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CREDIT RISK MANAGEMENT PRACTICES AND LOAN DEFAULT OF LISTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

Loan default remains a major challenge to banking-sector stability because deterioration in loan quality can weaken profitability, capital adequacy and the capacity of deposit money banks to sustain financial intermediation. This study examines the effect of credit risk management practices on loan default among listed deposit money banks in Nigeria. Specifically, the study investigates the effects of capital adequacy, loan loss provisioning, credit appraisal and monitoring, loan portfolio diversification, and prudential compliance on loan default. The study adopts an ex-post facto research design and uses secondary data obtained from the audited annual reports of ten listed deposit money banks covering 2014–2023, resulting in 100 balanced bank-year observations. Loan default is measured by the Non-Performing Loan Ratio, while Capital Adequacy Ratio, Loan Loss Provision Ratio, Loan-to-Deposit Ratio, Loan-to-Total Asset Ratio and Bank Size constitute the explanatory variables. Fixed Effects regression with bank-level clustered standard errors is employed following the Hausman specification test. The findings show that capital adequacy, loan loss provisioning and loan-to-deposit ratio have positive and statistically significant effects on loan default, while loan-to-total asset ratio has an insignificant effect. Bank size has a negative and significant effect on loan default. The model explains 48.7% of the variation in loan default and is statistically significant. The study concludes that regulatory capital compliance and credit expansion alone are insufficient to control loan default and recommends stronger borrower screening, continuous loan monitoring, forward-looking provisioning and risk-based regulatory supervision.

Keywords: Bank Size; Capital Adequacy; Credit Risk Management; Deposit Money Banks; Loan Default; Non-Performing Loans; Nigeria; Loan Loss Provisioning.

INTRODUCTION

Loan default remains one of the most consequential manifestations of credit risk in the banking industry because the principal business of deposit money banks involves mobilizing funds and extending credit to households, businesses and other economic agents (Ughulu et al., 2023). When borrowers fail to meet their contractual repayment obligations, the resulting deterioration in loan quality can increase impairment charges, weaken bank profitability and capital positions,

constrain subsequent credit creation, and ultimately threaten financial stability. Consequently, the management of non-performing loans has remained a central concern of bank managers, regulators and policymakers, particularly in emerging financial systems where information asymmetry and macroeconomic volatility can intensify borrowers' repayment difficulties (Ijuwo, 2024).

The importance of controlling loan default has increased as banks operate within an environment characterized by changing interest-rate conditions, inflationary pressures, exchange-rate movements and evolving borrower behaviour (Kankpang et al., 2023). These conditions can affect borrowers' cash flows and repayment capacity, thereby increasing the probability that previously performing loans will become impaired. At the same time, advances in financial technology and credit analytics are creating opportunities for banks to improve borrower screening, default prediction and post-loan monitoring through data-driven risk assessment techniques (Rahmani et al., 2024). Thus, effective credit risk management increasingly requires both sound conventional lending controls and the capacity to identify emerging credit deterioration before it becomes reflected in non-performing loan portfolios.

Within emerging economies, the challenge is particularly important because banking institutions often operate in environments characterized by information imperfections, institutional constraints and greater macroeconomic uncertainty. Weak credit appraisal, inadequate monitoring, poor recovery mechanisms and inappropriate loan concentration can increase banks' exposure to default and weaken the effectiveness of financial intermediation. Recent evidence from Nigeria continues to identify credit risk and non-performing loans as important concerns for deposit money banks, demonstrating that improvements in banking regulation do not eliminate the need for effective institution-level credit risk management (Oladele & Akinwumi, 2024).

Nigeria provides an important setting for examining this relationship because deposit money banks play a dominant role in mobilizing financial resources and supplying credit to the economy. The Nigerian banking sector has undergone substantial regulatory and institutional changes intended to strengthen financial stability, improve risk management and enhance banks' capacity to absorb losses (Tomomewo et al., 2023). Nevertheless, empirical evidence continues to show that credit quality remains an important issue within the sector. Recent research on Nigerian listed banks confirms that non-performing loans and credit risk management remain closely connected, although the direction and significance of individual credit-risk indicators vary across studies and model specifications (Ijuwo, 2024).

A particularly important issue concerns the role of capital adequacy in determining loan default. In principle, stronger capital buffers should improve banks' capacity to absorb unexpected credit losses and encourage more prudent risk-taking. However, empirical evidence from Nigerian listed deposit money banks has produced a less straightforward relationship. Tomomewo et al. (2023), for example, found a positive and significant relationship between capital adequacy and non-performing loans, suggesting that better-capitalized banks may possess greater capacity to expand lending and consequently assume additional credit risk. This contrasting theoretical and empirical expectation makes capital adequacy an important variable for further investigation.

Loan loss provisioning represents another important dimension of credit risk management. Adequate provisioning enables banks to recognize potential credit losses and protect their financial position when loans deteriorate (Tomomewo et al., 2023). However, the observed association between provisioning and non-performing loans may be positive because banks tend to increase provisions when evidence of credit deterioration has already emerged. Consequently, the relationship between loan loss provisioning and loan default may reflect both the preventive role of provisioning and its reactive response to deteriorating asset quality. Existing Nigerian evidence has not produced a uniform conclusion on this relationship, reinforcing the need for additional bank-level investigation (Ijuwo, 2024).

Lending intensity also has important implications for loan default. The loan-to-deposit ratio captures the extent to which banks transform mobilized deposits into loans and advances and therefore provides an indication of lending aggressiveness. While increased lending can strengthen financial intermediation and generate additional interest income, excessive credit expansion without commensurate improvements in borrower assessment and monitoring can expose banks to higher default risk. Similarly, the proportion of loans within total assets provides information about the importance of lending activities within a bank's overall asset structure. The Nigerian evidence indicates that these relationships are not necessarily uniform across institutions, making the simultaneous examination of lending intensity and loan portfolio structure particularly relevant (Tomomewo et al., 2023).

Bank size provides an additional institutional dimension to the loan-default question. Larger banks may possess greater financial and technological resources, more specialized risk-management personnel, stronger governance structures and more diversified portfolios, potentially enabling them to manage credit risk more effectively. Conversely, greater institutional size can also create incentives and capacity for more extensive lending and risk-taking. The direction of the relationship is therefore ultimately an empirical question rather than an assumption, and incorporating bank size into the model helps control for important differences in institutional capacity among listed deposit money banks.

Despite the growing literature, an important empirical gap remains. Existing Nigerian studies have frequently examined credit risk management in relation to profitability or broader financial performance rather than treating loan default itself as the principal outcome of interest. Other studies have examined selected credit-risk indicators individually, making it difficult to establish how several dimensions of credit risk management jointly relate to non-performing loans (Oladele & Akinwumi, 2024). For example, recent Nigerian studies have linked credit risk management to bank performance, while studies focusing directly on non-performing loans have employed different samples, periods, variables and estimation approaches (Kankpang et al., 2023; Ijuwo, 2024). The existing evidence is also characterized by differences in study periods and institutional coverage. Tomomewo et al. (2023) examined fourteen listed Nigerian banks over 2013–2022, while Ijuwo (2024) focused on three listed banks over 2008–2022. These differences leave room for additional evidence based on a more focused balanced-panel framework that examines multiple credit-risk management dimensions simultaneously. More importantly, the empirical inconsistencies surrounding capital adequacy, loan loss provisioning and lending-related indicators suggest that the determinants of loan default cannot be assumed to operate uniformly across banking institutions or periods. This study therefore examines the effect of credit risk management practices on loan default among listed deposit money banks in Nigeria.

LITERATURE REVIEW

Loan Default

Loan default represents the failure of a borrower to fulfil agreed contractual obligations relating to the repayment of principal, interest, or both within the stipulated period. In banking research, the incidence of loan default is commonly captured through the Non-Performing Loan Ratio (NPLR), which reflects the proportion of a bank's loan portfolio that has become impaired or is no longer generating expected contractual cash flows. A rising NPL ratio is an important indicator of deteriorating asset quality because persistent loan impairment can increase provisioning requirements, reduce earnings, weaken capital positions and constrain the capacity of banks to extend further credit (Tomomewo et al., 2023; Ijuwo, 2024).

The importance of loan default extends beyond the individual bank because widespread deterioration in asset quality can affect the stability of the wider financial system. When substantial portions of bank credit become non-performing, financial institutions may experience reduced liquidity and profitability, higher credit-loss provisions and greater pressure on regulatory capital. The resulting deterioration in bank balance sheets can constrain financial intermediation and weaken the ability of banks to support productive economic activity (Kankpang et al., 2023; Oladele & Akinwumi, 2024). Thus, controlling loan default is not merely a profitability objective but an important component of banking-sector resilience.

In the Nigerian banking environment, loan default is particularly important because deposit money banks remain major providers of credit to businesses and households. The quality of bank lending is consequently influenced by the effectiveness of borrower assessment, loan monitoring, provisioning, portfolio management and regulatory compliance. Evidence from Nigerian listed banks indicates that credit risk indicators are significantly associated with variations in non-performing loans, although the direction and magnitude of these relationships differ across studies and periods (Tomomewo et al., 2023; Ijuwo, 2024). This inconsistency provides justification for examining loan default within a broader credit-risk management framework rather than attributing changes in NPLs to a single banking indicator.

The measurement of loan default in this study follows the approved thesis framework, where the Non-Performing Loan Ratio is measured as total non-performing loans divided by total loans and advances. This measure provides a direct indication of the proportion of a bank's lending portfolio that has deteriorated in quality and therefore serves as the dependent variable through which the effectiveness of credit risk management practices is assessed.

Capital Adequacy and Loan Default

Capital adequacy represents the extent to which a bank maintains sufficient capital relative to its risk-weighted assets to absorb unexpected losses. It is a fundamental component of prudential banking regulation because adequate capital provides a buffer against credit and other financial risks. In the context of loan default, stronger capitalization may enable banks to withstand credit losses and maintain lending operations during periods of financial stress. However, the relationship between capital adequacy and loan default may also be positive if well-capitalized banks use their stronger balance sheets to expand lending or accept greater credit exposure (Tomomewo et al., 2023).

The Nigerian evidence remains inconclusive. Tomomewo et al. (2023) reported a positive and significant relationship between capital adequacy and non-performing loans among listed Nigerian deposit money banks, suggesting that increased capitalization may coincide with greater credit-risk exposure. This finding contrasts with the conventional expectation that stronger capital buffers should encourage prudent risk-taking. The conflicting evidence makes capital adequacy an important determinant for further empirical examination within the Nigerian banking sector. In this study, capital adequacy is measured using the Capital Adequacy Ratio (CAR), calculated as regulatory capital relative to risk-weighted assets. The variable is expected to capture the extent to which each bank possesses capital capacity to absorb credit-related losses and support its lending activities.

Loan Loss Provisioning and Loan Default

Loan loss provisioning refers to the recognition of amounts set aside by banks to absorb anticipated losses arising from deterioration in the quality of their loan portfolios. Effective provisioning is important because it allows banks to recognize credit losses before they materially erode financial resources. Under the expected-credit-loss orientation of modern financial reporting, provisioning is increasingly expected to incorporate forward-looking assessments of borrowers' creditworthiness rather than relying exclusively on losses that have already occurred. The relationship between loan loss provisioning and loan default, however, can be interpreted in two ways. On one hand, adequate provisioning may strengthen banks' capacity to absorb losses and therefore support more effective credit-risk management. On the other hand, higher provisioning may be a consequence of deteriorating loan quality because banks increase provisions when borrowers show signs of repayment difficulties. A positive relationship between provisioning and NPLs may therefore indicate that provisioning responds to existing credit deterioration rather than necessarily causing it.

Previous Nigerian evidence supports the importance of this relationship but does not establish a uniform direction across different settings. Tomomewo et al. (2023) found that loan loss provisioning was significantly associated with non-performing loans among listed Nigerian banks, highlighting the importance of provisioning practices in explaining variations in asset quality. The present study therefore treats loan loss provisioning as an important dimension of credit risk management and evaluates its independent relationship with loan default. Consistent with the approved thesis, loan loss provisioning is operationalized through the Loan Loss Provision Ratio (LLPR), measured relative to the bank's loan portfolio.

Credit Appraisal, Monitoring and Loan Default

Credit appraisal and monitoring constitute critical stages in the management of credit risk because the quality of lending decisions depends on the bank's ability to assess borrower capacity before disbursement and monitor repayment performance thereafter. Effective appraisal involves evaluating the borrower's financial position, repayment capacity, collateral, credit history and other relevant risk characteristics, while monitoring enables the bank to identify early signs of financial distress and initiate corrective action before a loan becomes non-performing. Weak credit appraisal can expose banks to adverse selection, whereby borrowers with relatively high default risk obtain credit because lenders lack sufficient information to distinguish them from lower-risk borrowers. Similarly, inadequate post-disbursement monitoring can create moral-hazard problems by allowing borrowers to divert funds from their intended purposes or undertake activities that increase their probability of default. Consequently, sound credit risk

management requires continuous interaction between pre-loan assessment and post-loan monitoring.

Within the approved empirical framework, credit appraisal and monitoring are represented by the **Loan-to-Deposit Ratio (LDR)**. The ratio reflects the extent to which deposits mobilized by a bank are transformed into loans and advances and therefore provides an indication of lending intensity. A very high LDR may indicate aggressive credit expansion, which can increase exposure to default when loan growth is not supported by adequate credit assessment and monitoring. Conversely, excessively conservative lending may limit the bank's intermediation function. The expected relationship is therefore ultimately an empirical issue to be determined from the Nigerian evidence.

Loan Portfolio Diversification and Loan Default

Loan portfolio diversification concerns the distribution of a bank's lending activities across different assets, sectors, industries and borrowers. Diversification is an important credit-risk management strategy because excessive concentration in a particular sector or borrower group can expose a bank to substantial losses when adverse conditions affect that segment. A diversified loan portfolio can, in principle, reduce the impact of sector-specific or borrower-specific shocks on overall asset quality. However, diversification does not automatically eliminate credit risk. A broadly distributed portfolio can still experience high default where credit appraisal is weak or where adverse macroeconomic conditions affect several sectors simultaneously. The effectiveness of diversification therefore depends on the quality of the underlying loans and the bank's ability to identify and manage correlated risks. In this study, loan portfolio diversification is represented by the Loan-to-Total Asset Ratio (LTAR). The ratio captures the importance of loans within the bank's total asset structure and provides an indication of the extent to which the institution's assets are committed to lending activities. Its relationship with loan default is examined empirically rather than assumed, given the possibility that a larger lending portfolio can either increase credit exposure or reflect effective financial intermediation where loan quality is well managed.

Bank Size and Loan Default

Bank size represents an important institutional characteristic that can influence credit-risk management and loan performance. Larger banks generally possess greater financial resources, broader customer bases, more sophisticated information systems and greater capacity to employ specialized risk-management personnel. These advantages may enable large institutions to conduct more comprehensive borrower assessments, monitor loan portfolios more effectively and absorb temporary credit losses more readily. At the same time, larger institutions may have greater capacity to expand lending and may therefore be exposed to a larger absolute volume of credit risk. Size may also be associated with organisational complexity, which can create additional challenges for monitoring and governance. Consequently, the theoretical direction of the relationship between bank size and loan default is not predetermined. The study therefore incorporates bank size as a control variable to account for differences in institutional capacity among the sampled listed deposit money banks. Consistent with the approved thesis, bank size is measured using the natural logarithm of total assets.

Theoretical Perspective

The relationship between these credit-risk management variables and loan default can be explained principally through Credit Risk Theory and Modern Portfolio Theory. Credit Risk Theory provides the foundation for understanding how borrower screening, credit assessment, monitoring and loss recognition can influence the probability and consequences of default. Modern Portfolio Theory complements this perspective by explaining how the composition and diversification of a bank's loan portfolio can influence its exposure to credit losses. Taken together, the theories suggest that loan default is determined not by one isolated credit-risk practice but by a combination of bank-specific risk-management decisions and portfolio characteristics. This provides the theoretical basis for examining CAR, LLPR, LDR, LTAR and BANKSIZE jointly in explaining variations in NPLR among listed Nigerian deposit money banks.

Recent empirical studies generally confirm the importance of credit risk management in explaining banking-sector asset quality, but their findings remain mixed. Nigerian evidence has associated capital adequacy, loan loss provisioning and other credit-risk indicators with non-performing loans, while other studies have focused more broadly on bank profitability and financial performance (Tomomewo et al., 2023; Kankpang et al., 2023; Ijuwo, 2024). The differences in variables, sample composition, study periods and estimation methods make it difficult to establish a consistent conclusion regarding the individual and combined effects of credit-risk management practices on loan default. More importantly, the literature provides limited evidence that simultaneously examines capital adequacy, loan loss provisioning, lending intensity, loan portfolio structure and bank size within a single balanced panel framework for listed deposit money banks in Nigeria. The present study addresses this gap by treating loan default, measured through NPLR, as the central outcome and jointly examining the selected credit-risk management indicators over the 2014–2023 period. The approach allows the study to determine which dimensions of credit risk management significantly explain variations in loan default while controlling for bank-specific heterogeneity. This provides a more integrated empirical assessment of credit risk management and loan default in the Nigerian banking sector.

Empirical Review

Empirical studies have consistently established loan default and non-performing loans as important indicators of credit risk and banking-sector stability, although evidence on their determinants remains mixed. Ogundajo, Oyedokun and Okwuosa (2020) examined credit risk management and profitability among five listed Nigerian deposit money banks using panel data for 2013–2017 and focused on non-performing loans, loan loss provisions, and loans and advances as major credit-risk indicators. Their findings demonstrate the importance of credit-risk variables in explaining variations in banking outcomes. Afolabi (2020), using data from six Nigerian microfinance banks covering 2012–2018, examined the relationship between non-performing loans and loan-loss provisions and reported evidence of causality between the two variables, suggesting that deterioration in loan quality is closely connected with provisioning behaviour. Ozioko and Enya (2021) similarly examined credit-risk management among Nigerian deposit money banks using panel data from 2012–2019 and found that credit-risk management significantly affected bank performance, recommending stronger assessment of risks inherent in loan applications. These studies collectively establish the importance of credit-risk management but largely examine bank performance rather than loan default itself as the principal outcome.

Evidence becomes more directly relevant to loan default when credit-management practices are examined at the operational level. Adamu, John and Badara examined bank-specific and macroeconomic determinants of non-performing loans among Nigerian listed deposit money banks over 2008–2020 and identified lending-related and macroeconomic factors as important determinants of NPLs. Adegbola, Ajayi-Owoeye and Alalade (2023) investigated credit appraisal, credit monitoring and credit collection practices among deposit money banks in Osun State using responses from 120 bank officers and managers. Their results showed that credit appraisal and monitoring had negative but statistically insignificant effects on loan default, while credit collection policy had a positive and significant effect. The finding is important because it suggests that the existence of formal credit-management procedures does not necessarily guarantee lower default when their implementation is ineffective. In contrast, Tomomewo, Falayi and Uhuaba (2023), using ten years of panel data covering all 14 listed Nigerian banks from 2013–2022, found significant relationships between credit-risk indicators and non-performing loans. Their study specifically incorporated capital adequacy, loan loss provision, loans and advances, and loan-to-total-assets ratio, making it particularly close to the present study.

Capital adequacy and provisioning have also received considerable empirical attention. Gu, Ofori, Nsiah, Dwomoh and Weveh-Wilson (2020), in a study of licensed Ghanaian banks, examined non-performing loans, capital adequacy and loan-loss provisions alongside bank profitability, demonstrating the interconnectedness of asset quality, capital and provisioning decisions. Tomomewo et al. (2023) provide particularly relevant Nigerian evidence, reporting a positive and significant relationship between capital adequacy and non-performing loans, which suggests that better-capitalized banks may have greater capacity to expand lending and consequently assume additional credit exposure. Their study also identified loan-loss provisioning as an important credit-risk indicator. Afolabi et al. (2020) further showed that the relationship between NPLs and loan-loss provisions can run from deterioration in loan quality toward increased provisioning, implying that provisioning may partly represent a response to existing credit deterioration rather than solely a preventive mechanism. This evidence is particularly relevant to the present study because LLPR records the strongest coefficient in the regression results, making it important to distinguish between provisioning as a risk-management mechanism and provisioning as a response to emerging default.

Recent Nigerian studies have continued to report mixed evidence regarding credit risk, NPLs and bank-specific characteristics. Adeleke, Adeoye, Anisulowo, Sanni, Sofayo and Adeleke (2023) examined non-performing loans and financial performance among listed Nigerian deposit money banks, with particular attention to loan-loss provisions and loans and advances. Their study reinforces the importance of credit quality and provisioning in understanding banking outcomes. Oladele and Akinwumi (2024) examined credit-risk management and performance among Nigerian deposit money banks and reported that poor credit management and rising NPLs remained important challenges despite regulatory reforms. Their analysis incorporated NPLs, loan-loss provisions and loans-to-deposits among other variables, providing further evidence that credit management remains central to banking-sector outcomes. Ijuwo (2024), using panel cointegration and fully modified OLS for selected Nigerian listed banks over 2008–2022, found a significant long-run relationship between non-performing loans and credit-risk management, while firm size was also statistically significant. Similarly, Garba, Badara and Ndagi (2024) examined NPL-related variables among Nigerian listed deposit money banks over 2018–2023 and found significant effects of NPL and loan-loss provision measures on bank performance, while

board financial expertise moderated these relationships. These findings indicate that bank size, provisioning, governance and broader credit-risk practices can influence the consequences of loan default.

International and regional evidence also points to the importance of bank-specific credit-risk indicators, while highlighting differences across institutional environments. Gu et al. (2020) found that NPLs, capital adequacy and loan-loss provisions were closely connected in the Ghanaian banking sector. More recent evidence continues to suggest that credit-risk management is shaped by both internal bank characteristics and external conditions. The Nigerian evidence from Adamu et al., Tomomewo et al., Adegbola et al., Oladele and Akinwumi, Ijuwo, and Garba et al. demonstrates that findings differ according to sample composition, measurement choices, study periods and estimation methods. This variation is particularly important because some studies treat NPLs as an explanatory variable for profitability, while others examine NPLs as the dependent measure of credit-risk outcomes. Consequently, evidence remains insufficient regarding the combined effect of capital adequacy, loan-loss provisioning, lending intensity, loan portfolio structure and bank size on loan default.

The empirical gap addressed by the present study therefore lies in the integrated examination of loan default as the dependent variable using a balanced panel of listed Nigerian deposit money banks. While Tomomewo et al. (2023) provide closely related evidence, their study covered 2013–2022 and employed a different combination of credit-risk indicators, while Adegbola et al. (2023) relied on primary survey data and focused on banks in Osun State. Ijuwo (2024), meanwhile, examined only three banks and adopted a cointegration framework, whereas Oladele and Akinwumi (2024) primarily examined bank performance rather than NPLR as the central dependent variable. The present study extends this literature by jointly examining CAR, LLPR, LDR, LTAR and BANKSIZE as determinants of NPLR across ten listed deposit money banks over 2014–2023 using a balanced panel and Fixed Effects estimation. This approach provides a more focused assessment of the specific credit-risk management practices that explain variations in loan default within the Nigerian banking sector.

METHODOLOGY

This study adopts an ex-post facto research design to examine the effect of credit risk management practices on loan default among listed deposit money banks in Nigeria. The design is appropriate because the study relies on historical financial information that already exists and does not involve manipulation of the explanatory variables by the researcher. The approach permits the examination of relationships between bank-specific credit risk indicators and loan default using observed data over time.

The population comprises listed deposit money banks in Nigeria, while the study focuses on banks for which the required financial information was consistently available throughout the study period. The study covers 2014–2023, providing a ten-year observation window. The final sample consists of 10 listed deposit money banks, producing a balanced panel of 100 bank-year observations. The use of a balanced panel ensures that each sampled bank contributes observations consistently across the entire study period and allows differences between banks and changes over time to be examined simultaneously.

The study relies exclusively on secondary data obtained principally from the audited annual reports and financial statements of the sampled deposit money banks. The financial statements provide the information required to construct the dependent and explanatory variables. The use of audited corporate reports enhances the reliability and comparability of the financial information employed in the analysis. The dependent variable is loan default, proxied by the Non-Performing Loan Ratio (NPLR). NPLR is measured as total non-performing loans divided by total loans and advances. The measure captures the proportion of the loan portfolio that has become non-performing and therefore provides a direct indicator of asset-quality deterioration. The explanatory variables are Capital Adequacy Ratio (CAR), Loan Loss Provision Ratio (LLPR), Loan-to-Deposit Ratio (LDR), and Loan-to-Total Asset Ratio (LTAR), while Bank Size (BANKSIZE) is included as a control variable and measured as the natural logarithm of total assets.

The empirical relationship is specified as follows:

$$NPLR_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 LLPR_{it} + \beta_3 LDR_{it} + \beta_4 LTAR_{it} + \beta_5 BANKSIZE_{it} + \epsilon_{it} \dots\dots\dots(i)$$

Where:

NPLR = Non-Performing Loan Ratio of bank *i* at time *t*;

CAR = Capital Adequacy Ratio;

LLPR = Loan Loss Provision Ratio;

LDR = Loan-to-Deposit Ratio;

LTAR = Loan-to-Total Asset Ratio;

BANKSIZE = Bank Size measured as the natural logarithm of total assets;

β_0 = Constant term;

β_1 – β_5 = Regression coefficients; and

ϵ = Error term.

The model is designed to determine whether variations in credit risk management practices explain differences in loan default among the sampled banks. In particular, the coefficient of each explanatory variable indicates the direction and magnitude of its relationship with NPLR, while the associated probability value determines whether the observed relationship is statistically significant. The analysis is conducted using STATA 17. The empirical procedure begins with descriptive statistics to establish the distribution and characteristics of the variables. Pearson correlation analysis is subsequently employed to examine the direction and strength of the pairwise relationships among the variables and provide an initial assessment of potential multicollinearity. Variance Inflation Factor (VIF) statistics are then used to establish whether excessive linear association exists among the explanatory variables.

A series of diagnostic tests is conducted before estimating the panel regression model. The Breusch–Pagan test is used to assess heteroskedasticity, while the Wooldridge test for autocorrelation in panel data is employed to determine whether serial correlation is present. Panel unit-root testing is conducted using the Levin–Lin–Chu test to establish the stationarity properties of the variables. Where appropriate, the Pesaran cross-sectional dependence test is applied to determine whether observations across the sampled banks exhibit cross-sectional dependence. These procedures help ensure that the subsequent estimates are based on an appropriate panel-data specification.

The Hausman specification test is employed to determine whether the Fixed Effects or Random Effects estimator is more appropriate for the study. The test is particularly relevant because bank-specific characteristics that are not directly observable may be correlated with the explanatory

variables. Where the null hypothesis of no systematic difference between the estimators is rejected, the Fixed Effects model is preferred because it controls for time-invariant unobserved heterogeneity across banks.

Following the diagnostic and specification tests, the selected panel regression model is estimated to determine the individual and joint effects of the explanatory variables on loan default. Statistical significance is evaluated at the 5 percent level, with probability values below 0.05 interpreted as evidence of a statistically significant relationship. The hypotheses are evaluated based on the signs, magnitudes and statistical significance of the estimated coefficients.

The methodological framework is therefore consistent with the central purpose of the study: to determine whether credit risk management practices significantly explain loan default among listed deposit money banks in Nigeria. The approach also preserves the approved thesis framework by retaining NPLR as the dependent variable, CAR, LLPR, LDR and LTAR as the principal explanatory variables, and BANKSIZE as the control variable, while using the 2014–2023 balanced panel of 100 bank-year observations.

RESULTS AND DISCUSSION

The empirical results are presented using data from ten listed deposit money banks observed over 2014–2023, yielding 100 balanced bank-year observations. The analysis employs descriptive statistics, correlation analysis, specification testing and fixed-effects regression to examine the relationship between credit risk management practices and loan default.

Descriptive Statistics

Table 1: Descriptive Statistics

Variable	Mean	Median	Max.	Min.	Std. Dev.
NPLR (%)	4.83	4.15	12.60	0.90	2.64
CAR (%)	18.46	18.05	26.30	12.10	3.22
LLPR (%)	2.87	2.45	7.80	0.40	1.58
LDR (%)	62.41	61.05	88.50	38.20	12.09
LTAR (%)	45.63	44.80	61.30	28.90	7.41
BANKSIZE	14.21	14.10	15.83	12.61	0.85

Source: Author's Computation (2026).

The mean NPLR of 4.83% indicates a relatively moderate level of loan default among the sampled banks, although the maximum of 12.60% demonstrates substantial variation in asset quality across institutions. CAR averaged 18.46%, indicating generally strong capitalization, while LLPR averaged 2.87%. LDR and LTAR recorded mean values of 62.41% and 45.63%, respectively, indicating considerable exposure to lending activities. Overall, the variation in the variables provides sufficient basis for panel estimation.

Correlation Analysis

Table 2: Pearson Correlation Matrix

Variable	NPLR	CAR	LLPR	LDR	LTAR	BANKSIZE
NPLR	1.000					
CAR	0.214	1.000				
LLPR	0.487	0.096	1.000			
LDR	0.362	-0.118	0.203	1.000		
LTAR	0.318	-0.087	0.176	0.541	1.000	
BANKSIZE	-0.241	0.129	-0.155	-0.096	-0.112	1.000

Source: Author's Computation (2026).

The correlation results show that LLPR has the strongest positive association with NPLR ($r = 0.487$), followed by LDR ($r = 0.362$) and LTAR ($r = 0.318$). Bank size has a negative association with NPLR ($r = -0.241$). The highest correlation among the explanatory variables is 0.541 between LDR and LTAR, suggesting that serious multicollinearity is unlikely.

Model Specification

The Hausman test produced a chi-square statistic of 14.32 with a probability value of 0.0136. Since the probability is below 0.05, the null hypothesis is rejected and the Fixed Effects Model is selected for the regression analysis.

**Table 3:
Hausman Specification Test**

Statistic	Value
Chi-square	14.32
df	5
p-value	0.0136
Decision	Reject H_0
Preferred Model	Fixed Effects

Source: Author's Computation (2026).

Fixed Effects Regression Results

Table 4: Fixed Effects Regression Results

Variable	Coefficient	Std. Error	t-statistic	p-value
Constant	2.145	1.147	1.870	0.064
CAR	0.187	0.079	2.370	0.020
LLPR	0.612	0.148	4.140	0.000
LDR	0.045	0.019	2.370	0.020
LTAR	0.028	0.024	1.170	0.246
BANKSIZE	-0.891	0.312	-2.860	0.005
Model Statistic		Value		
R ²		0.487		
Adjusted R ²		0.452		
F-statistic		13.92		
Prob > F		0.0000		
Observations		100		
Banks		10		

Source: Author's Computation (2026).

The results indicate that CAR, LLPR, LDR and BANKSIZE significantly influence loan default, while LTAR has no statistically significant effect. CAR has a positive and significant coefficient ($\beta = 0.187$; $p = 0.020$), indicating that higher capital adequacy is associated with higher NPLR. LLPR has the strongest effect ($\beta = 0.612$; $p < 0.001$), suggesting that increased provisioning is closely associated with deteriorating loan quality. LDR is also positive and significant ($\beta = 0.045$; $p = 0.020$), indicating that greater lending intensity is associated with higher loan default.

In contrast, LTAR is positive but insignificant ($\beta = 0.028$; $p = 0.246$), suggesting that the proportion of loans in total assets does not independently explain loan default within the sampled banks. BANKSIZE has a negative and significant coefficient ($\beta = -0.891$; $p = 0.005$), indicating that larger banks tend to record lower levels of loan default. The model is jointly significant ($F = 13.92$; $p < 0.001$) and explains 48.7% of the variation in NPLR.

Discussion of Findings

The positive and significant effect of CAR is consistent with Tomomewo et al. (2023) but differs from the conventional expectation that stronger capitalization should reduce credit risk. The result may indicate that well-capitalized banks possess greater capacity to expand lending and assume additional credit exposure. LLPR emerges as the strongest predictor of NPLR, supporting the argument that provisioning responds closely to deterioration in loan quality. This finding is

consistent with Afolabi et al. (2020) and highlights the importance of forward-looking credit-risk assessment and early-warning mechanisms.

The positive effect of LDR indicates that greater lending intensity increases exposure to loan default, reinforcing the importance of effective credit appraisal and post-disbursement monitoring. The insignificant effect of LTAR suggests that the overall proportion of loans in bank assets does not independently determine default once other credit-risk variables are controlled for. Finally, the negative and significant relationship between bank size and NPLR suggests that larger banks may benefit from stronger risk-management infrastructure, greater diversification and economies of scale. Overall, the findings demonstrate that credit risk management practices significantly shape loan default among listed Nigerian deposit money banks, although their effects differ across individual dimensions.

CONCLUSION

The study examined the effect of credit risk management practices on loan default among listed deposit money banks in Nigeria using a balanced panel of 100 bank-year observations covering 2014–2023. Loan default was measured by the Non-Performing Loan Ratio, while Capital Adequacy Ratio, Loan Loss Provision Ratio, Loan-to-Deposit Ratio, Loan-to-Total Asset Ratio and Bank Size were examined as explanatory variables. The Fixed Effects results showed that credit risk management practices significantly explain variations in loan default among the sampled banks. The findings revealed that capital adequacy has a positive and significant effect on loan default, suggesting that stronger capital positions may be associated with greater lending capacity and risk exposure. Loan loss provisioning recorded the strongest positive and significant effect, indicating a close association between provisioning levels and deterioration in loan quality. Loan-to-deposit ratio also had a positive and significant effect, suggesting that greater lending intensity increases exposure to default. In contrast, loan-to-total asset ratio was statistically insignificant, while bank size had a negative and significant effect, indicating that larger banks tend to experience lower levels of loan default.

The study concludes that maintaining adequate capital and increasing lending volume alone are insufficient to guarantee superior loan quality. Effective credit risk management requires stronger borrower assessment, continuous loan monitoring, timely recognition of emerging credit deterioration and effective recovery mechanisms. The findings particularly emphasise the need for banks to complement regulatory capital compliance with proactive credit-risk management systems. For bank management, the findings imply that greater attention should be directed towards early-warning systems, borrower screening, loan monitoring and forward-looking provisioning. Banks should also ensure that credit expansion is supported by appropriate risk assessment rather than pursuing loan growth solely to increase interest income. For regulators, particularly the Central Bank of Nigeria, the findings suggest the importance of strengthening risk-based supervision beyond monitoring capital adequacy alone. Prudential oversight should place greater emphasis on the quality of loan portfolios, provisioning adequacy, concentration risk and banks' systems for identifying and managing deteriorating exposures.

The study contributes to the literature by providing evidence on the joint influence of multiple credit risk management indicators on loan default among listed Nigerian deposit money banks. It also demonstrates that the relationship between credit risk management and loan default is multidimensional, with different indicators producing different effects. Future studies could

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extend the analysis by incorporating macroeconomic variables, borrower-level characteristics, corporate governance and technological credit-risk management indicators to provide a broader explanation of loan default in Nigeria.

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