000	
CR	0.602854	0.793343	0.641843	0.712361	1.000000

Source: E-view, 10.0 Outputs, 2026.

The correlation matrix shows significant positive relationships between ROA and NPLR (0.6390), LDR (0.6558), and CR (0.6029), suggesting that better loan management aligns with improved FP. LLPR also shows a mild positive correlation with ROA (0.3459). Strong correlations exist between NPLR and CR (0.7933), and between CR and LDR (0.7124), indicating close links between non-performing loans, coverage, and lending. All correlations remain below 0.80, minimizing concerns about multicollinearity and confirming the suitability of these variables for regression analysis. These findings support the inclusion of all indicators in assessing bank performance.

### 4.5 Normality Test

The normality test is essential in OLS regression as it helps verify one of the key assumptions underlying classical linear regression—that the residuals (or errors) are normally distributed. Therefore, testing for normality (e.g., using the Jarque-Bera test) ensures that the results of the regression are statistically sound and that the conclusions drawn from the model are valid. The outcome is displayed in Figure 1 below:

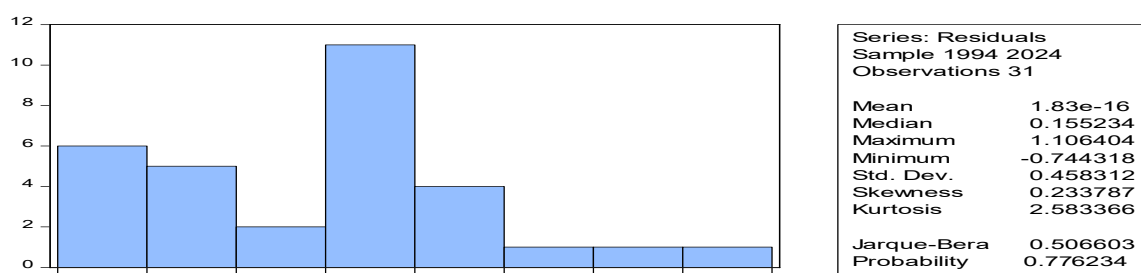


Figure 1: Normality Test (Jarque-Bera Probability Test)

Source: E-VIEW 10.0 Output, 2026.

The Jarque-Bera test confirms that the regression residuals are normally distributed, with a statistic of 0.5066 and a p-value of 0.7762, which exceeds the 0.05 threshold. Thus, the null hypothesis of normality is not rejected. Skewness (0.2338) and kurtosis (2.5834) are close to ideal values, indicating a nearly symmetric distribution. The accompanying histogram also displays a bell-shaped curve centered around the mean. These results satisfy the normality assumption, supporting the reliability of the OLS estimates and ensuring valid statistical inference in the analysis of loan management ratios and bank performance.

### 4.6 Augmented Dickey-Fuller (ADF) Unit Root Test

Testing for the existence of unit roots is a principal concern in the study of time series models and cointegration. The rationale behind this test is to avoid the problem of spurious regression which is commonly associated with time series data. The presence of a unit root implies that the time-series data under investigation is non-stationary; while the absence of a unit root shows that the stochastic process is stationary. The unit root test was conducted using the Augmented Dickey-Fuller (ADF) Unit root test as presented in table 4 below:

**Table 5: Augmented Dickey-Fuller Unit root Test**

Variables	Method	ADF Statistics	Probability	@ Level	Check for Stationary
ROA	ADF Test	12.2321	0.2567	1(0)	Non-Stationary
NPLR	ADF Test	11.7030	0.5130	1(0)	Non-Stationary
LLPR	ADF Test	14.6182	0.7978	1(0)	Non-Stationary
LDR	ADF Test	13.9609	0.8325	1(0)	Non-Stationary
CR	ADF Test	11.6810	0.9266	1(0)	Non-Stationary
Variables	Method	Statistics	Probability	@ 1st Diff.	Check for Stationary
ROA	ADF Test	320.716	0.0000	1(1)	Stationary
NPLR	ADF Test	195.366	0.0000	1(1)	Stationary
LLPR	ADF Test	80.4007	0.0000	1(1)	Stationary
LDR	ADF Test	100.458	0.0000	1(1)	Stationary
CR	ADF Test	96.8369	0.0000	1(1)	Stationary

Source: E-view, 10.0 Outputs, 2026.

The Augmented Dickey-Fuller unit root test results showed that ROA, NPLR, LLPR, LDR, and CR were non-stationary at level because their probability values were greater than 0.05. However, after first differencing, all the variables became stationary with probability values of 0.0000, which are less than 0.05. This indicates that all the variables were integrated of order one,  $I(1)$ , and suitable for further long-run econometric analysis.

#### 4.7 OLS Multiple Regression Analysis

The OLS multiple regression model analyzes how each of the loan management ratios—NPLR, LDR, LLPR, and CR—individually influences ROA. It helps determine both the strength and significance of their effects on the FP of Nigerian DMBs. Full regression outcomes are presented in Table 6.

**Table 6: Regression Result**

Dependent Variable: ROA				
Method: Least Squares				
Date: 01/28/26 Time: 10:35				
Sample: 1994 2024				
Included observations: 31				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.162505	0.167293	6.948904	0.0002
NPLR	0.599365	0.547726	1.094277	0.0275
LLPR	0.212675	1.720727	0.123596	0.2926
LDR	0.307948	0.120673	2.551909	0.0089
CR	0.301304	0.291885	1.032269	0.0243
R-squared	0.027510	Mean dependent var		1.463079
Adjusted R-squared	0.122104	S.D. dependent var		0.464749
S.E. of regression	0.492306	Akaike info criterion		1.567258
Sum squared resid	6.301496	Schwarz criterion		1.798546
Log likelihood	19.29249	Hannan-Quinn criter.		1.642652
F-statistic	0.183874	Durbin-Watson stat		2.537188
Prob(F-statistic)	0.944688			

Source: E-VIEW 10.0 Output, 2026.

The regression results in Table 6 analyze the impact of credit risk indicators—NPLR, LLPR, LDR, and CR—on ROA for Nigerian DMBs from 1994 to 2024. The constant term is positive and significant ( $p = 0.0002$ ), suggesting a baseline ROA of 1.1625 when other variables are zero. Although the model's R-squared (0.0275) and adjusted R-squared (0.1221) indicate modest explanatory power, some individual variables show statistically significant effects, highlighting the partial influence of loan management ratios on financial performance.

The regression shows that NPLR has a positive and significant effect on ROA (coefficient = 0.5994;  $p = 0.0275$ ), leading to the rejection of  $H_{01}$ . This finding supports Iwedi and Onyekachi (2024), who observed a similar trend. However, it also echoes concerns from Bob-Manuel (2023) and Osakwe et al. (2024), who warn that persistent high NPLs threaten long-term profitability and financial stability if not properly managed.

The regression results show that LDR has a positive and significant effect on ROA (coefficient = 0.3079;  $p = 0.0089$ ), leading to the rejection of  $H_{02}$ . Efficient lending boosts profitability, as confirmed by Efemena and Augustine (2024), Abdulrauf (2023), and others. The finding also aligns with Liquidity Preference Theory, stressing the need to balance lending and liquidity. Maintaining an optimal LDR is essential to maximize returns without risking liquidity shortfalls or underutilization of funds.

The LLPR shows a positive but statistically insignificant effect on ROA (coefficient = 0.2127;  $p = 0.2926$ ), so the null hypothesis ( $H_{03}$ ) is not rejected. This implies that provisioning does not significantly impact short-term profitability. The finding is consistent with Adeleke et al. (2023) and Tomomewo et al. (2023), who found similar insignificant effects. It also supports Information Asymmetry Theory, where provisions address borrower uncertainty without necessarily influencing immediate financial outcomes.

The CR shows a significant positive effect on ROA (coefficient = 0.3013;  $p = 0.0243$ ), leading to the rejection of H04. This suggests that stronger loan loss reserves enhance profitability by reinforcing stability and investor confidence. The finding highlights how adequate coverage reduces risk exposure and improves financial outcomes. While this contrasts with Efemena and Augustine (2024), it aligns with Awogbemi et al. (2023), reinforcing that well-capitalized banks can better absorb shocks and maintain strong performance, even if excessive provisioning may sometimes limit short-term gains.

Overall, the regression findings show that NPLR, LDR, and CR each have a significant positive effect on the FP of Nigerian DMBs, as measured by ROA. These results suggest that effective credit risk and liquidity management can enhance profitability. Although LLPR showed a positive but insignificant impact, it still plays a role in long-term risk management. Together, the results highlight the importance of balancing risk control with income generation to sustain FP and stability in the banking sector.

## 5.0 CONCLUSION AND RECOMMENDATIONS

### 5.1 Conclusion

The study concludes that among loan management ratios, NPLR, LDR, and CR significantly influence the FP of DMBs in Nigeria, while LLPR does not. These outcomes highlight the importance of both credit risk management and effective financial intermediation for sustaining profitability. It also underscores that while risk provisions ensure future solvency, their immediate effect on returns may be limited.

### 5.2 Recommendations

The following recommendations are made that:

- 1) Banks should adopt proactive loan monitoring and recovery mechanisms. Regulators must enhance credit reporting systems to reduce the incidence of non-performing loans.
- 2) Banks should strive to maintain optimal LDR levels to maximize lending income without jeopardizing liquidity.
- 3) While LLPR was not statistically significant, banks should not undermine its importance in risk mitigation. Improved provisioning policies should be sustained to buffer against unexpected losses.
- 4) Banks should maintain strong coverage ratios to enhance confidence and long-term profitability. Regulatory bodies can use CR as a benchmark for risk-resilience metrics.

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