

Beyond Loan Appraisal: The Role of Credit Monitoring and Recovery Practices in Reducing Non-Performing Loans in an Emerging Economy

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ABSTRACT: *This study examines how various dimensions of credit management, specifically customer loan appraisal, credit control and monitoring, and credit collection policies, influence non-performing loans within the Nigerian banking sector. To achieve this, the research adopts a cross-sectional survey design, utilizing exploratory factor analysis to identify underlying dimensions of credit management, while simultaneously employing regression analysis to assess their impact on loan quality. The findings reveal that customer loan appraisal does not significantly reduce non-performing loans, suggesting that pre-lending assessment alone is insufficient. Conversely, credit control and monitoring, alongside credit collection policies, are shown to significantly reduce non-performing loans. Furthermore, the analysis indicates that borrower support, advisory services, collateral assessment, and robust follow-up and recovery efforts are critical to mitigating loan deterioration; in contrast, compromises in credit administration contribute to an increase in non-performing loans.*

Keywords: credit risk management, credit collection; credit monitoring, loan appraisal, loan recovery, non-performing loans

INTRODUCTION

Non-performing loans remain one of the most persistent threats to banking stability and financial system sustainability, particularly in emerging and developing economies (Amin et al., 2019; Naili and Lahrichi, 2022). NPLs represent loans for which borrowers have failed to meet contractual repayment obligations, thereby exposing financial institutions to heightened credit risk, reduced profitability, liquidity constraints, and potential financial distress (Elshani, 2025; Ma'aji et al., 2023). The accumulation of NPLs limits banks' capacity to perform their fundamental intermediation role of mobilizing deposits and extending credit to productive

sectors of the economy (Bank, 2002). Consequently, effective management of NPLs has become a major concern for regulators, policymakers, and bank managers worldwide.

The challenge of NPLs is particularly pronounced in developing countries where weak institutional structures, economic volatility, and deficiencies in credit risk management systems increase the likelihood of loan defaults (Muniru et al., 2025). Evidence from emerging markets indicates that NPL ratios are considerably higher than those observed in developed economies, with many African banking systems recording NPL levels above internationally acceptable thresholds (Goyal et al., 2023). For instance, data from the World Bank cited by (Ozili, 2019) indicates that the average NPL ratio for emerging markets and developing economies stood at approximately 6.7% and 2.1%, respectively. Even within emerging economies, the prevalence of NPLs varies significantly across regions. While many African banking systems report NPL ratios exceeding 10%, counterparts in Asia and Latin America often maintain ratios below the emerging market benchmark of 6.7% (Ozili & Arun, 2023). Consequently, addressing these localized NPL challenges has become a critical research priority for the African banking sector. In Nigeria, despite continuous regulatory reforms by the Central Bank of Nigeria aimed at strengthening banking supervision and improving asset quality, the banking sector continues to experience significant volumes of non-performing loans (Osondu-Ekekwe et al., 2026). The persistence of NPLs has important implications not only for individual banks' financial performance but also for broader economic growth and financial inclusion.

While standard loan appraisal processes provide an initial safeguard against loan default, empirical evidence suggests that robust credit monitoring and proactive loan recovery frameworks are essential to mitigating the influence of asymmetric information and loan default risk (Karlan & Zinman, 2009). Specifically, credit monitoring serves as a post-disbursement mechanism that enables banks to detect early warning signs of borrower distress before they escalate into full-scale default (Ozili, 2018). Consequently, when a loan is actively monitored, lenders are better positioned to employ timely interventions such as debt restructuring or the enforcement of collateral clauses that prevent significant impairment of the loan portfolio (Salas et al., 2024). In addition to credit monitoring, rigorous recovery frameworks facilitate the systematic liquidation of non-performing assets, thereby minimizing the duration of capital stagnation. Complementing these efforts, active recovery practices, often referred to as loan collection policies, encompass strategies that banks employ to recoup overdue funds through mechanisms such as flexible tenure adjustments, credit term restructuring, and asset conversion. Ultimately, implementing these recovery strategies effectively contributes to improved loan quality.

Prior studies have extensively examined the determinants and consequences of NPLs, focusing on both macroeconomic (Michail, 2025; Saliba et al., 2023; Waqas et al., 2017) and bank-specific perspectives (Salas et al., 2024). Existing evidence identifies factors such as inflation, economic recession, unemployment, interest rate fluctuations, and institutional environments as major drivers of deteriorating loan quality (Goyal et al., 2023; Škarica, 2014). Similarly, a large body of literature has investigated the consequences of NPLs on bank profitability (Ozili, 2019), capital adequacy, and financial stability (Kashif et al., 2016). However, while these studies provide valuable insights into the external determinants and effects of NPLs, relatively

less attention has been devoted to the internal credit management practices through which banks can prevent the emergence and accumulation of problem loans.

From a credit risk management perspective, effective loan administration begins before credit is granted and continues throughout the entire credit lifecycle. The principles of information asymmetry theory suggest that lenders often possess imperfect information regarding borrowers' true financial conditions and repayment intentions, creating problems of adverse selection and moral hazard (Ahmed et al., 2022; Smith, 1987). Consequently, effective customer loan appraisal, credit control and monitoring, and efficient credit collection policies become essential mechanisms through which banks can mitigate credit risk and minimize the incidence of NPLs (Tien and Nguyen, 2023). Although previous studies have examined aspects of credit risk management, existing findings remain inconclusive and are predominantly concentrated in developed banking systems or selected emerging economies, thereby limiting their applicability to the Nigerian banking environment, which is characterized by unique institutional and operational challenges.

The limited empirical evidence on the specific mechanisms through which different dimensions of credit management concurrently influence NPLs represents a significant gap in the literature. In particular, little attention has been given to disentangling credit management into its underlying dimensions, namely, customer loan appraisal, credit control and monitoring, and credit collection policies, and examining their relative effectiveness in reducing non-performing loans among banks in Nigeria. Addressing this gap is important because understanding the specific credit management practices that most effectively reduce NPLs can assist bank managers and regulators in developing targeted risk management strategies (Manyama et al., 2026).

Against this background, this study investigates the effect of credit management practices on non-performing loans among deposit money banks in Nigeria. Specifically, the study examines the extent to which customer loan appraisal, credit control and monitoring, and credit collection policies influence the incidence of NPLs. The study contributes to the banking and credit risk literature in three important ways. First, it shifts the discussion from the consequences of NPLs to their preventable internal drivers by focusing on credit management mechanisms. Second, it provides evidence from Nigeria, an important emerging economy where challenges associated with loan quality continue to affect banking sector performance. Third, rather than treating credit management as a single construct, the study decomposes it into multiple dimensions and evaluates their individual contributions to reducing non-performing loans.

The study employs a survey approach involving credit management personnel of deposit money banks in Nigeria. Principal Component Factor Analysis is used to identify the underlying dimensions of credit management practices, while Structural Equation Modeling and complementary regression analysis are employed to examine the relationships between credit management dimensions and non-performing loans. This approach enables a more comprehensive understanding of the multidimensional nature of credit management and its influence on loan quality (Otok et al., 2025).

The remainder of this paper is organized as follows. Section 2 reviews the relevant theoretical and empirical literature and develops the study hypotheses. Section 3 presents the research methodology, including data collection procedures, variable measurement, and model specification. Section 4 reports the empirical results and discusses the findings. Finally, Section 5 concludes the study, highlights policy implications, and provides suggestions for future research.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Theoretical Foundation

Theories explaining how customer loan appraisal, credit control and monitoring, and credit collection policies reduce non-performing loans predominantly include the information asymmetry theory and the agency theory, which articulate how rigorous oversight of borrower behavior and collateral management can align the interests of lenders and borrowers to minimize default incidents (OWONYE & OBONOFIEMRO, 2022). Furthermore, the resource-based view of the firm suggests that banks possessing superior internal credit management capabilities achieve a sustained competitive advantage by reducing insolvency risks and enhancing overall loan portfolio quality (Hasan et al., 2024).

Specifically, the information asymmetry theory provides a framework for understanding how asymmetric information between lenders and borrowers leads to adverse selection and moral hazard (Yan et al., 2015). Because borrowers often possess superior information regarding their financial condition, repayment capacity, and risk profile, banks must implement rigorous credit monitoring and screening processes to accurately evaluate the true creditworthiness of applicants (Sanyaolu et al., 2020). By mitigating these informational gaps, banks can ensure more consistent lending decisions and reduce the prevalence of flawed risk assessments that often arise from inadequate staff competencies (Tucho, 2025a, 2025b).

Complementing this perspective, agency theory highlights the necessity of robust internal governance and continuous loan monitoring to align the interests of bank management with those of shareholders by mitigating opportunistic borrower behavior (Oyasor, 2025; Semusu et al., 2026). Such mechanisms are critical, as effective monitoring and management practices enable banks to detect early warning signs of distress and reduce the overall volume of problematic assets (Safitri et al., 2023). Furthermore, these theoretical frameworks underscore the "bad management" hypothesis, which posits that deficiencies in screening and monitoring quality directly escalate loan losses (Alandejani and Asutay, 2017; Cucinelli et al., 2018).

In addition to these governance-focused theories, the resource-based view posits that these internal practices represent intangible organizational assets that, when optimized through disciplined credit control and appraisal systems, facilitate the superior management of loan portfolios and sustainable profitability (Shkodra et al., 2024). Indeed, the effective management of these internal resources, ranging from specialized credit staff to robust internal control frameworks, serves as a mechanism to minimize agency costs and maximize firm value (Jain et al., 2023), (Haron et al., 2020). Consequently, banks that fail to invest adequately in these specialized human and procedural resources are prone to higher levels of non-performing loans,

as they lack the capacity to mitigate the "bad management" failures that characterize poor asset quality (Badunenko et al., 2021). Furthermore, elevated non-performing loans stemming from these internal deficiencies may eventually threaten financial stability by reducing bank capital and precipitating broader liquidity crises (Hossain and Golder, 2022; Kingu et al., 2018). Consistent with this, the skimping hypothesis suggests that strategic underinvestment in these monitoring and appraisal resources often manifests as temporary operational cost efficiency at the expense of long-term asset quality (Wengerek et al., 2022).

Beyond these internal governance frameworks, Modern Portfolio Theory further explains the need for risk management in banking. It posits that banks can minimize idiosyncratic credit risk through the strategic diversification of their loan portfolios, thereby reducing exposure to the default probability of any single borrower or sector (Ewool and Quartey, 2021). By emphasizing the importance of holistic credit risk analysis encompassing security arrangements and rigorous monitoring, this framework ensures that financial institutions effectively mitigate systemic exposure and bolster overall financial performance. Building upon these theoretical underpinnings, empirical evidence consistently demonstrates that rigorous credit appraisal measurements, including meticulous risk evaluation and accurate loan pricing, are fundamental to cultivating high-quality loan portfolios (Bhatt et al., 2024). Such empirical findings corroborate that deficiencies in borrower screening and ongoing oversight do not merely represent administrative oversights but constitute significant operational failures that jeopardize long-term solvency (Chantha et al., 2024; Githaiga, 2020). Specifically, these lapses often manifest in a higher ratio of non-performing loans to total assets, a critical indicator that historically correlates with diminished profitability and organizational inefficiency (Naser, 2019; Rabson & Norman, 2016).

Finally, credit collection policies serve as a critical final defense in mitigating loss, particularly when they incorporate structured engagement strategies that minimize the incidence of long-term non-performing assets (Chongo & Chibomba, 2026). These procedural safeguards enable institutions to align their internal credit risk exposure with regulatory requirements, ensuring sufficient capital exists to absorb unforeseen losses (Malakotipour, 2024; Tien & Nguyen, 2023).

Credit Management and Non-Performing Loans

Credit management encompasses the set of policies and procedures financial institutions employ to assess borrower creditworthiness, monitor loan performance, enforce repayment obligations, and minimize credit losses (Nikolaidou and Vogiazas, 2014). Within the banking industry, effective credit management is paramount, as the quality of lending decisions directly dictates the volume of non-performing loans and the overall financial stability of these institutions. Empirical evidence consistently suggests that banks prioritizing rigorous screening and ongoing appraisal systems curb the escalation of problematic assets; conversely, strategic deficiencies in these areas often correlate with higher default rates (Githaiga, 2020; Namoonde,

2026). Consequently, the ratio of non-performing loans to total loans frequently measures the fragility of financial institutions (Cicchello et al., 2022; Vaghela and Singh, 2026).

Non-performing loans refer to credit facilities where principal or interest repayments remain overdue for a specified period, typically 90 days or more in accordance with regulatory guidelines (Škarica, 2014). Rising NPLs not only reduce banks' earnings and weaken capital positions but also constrain their capacity to extend credit to productive sectors of the economy (Thornton & Tommaso, 2020). While macroeconomic conditions such as inflation, economic downturns, and interest rate volatility inevitably influence NPL levels, internal credit management practices remain a crucial, controllable mechanism through which banks can actively prevent loan deterioration (Škarica, 2014).

Existing empirical evidence suggests that weak borrower assessment, inadequate monitoring, ineffective collection procedures, and poor enforcement of credit policies collectively contribute to higher NPL levels (Cincinelli & Piatti, 2021). However, there is a paucity of research specific to the Nigerian context, where institutional weaknesses and information asymmetry are more pronounced; consequently, it remains unclear which specific dimensions of credit management exert the greatest influence on loan quality in this market. Furthermore, recurring instances of banking distress in Nigeria have been directly linked to the widespread failure of these credit management practices, often exacerbated by insider abuse and a systemic disregard for prudent lending principles (Aroghene & Ikeora, 2022). Such systemic failures, frequently characterized by the proliferation of unsecured lending and a lack of rigorous collateral valuation, ultimately erode the asset quality necessary for maintaining long-term institutional stability (Kindness & Donald, 2021).

Customer Loan Appraisal and Non-Performing Loans

Customer loan appraisal involves the systematic evaluation of a borrower's creditworthiness before loan approval, typically including assessment of the borrower's character, repayment capacity, financial strength, collateral availability, and prevailing business conditions (Agaba et al., 2023; Agarwal & Ben-David, 2018; Catherine, 2019; ZAKOYAN, 2023). From the perspective of information asymmetry theory, effective loan appraisal reduces adverse selection by enabling banks to identify risky borrowers before credit is granted, ensuring lending decisions are based on reliable information, thereby reducing the probability of loan default (Asongu et al., 2017; Atieno et al., 2022; Bermpei et al., 2018; Crawford et al., 2018; Stroebel, 2015; ZAKOYAN, 2023). Empirical evidence generally supports the argument that strong loan appraisal mechanisms improve loan performance and reduce NPLs (Atieno et al., 2022). Studies have shown that rigorous borrower screening, financial analysis, and collateral assessment are associated with lower default rates because banks are better able to select creditworthy borrowers (Agarwal & Ben-David, 2018; Catherine, 2019). Nevertheless, some studies report insignificant effects of loan appraisal due to institutional weaknesses, inadequate borrower information, and poor enforcement of appraisal outcomes, particularly in developing economies (Goyal et al., 2023; Kowsar & Kowsar, 2022). Based on these arguments, the study hypothesizes that:

H1: Customer loan appraisal significantly reduces non-performing loans of deposit money banks in Nigeria.

Credit Control and Monitoring and Non-Performing Loans

Credit control and monitoring involve continuous assessment of borrowers after loan disbursement to ensure compliance with agreed loan conditions and to identify early warning signals of financial distress (Khairani & Diyanty, 2022; Ndebugri & Senzu, 2017; Panaya et al., 2022; Umeorah et al., 2024). Information asymmetry does not end after credit approval because borrowers may alter their behavior once funds have been obtained. Continuous monitoring therefore reduces moral hazard by allowing banks to detect repayment problems early and implement corrective actions (Jang & Kang, 2024; Penalver, 2016). Such actions include periodic review of financial statements, monitoring cash flows, maintaining close communication with borrowers, and providing advisory support where necessary (Umeorah et al., 2024).

Prior empirical studies largely demonstrate that effective credit monitoring contributes significantly to improved loan performance and lower NPL levels (Cincinelli & Piatti, 2021; Piatti & Cincinelli, 2018; Purnama et al., 2020). However, ineffective monitoring, weak internal controls, and compromised credit administration have been identified as major factors contributing to loan deterioration in many developing banking systems (Khan et al., 2020; Kowsar & Kowsar, 2022; Semusu et al., 2026). Therefore, the study hypothesizes that:

H2: Credit control and monitoring significantly reduce non-performing loans of deposit money banks in Nigeria.

2.5 Credit Collection Policy and Non-Performing Loans

Credit collection policy represents the strategies and procedures adopted by banks to ensure timely repayment of overdue loans and recover delinquent credit facilities. Effective collection policies include regular follow-up, borrower engagement, restructuring where necessary, and legal recovery actions. From a risk management perspective, an efficient collection system minimizes credit losses and discourages strategic default by borrowers (Duman et al., 2017). Strong collection mechanisms also reinforce borrower discipline and improve repayment behavior (Amoah & Boakye, 2025).

Empirical studies indicate that proactive follow-up and recovery strategies contribute to lower levels of NPLs by improving repayment compliance and reducing the duration of overdue loans (Amoah & Boakye, 2025). Nonetheless, weak legal systems and inefficient recovery mechanisms in developing economies may limit the effectiveness of collection efforts (Cerulli et al., 2020). Consequently, the study proposes that:

H3: Credit collection policy significantly reduces non-performing loans of deposit money banks in Nigeria.

METHODOLOGY

Research Design and Sample

This study adopts a quantitative cross-sectional survey research design to investigate the relationship between credit management practices and non-performing loans among deposit money banks in Nigeria. The survey approach is appropriate because it allows the collection of perceptual information from banking personnel who are directly involved in credit appraisal, loan monitoring, and recovery processes. Given that credit management practices involve internal procedures and operational decisions that may not be fully observable through publicly available financial data, primary survey evidence provides valuable insights into the mechanisms through which banks manage credit risk.

The target population comprises credit-related personnel from deposit money banks operating in Nigeria, including staff involved in loan appraisal, credit administration, credit monitoring, and recovery activities. A structured questionnaire was administered to respondents across selected banks. The study obtained 667 valid responses after data screening, representing a high response rate compared with typical survey-based banking studies.

The respondents possess adequate professional and educational backgrounds to provide reliable information regarding credit management practices. The demographic profile indicates a balanced representation of male and female respondents, with most respondents possessing tertiary education and substantial banking experience, thereby improving the credibility of the survey responses.

Measurement of Variables

The study conceptualizes credit management as a multidimensional construct comprising customer loan appraisal, credit control and monitoring, and credit collection policy. These dimensions are measured using multiple questionnaire items developed from established credit risk management literature and banking practices.

Customer loan appraisal captures procedures undertaken before loan approval, including borrower profiling, evaluation of business conditions, compliance with lending policies, and collateral assessment. Credit control and monitoring measures post-disbursement activities, including adherence to credit terms, assessment of borrowers' financial conditions, continuous engagement with borrowers, and avoidance of compromised credit decisions. Credit collection policy captures strategies aimed at improving repayment compliance, including follow-up mechanisms and loan recovery procedures.

The dependent variable, non-performing loans, is measured using respondents' assessment of loan deterioration, including loan-loss provisioning and loan breaches or restructuring, based on prudential credit classifications. All measurement items were assessed using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Preliminary Data Analysis and Construct Validation

Prior to hypothesis testing, the data were subjected to preliminary diagnostic procedures, including examination of missing values, descriptive statistics, and multicollinearity assessment. To examine the underlying structure of the measurement instruments, Exploratory Factor Analysis (EFA) using principal component extraction with orthogonal rotation was

employed. The purpose of the EFA was to identify the latent dimensions underlying credit management and non-performing loan constructs and to reduce the observed variables into interpretable factors.

Following established recommendations, items with factor loadings below acceptable thresholds were excluded to improve construct clarity. The extracted factors demonstrated meaningful conceptual interpretation, resulting in three dimensions of customer loan appraisal (borrower profiling, business condition and loan policy, and collateral), three dimensions of credit control and monitoring (credit terms and repayment capacity, support and advisory services, and compromise), two dimensions of credit collection policy (follow-up efforts and loan recovery efforts), and two dimensions of non-performing loans (loan loss provision and loan breach/rescheduling).

To further strengthen methodological rigor, future versions of the analysis should report the Kaiser–Meyer–Olkin (KMO) statistic, Bartlett’s test of sphericity, Cronbach’s alpha, and composite reliability values for each construct to establish sampling adequacy, internal consistency, and measurement reliability.

Model Specification

Given the exploratory nature of the factor extraction procedure, the study employs regression-based analyses using the extracted factor scores to examine the relationship between credit management dimensions and non-performing loans.

The baseline empirical model is specified as follows:

$$NPL_i = \beta_0 + \beta_1 CLA_i + \beta_2 CCM_i + \beta_3 CCP_i + \varepsilon_i$$

Where

NPL = non-performing loans;

CLA = customer loan appraisal;

CCM = credit control and monitoring;

CCP = credit collection policy;

β_0 = intercept term;

β_1 – β_3 = estimated coefficients; and

ε = stochastic error term.

The estimated coefficients are expected to be negative, indicating that stronger credit management practices reduce the likelihood of non-performing loans.

To provide more detailed evidence, additional regression models are estimated using the individual dimensions extracted from the factor analysis:

$$mLLP_i = \beta_0 + \beta_1 BPr_i + \beta_2 BCP_i + \beta_3 Col_i + \beta_4 SAS_i + \beta_5 TCC_i + \beta_6 mCpr_i + \beta_7 FuE_i + \beta_8 LRE_i + \varepsilon_i$$

$$mLBR_i = \beta_0 + \beta_1 BPr_i + \beta_2 BCP_i + \beta_3 Col_i + \beta_4 SAS_i + \beta_5 TCC_i + \beta_6 mCpr_i + \beta_7 FuE_i + \beta_8 LRE_i + e_i$$

Where BPr represents borrower profiling, BCP denotes borrower business condition and loan policy, Col is collateral assessment, TCC represents credit terms and repayment capacity, SAS

captures support and advisory services, Cpr represents credit management compromise, FuE denotes follow-up efforts, and LRE represents loan recovery efforts.

Variance Inflation Factor (VIF) analysis was used to assess multicollinearity, with values below conventional thresholds indicating that collinearity was not a major concern.

RESULTS AND DISCUSSIONS

A survey was conducted from March to June 2022, involving 1,067 questionnaires sent to Nigerian deposit money banks' credit department staff. A response rate of 88.4% was obtained, with 943 copies returned. The final sample size was 667 valid observations, with 276 cases removed for missing data. The response can be considered very high as previous studies reported that response rates usually range from 5–21% (Osma et al., 2022). The study provides demographic data on staff profiles, including age, sex, education, and work experience.

Table 1

Sample characteristics

Variable	Obs	Mean	Std. Dev.	Min	Max
Age	667	1.861	0.727	1	3
Sex	667	0.453	0.498	0	1
Experience	667	1.910	1.029	0	5
Qualification	667	3.259	0.771	1	5
Percentage Analysis of Qualifications		Frequency	Percentage		
SSCE				9	1.3%
OND/NCE				64	9.6%
HND/BSc				382	57.3%
MSc/PhD				169	25.3%
Professional				43	6.4%

Source: Stata 14.2 result output

The staff consists of 45.3% females and 54.7% males, with an average age of 31-40 years and 6-10 years of experience. They have a gender balance in their views on the subject matter. 57.3% have an HND or BSc as their highest academic qualification, while 25.3% have a postgraduate qualification. 6.4% are members of relevant professional bodies such as CIBN. These educated individuals possess the necessary knowledge to answer the questionnaire.

Exploratory Factor Analysis Results

Exploratory Factor Analysis (EFA) was conducted to identify the underlying dimensions of credit management practices and non-performing loans. A principal component analysis was conducted to assess the underlying structure of the 12-item customer loan appraisal questionnaire.

Table 2*Factor Loading for the Rotated Customer Loan Appraisal Factors*

Variable	Factor1	Factor2	Factor3
Q2	0.839		
Q1	0.711		
Q4	0.666		
Q3	0.657		
Q5	0.423		
Q6	0.383		
Q10		0.801	
Q11		0.772	
Q9		0.625	
Q7		0.530	
Q12			0.837
Q8			0.578
Eigenvalue	2.583	2.459	2.409
% of Variance	21.53	20.49	11.74

Source: Stata 14.2 results

Three factors emerged which, by the nature of the questions, we termed borrower's profiling (BPr), borrower's business condition and bank loan policy (BCP), and collateral (Col), corresponding to *Factor 1* – 3 in Table 2, respectively. These factors were considered based on eigenvalues, which range from 2.409 to 2.583 as reported in Table 4. Table 4 also displays the items that make up the three factors, and factor loadings for the rotated factors with less than 0.3 omitted to improve clarity.

The principal component analysis was also carried out on items that make up credit control and monitoring and three factors were identified as presented in Table 3. *Factor 1* was called defined credit terms, borrower's financial condition and repayment capacity (TCC). We refer to *Factor 2* as bank close contact with borrowers for support and advisory services (SAS), and finally, *Factor 3* was named compromise (mCpr). The eigenvalues of these three *Factors* is 4.301, 4.065 and 1.201, respectively.

Table 3*Factor Loading for the Rotated Credit Control and Monitoring Factors*

Variable	Factor 1	Factor 2	Factor 3
Q24	0.840		
Q25	0.759		
Q23	0.754		
Q26	0.716		
Q22	0.610		
Q27	0.599		
Q28	0.548		
Q14		0.708	
Q18		0.701	

Q17		0.696	
Q15		0.613	
Q19		0.579	
Q16		0.573	
Q20		0.571	
Q21		0.518	
Q13		0.518	
Q29		0.498	
Q30			0.852
Eigenvalue	4.301	4.065	1.201
% of variance	23.90	22.58	6.67

Source: Stata 14.2 results output

The principal component analysis was conducted on credit control policy and the results are reported in Table 4.

Table 4

Factor Loading for the Rotated Credit Control Policy Factors

Variable	Factor1	Factor2
Q32	0.803	
Q33	0.797	
Q31	0.738	
Q35	0.582	
Q34	0.571	
Q37		0.812
Q36		0.528
Eigenvalue	2.706	1.511
% of variance	38.65	21.59

Source: Stata 14.2 results output

The first factor, which seems to index follow-up efforts (FuE), loads strongly on the first five items, with the loadings in the first column. The second factor, which seems to index loan recovery effort (LRE), is composed of the two items with loadings in column two of the table.

Finally, a principal component analysis was conducted on non-performing loans and the results were presented in Table 5.

Table 5

Factor Loading for the Rotated Non-Performing Loans Factors

Variable	Factor1	Factor2
Q38	0.863	
Q39	0.838	

Q40	0.745	
Q41	0.583	0.462
Q44		0.832
Q42		0.765
Q43		0.750
Eigenvalue	2.472	2.122
% of variance	35.32	30.33

Source: Stata 14.2 result output

Two factors emerged; the first factor seems to index loan loss provision (LLP) and it loads strongly on the first four items, with the loadings in the first column. The second factor seems to index loan breach and rescheduling (LBR) and is composed of the three items with loadings in column 2 of the table.

Correlation Analysis

Pearson correlation was conducted to investigate bivariate correlations between constructs and non-performing loans and assess multicollinearity (see Table 6).

Table 6

Matrix of Correlations

Variables	mNPL	BPr	BCP	Col	SAS	TCC	mCpr	FuE	LRE
mNPL	1.000								
BPr	-0.226	1.000							
BCP	-0.315	0.622	1.000						
Col	-0.220	0.266	0.285	1.000					
SAS	-0.444	0.445	0.506	0.304	1.000				
TCC	-0.358	0.551	0.676	0.237	0.659	1.000			
mCpr	0.150	-0.033	0.043	-0.441	-0.133	-0.051	1.000		
FuE	-0.440	0.352	0.433	0.284	0.575	0.486	-0.189	1.000	
LRE	-0.180	0.159	0.205	0.439	0.253	0.234	-0.481	0.454	1.000

Source: Stata 14.2 output

The analysis showed no multicollinearity problem, as there was no correlation between any two independent variables exceeding ± 0.7 , as suggested by Dorman et al. (2012).

The PCFA assessed the measurement properties of CLA, CCM, CCP, and NPL. All items loaded significantly onto their underlying constructs (See Table 7).

Table 7

SEM results showing the list of items, loadings, and reliability

Loadings	Coef	z-value	p-value
BCP ← CLA	0.308	8.360	0.000
BPr ← CLA	0.872	45.950	0.000
Col ← CLA	0.097	2.510	0.012
SAS ← CCM	0.930	65.190	0.000
TCC ← CCM	0.419	11.900	0.000
mCpr ← CCM	-0.181	-2.260	0.024
FuE ← CCP	0.937	69.140	0.000
LRE ← CCP	0.239	6.360	0.000
LLP ← mNPL	-0.962	-90.390	0.000
LBR ← mNPL	-0.195	-5.130	0.000

Model fit across the groups: $\chi^2 = 4,262.833$ $df = 75$, $p < 0.001$, $CFI = 0.583$, $TLI = 0.510$, $RMSEA = 0.289$

Note: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Source: Stata 14.2 result output

SEM results tested the relationship between credit management and NPL as expressed by the conceptual model in Figure 1 and the statistical model. The SEM results are shown in Table 8, while factor loadings are shown in Table 7.

Effect of Aggregate Credit Management Practices on Non-Performing Loans

The first objective of this study was to examine whether major dimensions of credit management influence non-performing loans among Nigerian deposit money banks.

Table 8

Results of hypothesized relationship between credit management and NPL

Hypothesized Relationship	Coef.	z-value	p-value	Hypothesis Supported
H1: CLA → NPL	-0.004	-0.120	0.902	Not Supported
H2: CCM → NPL	-0.254	-6.510	0.000	Supported
H3: CCP → NPL	-0.305	-7.830	0.000	Supported

Source: Stata 14.2 result output

The regression results reveal that customer loan appraisal does not have a statistically significant influence on non-performing loans. Although the estimated coefficient is negative, indicating that improved loan appraisal may contribute to reducing loan deterioration, the effect is not sufficiently strong to establish a systematic relationship ($\beta_1 = -0.004$, $z = -0.120$, $p = 0.902$). We do not find support for this (see Table 8). Essentially, our results suggest that customer loan appraisal does not trigger a significant reduction in the non-performing loans of deposit banks in Nigeria. Efforts such as profiling borrowers, assessing borrowers' business condition and bank loan policy, and evaluating collateral do not significantly help in reducing non-performing loans in Nigeria.

One possible explanation is that the existence of formal appraisal procedures does not necessarily guarantee effective implementation. In some banking environments, information asymmetry, inadequate borrower information, and deviations from established lending criteria may reduce the effectiveness of loan appraisal mechanisms. This finding contrasts with studies that report a significant role of borrower screening in reducing credit default (Iyer et al., 2015) but supports evidence suggesting that loan appraisal alone may be insufficient when not complemented by effective post-disbursement monitoring (Odonkor, 2018).

The findings further demonstrate that credit control and monitoring have a significant negative effect on non-performing loans. This suggests that continuous evaluation of borrowers' financial conditions, regular engagement with customers, and adherence to credit control procedures contribute significantly to reducing loan deterioration. Specifically, results from Table 8 enable us to support. The relationships between credit control and monitoring and the loan loss provision were negative and statistically significant ($\beta_2 = -0.254, z = -6.510, p < 0.001$). This suggests that effective credit control and monitoring will lead to a significant decrease in non-performing loans from deposit money banks in Nigeria, holding all other factors constant. This finding is consistent with information asymmetry theory, which argues that monitoring reduces moral hazard by limiting the ability of borrowers to engage in actions that increase default risk after receiving credit (Greenwood et al., 2010). The result also supports previous studies that identify continuous borrower supervision as a critical mechanism for maintaining loan quality (Heitz et al., 2026). Banks in Nigeria can employ credit control and monitoring through the use of defined credit terms, constant assessment of the borrower's financial condition and repayment capacity, close contact with the borrower for support and advisory services, and should not compromise their credit control and monitoring measures to cut down the incidence of non-performing loans.

Similarly, credit collection policy exhibits a significant negative relationship with non-performing loans ($\beta_3 = -0.305, z = -7.830, p < 0.001$). Hence we support and conclude that the relationship between credit control policies and loan loss provision was negative and statistically significant at the 0.05 level. This suggests that, *ceteris paribus*, an increase in credit control policies will lead to a significant decrease in non-performing loans of deposit money banks in Nigeria. This suggests that timely follow-up activities, structured recovery procedures, and enforcement of repayment obligations are essential mechanisms for reducing the accumulation of bad loans.

Effects of Individual Credit Management Dimensions on Non-Performing Loans

To obtain deeper insights into the mechanisms through which credit management influences loan quality, the study further examined the effects of individual credit management dimensions on the two components of non-performing loans: loan loss provision (LLP) and loan breach and restructuring (LBR). The analysis results are reported in Table 11.

Table 9.*Linear regression credit management and non-performing loans*

	Loan loss provision			Loan breach and rescheduling		
	Coef.	t-value	p-value	Coef.	t-value	p-value
BPr	0.082	1.81	0.071*	0.084	2.22	0.027**
BCP	-0.095	-1.77	0.077*	-0.006	-0.10	0.917
Col	-0.08	-1.71	0.087*	-0.136	-3.21	0.001***
SAS	-0.242	-3.98	0.000***	-0.149	-2.77	0.006***
TCC	-0.041	-0.73	0.464	-0.048	-0.86	0.392
mCpr	0.072	3.36	0.001***	0.126	6.10	0.000***
FuE	-0.28	-4.69	0.000***	-0.048	-0.84	0.402
LRE	0.014	0.30	0.766	-0.24	-5.46	0.000***
Constant	0.211	2.90	0.004***	0.369	5.23	0.000***
F-test	31.753			43.004		
Prob > F	0.000			0.000		
R-squared	0.343			0.357		
Number of obs	667			667		

Note: *** $p < .01$, ** $p < .05$, * $p < .1$ **Source:** Stata 14.2 result output

The study found that each model provides a significant fit for the data at a 0.05 level of significance (for the loan loss provision model, $F = 31.753$, $p < 0.001$; while for the loan breach and rescheduling model, $F = 43.004$, $p < 0.001$). Furthermore, R^2 reveals that the eight credit management variables explain the changes in loan loss provision, and loan breach and rescheduling by 34.3% and 35.7%, respectively.

The results indicate that borrower profiling is positively associated with loan breach and restructuring ($\beta_1 = 0.084$, $t = 2.22$, $p = 0.027$). Although this finding appears contrary to theoretical expectations, it may indicate that borrower characteristics become more prominent when banks deal with already risky customers. In line with Lawrence (2009), a borrower's profile is the borrower's character and it is explained as the borrower's past record of credit commitment, pending indebtedness, and borrower's pending or settled legal judgment are indicators of increased loan breach and rescheduling (non-performing loan). This finding corroborates Ogeisia et al. (2014) and Ssekiziyivu et al. (2018) who also found that there is a strong positive relationship between borrower character and loan repayment. The finding suggests that borrower profiling alone may not guarantee lower default rates unless combined with effective monitoring and enforcement mechanisms.

Borrower business conditions and loan policies exhibit a negative but statistically weak relationship with both measures of non-performing loans. This suggests that favourable borrower business environments and appropriate lending conditions may contribute to improved loan quality; however, their influence may be overshadowed by broader economic conditions and borrower behaviour. The findings in this study agree with those of Bofondi and Ropele (2011), who examined the macroeconomic determinants of the quality of bank loans in Italy from 1990 to 2010 and found that changes in the macroeconomic conditions of households and businesses generally affects the quality of loans of conventional banks in Italy. Also, Turan and Koskija (2014) reported a result similar to ours, noting that external events such as general macroeconomic conditions, which could impact the ability of borrowers to repay their loans, can adversely affect non-performing loans.

Collateral assessment significantly reduces loan breach and restructuring ($\beta_3 = -0.136$, $t = -3.21$, $p = 0.001$), highlighting the importance of adequate security in mitigating credit risk. This finding supports the argument that collateral provides lenders with an additional protection mechanism against potential default. Contrary to our findings, Ewert et al. (2002) documented that collateralization does not fully support any of the hypotheses that are advanced to describe the role of collateral and covenants in credit contracts (Ewert et al., 2002).

Support and advisory services demonstrate a significant negative influence on both measures of non-performing loans. Support and advisory services (SAS) lead to a significant decline in non-performing loans ($\beta_4 = -0.242$, $t = -3.98$, $p < 0.001$); similarly, the effect of SAS on loan breach and rescheduling is negative and statistically significant ($\beta_4 = -0.149$, $t = -2.77$, $p = 0.006$). This suggests that maintaining close relationships with borrowers, providing financial guidance, and identifying potential repayment challenges at an early stage improve borrowers' ability to meet their debt obligations. Several authors support the view that borrower engagement and strengthened credit risk management are key strategies for reducing non-performing loans (Stanley & Bwalya, 2026). Regular contact with borrowers, creating an environment where the bank can be viewed as a trusted problem solver and advisor, and building a culture of supporting borrowers in difficulties to cope with the situation can significantly reduce non-performing loans in Nigeria.

The analysis also reveals that credit management compromise has a positive and significant relationship with both loan loss provision and loan breach and restructuring. This implies that deviations from established credit procedures, unethical practices, or weak enforcement of lending standards contribute significantly to the accumulation of non-performing loans. Our results are consistent with Negara (2012), who assessed the determinants of non-performing loans in Ethiopia and revealed that compromised integrity, weak institutional capacity, unfair competition among banks, and willful default by borrowers cause loan default.

Our analysis revealed that well-defined credit terms, borrowers' financial condition and repayment capacity (TCC) are ineffective in curtailing non-performing loans of deposit money banks in Nigeria. In both models (loan loss provision and loan breach and rescheduling), TCC does not have a significant effect at the 0.05 level. This result may be attributed to the Nigerian culture of poor loan repayment. No matter how clearly the terms of the loan are defined, even

when borrowers are capable of repaying their debt, they may be unwilling to do so voluntarily. They (the borrowers) sometimes use adages such as “even the federal government is in debt” or “*injo wuan or ga*,” meaning credit does not kill a man, or “*or lun or ka injo*,” meaning a man is a real man by borrowing, to justify non-repayment.

Follow-up efforts significantly reduce loan loss provisions ($\beta_7 = -0.28$, $t = -4.69$, $p < 0.001$), while loan recovery efforts insignificantly reduce loan breach and rescheduling. These findings demonstrate that effective credit collection mechanisms remain essential in controlling different forms of loan deterioration. Our results are in line with Islam et al. (2005) and Viswanadham and Nahid (2015), who found that individuals prioritize current consumption, so they do not mind spending the borrowed funds for consumption in the absence of strict monitoring. Thus, if borrowers are not followed up, they get the wrong perception that the lender is weak, so borrowers will squander the loan money unwisely, causing non-performing loans.

Finally, this study examined the effect of loan recovery efforts on non-performing loans of deposit money banks in Nigeria. Results from Table 11 show that loan recovery efforts have a negative and significant effect on loan breaches and rescheduling ($\beta_8 = -0.24$, $t = -5.46$, $p < 0.001$). Adhikary (2006) also found that insufficient debt recovery measures on the part of the banks have increased the non-performing loan problem.

The findings from this study demonstrate that credit management is a multidimensional process whose effectiveness depends not only on pre-loan assessment but also on continuous monitoring and post-disbursement recovery mechanisms. While customer loan appraisal alone does not significantly reduce non-performing loans, credit control and monitoring as well as credit collection policies play significant roles in improving loan quality. The results provide empirical support for information asymmetry theory by demonstrating that reducing information gaps and controlling borrower behavior after loan disbursement are critical for preventing loan default. The findings, therefore, suggest that managers of banks should strengthen borrower engagement, enhance monitoring systems, maintain strict adherence to credit policies, and establish effective recovery strategies to minimize the incidence of non-performing loans.

CONCLUSION, IMPLICATIONS, AND FUTURE RESEARCH DIRECTIONS

Conclusion

This study examined the influence of credit management practices on non-performing loans among deposit money banks in Nigeria. Drawing on information asymmetry theory, the study conceptualized credit management as a multidimensional process comprising customer loan appraisal, credit control and monitoring, and credit collection policies. The empirical evidence demonstrates that not all credit management practices contribute equally to the reduction of non-performing loans.

The findings reveal that customer loan appraisal, although negatively associated with non-performing loans, does not exert a statistically significant effect. In contrast, credit control and monitoring, as well as credit collection policies, significantly reduce non-performing loans.

The additional analysis further shows that specific mechanisms, such as borrower support and advisory services, collateral assessment, continuous follow-up, and effective loan recovery procedures, play important roles in improving loan quality, whereas compromises in credit administration contribute to higher levels of loan deterioration.

The study suggests that effective credit risk management extends beyond the initial assessment of borrowers. The ability of banks to continuously monitor borrowers, maintain effective communication, enforce lending conditions, and implement timely recovery strategies represents a more critical mechanism for controlling the growth of non-performing loans.

Theoretical Contributions

This study contributes to the credit risk management and banking literature in several important ways. First, it extends the application of information asymmetry theory by demonstrating that information-related problems are not limited to the loan approval stage but continue throughout the life cycle of a credit facility. Consequently, post-disbursement monitoring and enforcement mechanisms appear to be more effective in reducing non-performing loans than relying exclusively on ex-ante borrower screening.

Second, the study advances prior literature by conceptualizing credit management as a multidimensional construct rather than treating it as a single banking activity. By distinguishing among customer loan appraisal, credit control and monitoring, and credit collection policies, the study provides a more nuanced understanding of the channels through which internal credit management mechanisms influence loan quality.

Third, this study provides empirical evidence from Nigeria, an important emerging banking market where institutional characteristics, information constraints, and credit enforcement challenges may shape the effectiveness of risk management practices differently from developed economies(Oyasor, 2025). The findings therefore contribute to the growing body of evidence from developing and emerging economies.

Practical and Policy Implications

The findings offer important implications for bank managers, regulators, and policymakers. For bank managers, the evidence suggests that improving credit quality requires greater emphasis on post-disbursement credit administration. Banks should strengthen continuous monitoring systems, maintain regular engagement with borrowers, provide advisory support where necessary, and implement effective follow-up and recovery mechanisms.

The insignificant effect of customer loan appraisal does not imply that pre-lending assessment should be neglected; rather, it indicates that effective screening must be supported by strict compliance with lending decisions and continuous monitoring after credit disbursement. Banks should therefore integrate pre-loan assessment with robust post-loan management frameworks.

For regulators, particularly the Central Bank of Nigeria and other supervisory agencies, the findings highlight the need to strengthen regulatory oversight relating to credit administration practices, compliance with lending standards, and the effectiveness of loan recovery

mechanisms. Regulatory frameworks that encourage early identification of distressed loans and proactive intervention may contribute to improved banking sector stability.

Limitations and Future Research Directions

Although this study provides valuable insights into the relationship between credit management practices and non-performing loans, several limitations should be acknowledged. First, the study adopts a cross-sectional research design, which limits the ability to establish causal relationships between credit management practices and loan outcomes over time. Future studies may employ longitudinal designs to examine how changes in credit management practices influence loan quality across different periods.

Second, the study relies on self-reported questionnaire responses from banking personnel. While this approach provides valuable information regarding internal credit management practices, future research may combine survey evidence with archival bank-level financial data, such as actual non-performing loan ratios and loan performance indicators, to enhance the robustness of the findings.

Third, the study focuses on deposit money banks operating in Nigeria. Therefore, the findings may be influenced by country-specific institutional, economic, and regulatory conditions. Future studies should conduct comparative analyses across African countries or other emerging economies to determine whether the effectiveness of credit management practices differs across institutional environments.

Finally, future research may examine additional organizational and environmental factors, such as corporate governance mechanisms, risk culture, technological adoption in credit monitoring, and macroeconomic shocks, that may influence the relationship between credit management practices and non-performing loans.

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