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NON-PERFORMING LOANS AND FINANCIAL STABILITY OF NIGERIAN DEPOSIT MONEY BANKS

Adedipe, Oluwaseyi Ayodele Ph.D.
Department of Accounting and Finance
Ajayi Crowther University, Oyo, Oyo State, Nigeria

Abstract: **This study examines the impact of non-performing loans on the financial stability of Nigerian Deposit Money Banks over the period 2008 to 2024 using an unbalanced panel dataset of ten listed commercial banks. The study employs fixed effects panel regression and the System Generalised Method of Moments to address potential endogeneity,unobserved heterogeneity, and reverse causality. The findings reveal that non performing loan ratios have a significant negative effect on the Z Score, Capital Adequacy Ratio, and Return on Assets, while they exert a positive effect on the Loan to Deposit Ratio, indicating that increasing credit risk weakens bank solvency, capital adequacy, and profitability while increasing liquidity exposure. Macroeconomic variables such as gross domestic product growth and inflation are found to significantly moderate these relationships, reflecting the influence of broader economic conditions on bank stability. Furthermore, the threshold analysis shows that when non-performing loans exceed the Central Bank of Nigeria regulatory benchmark of five percent, financial stability deteriorates more sharply and in a non linear manner. The study therefore recommends strengthened credit appraisal and monitoring systems, enhanced early warning surveillance by the Central Bank of Nigeria, strict enforcement of prudential guidelines, and effective implementation of recapitalisation policies to improve the resilience and stability of the banking sector.**

Keywords: **Non-Performing Loans, Financial Stability, Nigerian Deposit Money Banks, Capital Adequacy, Z-Score, Panel Data, GMM JEL Classification: G21, G28, G32, E44, C23**

I. INTRODUCTION

The stability of a nation's banking sector is widely regarded as indispensable to macroeconomic health, financial intermediation efficiency, and sustainable economic development (Onaolapo et al., 2026). Deposit Money Banks (DMBs) in Nigeria occupy a pivotal role in this regard, channelling credit to the real sector, facilitating payments, and serving as the primary conduit for monetary policy transmission. Yet, the persistent challenge of non-performing loans (NPLs) continues to threaten the resilience of Nigerian banks, exposing the financial system to periodic episodes of distress (Saif-Alyousfi, 2025; Yahaya, 2026).

Non-performing loans represent credit facilities on which borrowers have failed to service principal or interest obligations for a period typically exceeding 90 days. The accumulation of NPLs diminishes bank profitability, erodes capital buffers, constrains new credit creation, and at systemic levels can precipitate banking crises. Nigeria's banking history is replete with such episodes: the 2008-2009 banking crisis, which necessitated a N620 billion Central Bank of Nigeria (CBN) bailout and the eventual creation of the Asset Management Corporation of Nigeria (AMCON), offers the most salient illustration of NPL-induced systemic fragility.

The stability of the banking sector is fundamental to the growth and development of any economy, as Deposit Money Banks serve as key intermediaries in mobilizing savings and allocating credit to productive sectors. In Nigeria, the banking system plays a critical role in financial intermediation, payment facilitation, and economic stabilization. However, the effectiveness of these roles is often threatened by rising levels of nonperforming loans, which represent loans that are no longer generating income due to default or delayed repayment. When non performing loans increase, banks face liquidity pressures, declining profitability, and weakened capital positions, all of which ultimately undermine financial stability.

In recent years, the Nigerian banking sector has continued to experience fluctuations in credit quality, largely influenced by macroeconomic instability, exchange rate volatility, inflationary pressures, and structural weaknesses in credit appraisal systems. These challenges have contributed to persistent concerns about the sustainability of bank lending activities and the overall health of financial institutions. Despite regulatory interventions by the Central Bank of Nigeria, including stricter prudential guidelines and periodic recapitalisation requirements, non performing loans remain a recurring issue in the banking system. This raises concerns about the effectiveness of existing risk management frameworks in ensuring long term stability.

Empirical studies on the relationship between non performing loans and financial stability have produced mixed and sometimes conflicting results. While some studies establish a strong negative relationship between non performing loans and bank performance indicators such as profitability, capital adequacy, and liquidity, others suggest that the impact may vary depending on macroeconomic conditions, bank size, and regulatory environment. Furthermore, limited attention has been given to threshold effects, particularly whether there exists a critical level of nonperforming loans beyond which financial stability deteriorates more rapidly. This gap is especially relevant in the Nigerian context, where regulatory benchmarks such as the five percent threshold are used to guide banking operations.

Against this background, this study examines the effect of nonperforming loans on the financial stability of Deposit Money Banks in Nigeria over the period 2008 to 2024. It employs a robust panel data framework and the System Generalised Method of Moments estimator to address potential endogeneity and provide more reliable estimates. By incorporating macroeconomic variables and exploring threshold effects, the study provides deeper insight into how credit risk influences banking stability in Nigeria. The findings are expected to contribute to policy formulation aimed at strengthening credit risk management, enhancing regulatory oversight, and improving the resilience of the Nigerian banking sector.

Despite regulatory reforms including the CBN's 5% NPL benchmark, the recapitalisation policy, prudential guidelines, and Basel III adoption NPL ratios in Nigerian DMBs have remained elevated and volatile. As of 2022, the industry-wide NPL ratio stood at approximately 4.9%, having peaked at 14.8% in 2017 following the twin shocks of oil price collapse and foreign exchange illiquidity. The macroeconomic turbulence of the post-COVID era, Nigeria's persistent inflationary pressures, naira devaluation, and fiscal instability have renewed concerns about asset quality and systemic stability.

The academic literature examining the NPL-financial stability nexus in Nigeria remains relatively thin, particularly studies employing dynamic panel estimation techniques that adequately address endogeneity. Most extant studies focus on bank profitability (ROA/ROE) as the sole measure of performance, ignoring broader stability indicators such as the Z-Score and Capital Adequacy Ratio. Moreover, the threshold beyond which NPLs become systemically destabilising a policy-relevant question has not been empirically established for the Nigerian context.

Against this backdrop, this study makes the following contributions: first, it employs a comprehensive multi-dimensional measure of financial stability, encompassing the Z-Score (distress probability), CAR (capitalisation), ROA (profitability), and LDR (liquidity risk); second, it addresses endogeneity using the System GMM estimator; third, it conducts a threshold analysis to identify the NPL ratio at which stability deterioration becomes pronounced; and fourth, it covers the 2008–2024 period, encompassing the post-crisis recapitalisation, the oil price shock era, and COVID-19, offering a historically rich analytical window.

The remainder of this paper is structured as follows: Section 2 reviews related literature; Section 3 describes the methodology; Section 4 presents and discusses empirical results; and Section 5 concludes with policy recommendations.

II. LITERATURE REVIEW

Conceptual Review

The concept of non-performing loans is anchored in the broader framework of credit risk, the risk that a borrower will fail to meet contractual obligations (Semusu et al., 2026). Under CBN Prudential Guidelines, a loan is classified as non-performing when principal or interest remains unpaid for 90 days or more. NPLs are further stratified into Substandard (90–179 days), Doubtful (180–359 days), and Lost (360+ days) categories, each attracting increasing provisioning requirements of 10%, 50%, and 100%, respectively. Nwaguruet al (2025) sees it as loans in which the borrower has failed to make scheduled principal or interest payments for a specified period, usually 90 days or more. In this context, a loan is classified as non-performing when it ceases to generate income for the financial institution due to prolonged default or significant doubt about full repayment. Non-performing loans are commonly used as an indicator of asset quality and banking sector stability, as a high level of NPLs signals increased credit risk and potential financial distress within the banking system

Financial stability refers to a condition in which the financial system covering financial intermediaries, markets, and market infrastructureis capable of withstanding shocks without major disruption to financial intermediation and the supply of financial services (Bozic& Bozic, 2025). At the bank level, stability is operationalised through capitalisation adequacy, earnings sustainability, liquidity sufficiency, and asset quality. Olawale and Obinna (2023) define it as a condition in which the financial system comprising financial institutions, markets, and payment systems operates efficiently and is capable of withstanding shocks without significant disruption to financial intermediation or the allocation of savings to productive investments. It implies a sound and resilient financial environment where risks are properly managed, institutions remain solvent, and the system continues to support sustainable economic growth even in the face of internal or external disturbances.

Theoretical Framework

This study is anchored on the Financial Intermediation Theory as propounded by Douglas Diamond and Philip Dybvig (1983). The theory posits that banks perform a

critical intermediation role by mobilizing deposits from surplus units and channeling them as credit to deficit units, thereby facilitating liquidity creation and economic stability. However, the theory argues that the stability of banks depends largely on the quality of their assets, particularly their loan portfolio. When non-performing loans increase, the value of bank assets deteriorates while liabilities to depositors and creditors remain fixed, thereby weakening banks' balance sheets and exposing them to liquidity stress, insolvency risk, and possible bank runs. Thus, the theory establishes that poor loan performance threatens the soundness and resilience of deposit money banks, making non-performing loans a major determinant of financial stability.

The relevance of the Financial Intermediation Theory to this study lies in its explanation of how rising non-performing loans can impair the ability of deposit money banks to perform their intermediation functions effectively, thereby undermining financial stability. Persistent growth in non-performing loans reduces profitability, erodes capital adequacy, constrains lending capacity, and heightens systemic vulnerabilities within the banking sector. This aligns with the proposition of the theory that deterioration in asset quality weakens confidence in financial institutions and disrupts the smooth functioning of the financial system. Therefore, the theory provides a sound analytical foundation for examining the impact of non-performing loans on the financial stability of deposit money banks, as it links credit risk exposure directly to the stability and survival of banking institutions.

Empirical Literature

Badeki et al. (2026) investigated the impact of credit risk on the financial performance of listed deposit money banks in Nigeria using a correlational research design and secondary data from 13 banks covering 2015–2024. The study employed Panel Corrected Standard Errors (PCSE) regression technique and found that loan loss provision ratio has a negative and significant effect on return on assets, non-performing loan coverage ratio exerts a positive and significant effect on financial performance, while non-performing loan ratio has a negative but insignificant effect on profitability.

Wahyudin et al. (2026) investigated the effect of non-performing financing and financing-to-deposit ratio on return on assets using secondary data from quarterly financial reports for the period 2019–2024 and multiple linear regression analysis. The findings revealed that non-performing financing has a negative but insignificant effect on profitability, while financing-to-deposit ratio has a negative and significant effect on return on assets, although both variables jointly exert a significant influence on financial performance.

Elshani (2025) investigated the relationship between non-performing loans, deposits and financial stability in developing European nations using panel data from 2010–2024 and econometric techniques including OLS, Fixed Effects, Random Effects and Generalized Method of Moments. The findings revealed that non-performing loans have a negative and significant effect on financial stability, although their relationship with deposits was positive in the baseline models, while private sector lending and bank liquid reserves significantly drive deposit growth.

Abubakar and Dame (2025) investigated the impact of non-performing loans and liquidity on the financial performance of deposit money banks in Nigeria using a quantitative research design and data from 14 listed banks covering 2017–2023. The study employed linear regression and correlation analysis and found that non-performing loans have a negative but insignificant effect on return on equity, while liquidity has a negative and significant effect on financial performance, implying that excessive liquidity may constrain bank profitability.

Magaji and Ahmad (2024) investigated the impact of non-performing loans on the performance of deposit money banks in Nigeria within the context of digitalized banking policy using Panel Autoregressive Distributed Lag (ARDL) analysis and data from selected banks sourced from the Central Bank of Nigeria and financial statements. The findings revealed that non-performing loans have a negative but insignificant effect on return on equity, indicating an inverse relationship with bank performance, though the impact was not statistically substantial.

Atsu et al. (2024) investigated the effect of non-performing loans on the financial performance of commercial banks in Ghana using data from 2010 to 2021 and quantitative analysis of the relationship between non-performing loans, loan-to-deposit ratio and profitability. The findings revealed that non-performing loans have a positive and significant relationship with return on assets, while loan-to-deposit ratio also showed a positive and significant relationship with financial performance.

Ugulu and Odion (2023) investigated the effect of non-performing loans on the profitability of deposit money banks in Nigeria using time series data from 1990–2020 and the Autoregressive Distributed Lag (ARDL) and Vector Error Correction Model (VECM) techniques. The findings revealed that non-performing loan ratios have a negative and significant effect on return on assets and return on equity, indicating that persistent increases in bad loans reduce the profitability of deposit money banks in Nigeria.

III. METHODOLOGY

Data and Sample

This study utilises annual panel data covering ten (10) publicly listed Nigerian Deposit Money Banks over the period 2008–2024. The selected banks include Access Bank, Zenith Bank, GTBank, First Bank of Nigeria, UBA, Fidelity Bank, Union Bank, Sterling Bank, Wema Bank, and Stanbic IBTC. The selection is based on data availability and

continuous listing on the Nigerian Exchange Group (NGX) throughout the study period. Bank-level data were sourced from the annual reports and accounts of each bank, supplemented by the CBN Statistical Bulletin and NDIC Annual Reports. Macroeconomic variables GDP growth rate and headline inflation were obtained from the National Bureau of Statistics (NBS) and the World Bank Development Indicators database.

Variable Measurement

The dependent variable, financial stability, is proxied through four measures: the Altman Z-Score, calculated using the Altman (1968) formula adapted for financial institutions, which combines liquidity, profitability, leverage, solvency, and activity ratios a higher Z-Score indicates lower distress probability; the Capital Adequacy Ratio (CAR), representing Tier 1 and Tier 2 capital as a percentage of risk-weighted assets the CBN minimum benchmark is 15% for systemically important banks and 10% for others; Return on Assets (ROA), measured as net income divided by total assets; and the Loan-to-Deposit Ratio (LDR), measuring liquidity risk exposure.

The primary independent variable is the NPL Ratio, defined as the ratio of non-performing loans to total gross loans. Bank-level control variables include Bank Size (natural logarithm of total assets) and the Loan-to-Deposit Ratio. Macroeconomic controls comprise Real GDP Growth Rate and Consumer Price Index-based Inflation Rate.

Model Specification

The baseline fixed effects panel model is specified as:

$$FS_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 SIZE_{it} + \beta_3 LDR_{it} + \beta_4 GDP_t + \beta_5 INF_t + \mu_i + \lambda_t + \varepsilon_{it} \quad (1)$$

Where:

Whereα is the intercept, $\beta_1 - \beta_5$ represents coefficient of the explanatory variables, FS_{it}denotes financial stability for bank i at time t; NPL_{it} is the non-performing loan ratio; $SIZE_{it}$ is the natural log of total assets; LDR_{it} is the loan-to-deposit ratio; GDP_t is GDP growth; INF_t is inflation; $\mu_i$captures bank-specific fixed effects;λ_t captures time fixed effects; ε_{it} is the idiosyncratic error term.

To address endogeneity particularly the potential reverse causality between NPLs and financial stability the System Generalised Method of Moments (Sys-GMM) estimator proposed by Blundell and Bond (1998) is employed as the primary estimation technique.

For the System Generalised Method of Moments (Sys-GMM) framework, the model is specified in a dynamic panel form as follows:

$$FS_{it} = \alpha FS_{it-1} + \beta_1 NPL_{it} + \beta_2 SIZE_{it} + \beta_3 LDR_{it} + \beta_4 GDP_t + \beta_5 INF_t + \mu_i + \lambda_t + \varepsilon_{it} \quad (2)$$

Where: αFS_{it-1} is the lagged dependent variable capturing persistence in financial performance.

In the System-GMM estimation, the equation is estimated jointly in both first-differenced and level forms, using lagged levels of the endogenous variables as instruments for the differenced equation and lagged differences as instruments for the level equation. This helps to address endogeneity, omitted variable bias, and measurement error.

Instrument validity is tested using the Hansen J-test of over-identifying restrictions, while the Arellano-Bond AR(1) and AR(2) tests are used to confirm the absence of first-order and second-order serial correlation in the error term.

Empirical Results

Descriptive Statistics

Table 1 presents descriptive statistics for all variables. The mean NPL ratio of 9.84% exceeds the CBN benchmark of 5%, underscoring the persistent credit quality challenge in the Nigerian banking sector. The wide standard deviation (5.62%) and range (2.10% to 28.30%) reflect significant heterogeneity across banks and time. The average Z-Score of 18.67 suggests moderate overall financial stability, while the mean CAR of 16.23% indicates general compliance with regulatory capital requirements. The mean ROA of 1.74% reflects modest profitability, consistent with the challenging operating environment characterised by high inflation (mean: 14.32%) and volatile growth (mean: 2.87%).

Table 1: Descriptive Statistics of Study Variables

Variable	Mean	Std. Dev.	Min	Max	Skewness
NPL Ratio (%)	9.84	5.62	2.1	28.3	1.43
Z-Score	18.67	7.34	3.21	41.5	-0.62
CAR (%)	16.23	3.91	8.4	27.6	0.21
ROA (%)	1.74	1.18	-2.3	5.1	-0.87
LDR (%)	62.47	12.33	31.2	94.1	0.14
Bank Size (log)	20.43	1.62	16.8	23.9	-0.33
GDP Growth (%)	2.87	2.14	-1.79	7.2	-0.91
Inflation (%)	14.32	6.71	7.8	33.2	1.12

Source: Author's computation, 2026

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Correlation Analysis

Table 2 presents the Pearson correlation matrix. The NPL ratio is significantly and negatively correlated with the Z-Score (-0.612), CAR (-0.541), and ROA (-0.488), all significant at the 1% level — providing initial evidence of the adverse stability effects of credit risk. The negative correlation between NPLs and GDP growth (-0.441) is consistent with the procyclicality thesis: economic downturns worsen loan quality. No serious multicollinearity issues are detected, as no inter-variable correlation exceeds 0.80.

Table 2: Pearson Correlation Matrix

Variable	NPL	Z-Score	CAR	ROA	LDR	SIZE	GDP
NPL	1.000	-0.612***	-0.541***	-0.488***	0.312**	-0.223**	-0.441***
Z-Score		1.000	0.673***	0.591***	-0.287**	0.314**	0.423***
CAR			1.000	0.448***	-0.312**	0.271**	0.302**
ROA				1.000	-0.267**	0.341***	0.381***
LDR					1.000	0.189*	-0.213*
SIZE						1.000	0.142
GDP							1.000

Note: ***, **, * denote statistical significance at 1%, 5%, and 10% levels respectively. Source: Author's computation.

Panel Diagnostic Tests

Table 3 presents results of pre-estimation diagnostic tests. The Hausman test (Chi^2= 31.47, p = 0.0001) firmly rejects the random effects model in favour of fixed effects. The Breusch-Pagan LM test confirms the presence of individual effects, invalidating pooled OLS. The Modified Wald test reveals heteroskedasticity, and the Wooldridge test detects first-order autocorrelation in the panel residuals. Pesaran's CD test further confirms cross-sectional dependence. Collectively, these diagnostics justify the use of Driscoll-Kraay standard errors in the fixed effects estimation and the System GMM as a robustness estimator.

Table 3: Panel Diagnostic Tests

Test	Statistic	df / p-value	Decision
Hausman Test (FE vs RE)	Chi^2= 31.47	p = 0.000	Fixed Effects
Breusch-Pagan LM Test	Chi^2= 87.23	p = 0.000	Reject Pooled OLS
Modified Wald Test (Heteroskedasticity)	Chi^2= 112.64	p = 0.000	Heteroskedastic
Wooldridge Test (Autocorrelation)	F = 14.32	p = 0.000	Serial Correlation
Cross-Sectional Dependence (Pesaran)	CD = 3.87	p = 0.000	CD Present

Source: Author's computation, 2026

Panel Unit Root Tests

To guard against spurious regression, unit root tests are conducted using three complementary tests Levin, Lin, and Chu (LLC); Im, Pesaran, and Shin (IPS); and the ADF-Fisher Chi-squared test. As reported in Table 4, all variables reject the null hypothesis of a unit root at the level, confirming integration of order zero, I(0), and establishing the stationarity of the panel series. This validates the use of fixed effects and GMM estimation without differencing.

Table 4: Panel Unit Root Test Results

Variable	LLC Statistic	IPS Statistic	ADF-Fisher	Integration Order
NPL Ratio	-4.321***	-3.891***	64.23***	I(0)
Z-Score	-5.112***	-4.234***	71.44***	I(0)
CAR	-3.876***	-3.541***	58.91***	I(0)
ROA	-6.213***	-5.781***	89.32***	I(0)
LDR	-2.143**	-1.987**	41.23**	I(0)
GDP Growth	-4.567***	-4.123***	68.77***	I(0)
Inflation	-1.891**	-1.743*	38.44**	I(0)

Note: ***, **, * denote rejection of unit root null at 1%, 5%, and 10% significance levels. LLC = Levin, Lin & Chu; IPS = Im, Pesaran & Shin. Source: Author's computation.

Regression Results

Table 5 presents the fixed effects panel regression results across four models. Model 1 (dependent variable: Z-Score) reveals that the NPL ratio exerts a significant negative effect on financial stability (β = -0.823, t = -5.41, ρ< 0.01). This finding indicates that a one percentage point increase in the

International Journal of Engineering Applied Sciences and Technology, 2026
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NPL ratio is associated with a decline of approximately 0.82 units in the Z-Score, significantly elevating distress probability. Model 2 confirms that NPLs erode capital adequacy (β = -0.612, ρ< 0.01), while Model 3 establishes a negative effect on profitability (β = -0.147, ρ< 0.01). Model 4 reveals a positive NPL-LDR relationship (β = 0.341, ρ< 0.05), suggesting that rising credit risk is associated with increased liquidity exposure as banks mobilise deposits to offset impaired loan portfolios.

Bank size exhibits positive and significant coefficients in Models 1–3, consistent with the 'too-big-to-fail' hypothesis and economies of scale in risk management. GDP growth improves stability across all models, while inflation consistently exerts a negative effect, reflecting the erosion of borrower repayment capacity and real loan value under inflationary conditions. The R-squared values range from 0.43 to 0.68, indicating strong explanatory power.

Table 5: Fixed Effects Panel Regression Results — NPLs and Financial Stability

Variable	Model 1 (Z-Score)	Model 2 (CAR)	Model 3 (ROA)	Model 4 (LDR)
NPL Ratio	-0.823*** (-5.41)	-0.612*** (-4.87)	-0.147*** (-3.92)	0.341** (2.13)
Bank Size	2.341*** (4.12)	1.234** (2.98)	0.312*** (3.21)	-1.123** (-2.45)
Loan-to-Deposit Ratio	-0.134** (-2.76)	0.18522	-0.023** (-2.14)	—
GDP Growth	0.612*** (3.87)	0.421** (2.67)	0.087** (2.43)	0.37488
Inflation	-0.387*** (-3.21)	-0.213** (-2.54)	-0.062** (-2.87)	0.189** (2.34)
Constant	12.341*** (6.78)	9.876*** (5.43)	2.143*** (4.56)	48.231*** (8.91)
R-squared	0.6812	0.6241	0.5934	0.4312
F-statistic	41.23***	34.87***	29.14***	16.78***
Time Fixed Effects	Yes	Yes	Yes	Yes
Bank Fixed Effects	Yes	Yes	Yes	Yes

Note: t-statistics in parentheses. ***, **, * denote 1%, 5%, and 10% significance levels. Driscoll-Kraay standard errors applied. Source: Author's computation.

Robustness Check: System GMM Results

Table 6 presents the System GMM (Sys-GMM) and Difference GMM (Diff-GMM) results as robustness checks. The lagged dependent variable is positive and significant across all models (ρ< 0.01), confirming the dynamic nature of financial stability. Crucially, the NPL ratio retains its negative and significant effect on the Z-Score (β = -0.791, ρ< 0.01), CAR (β = -0.584, ρ< 0.01), and ROA (β = -0.131, ρ< 0.01) under the Sys-GMM specification — validating the robustness of the fixed effects results after controlling for endogeneity.

The Arellano-Bond AR(2) tests yield p-values well above 0.10, confirming the absence of second-order serial correlation in the residuals. The Hansen J-test p-values (ranging from 0.23 to 0.32) are above 0.10, confirming instrument validity. These diagnostic outcomes lend credibility to the GMM estimates.

Table 6: System GMM and Difference GMM Robustness Results

Variable	Sys-GMM (Z-Score)	Sys-GMM (CAR)	Sys-GMM (ROA)	Diff-GMM (Z-Score)
Lagged Dep. Var.	0.431*** (5.23)	0.387*** (4.91)	0.362*** (4.34)	0.298*** (3.87)
NPL Ratio	-0.791*** (-4.98)	-0.584*** (-4.41)	-0.131*** (-3.67)	-0.743*** (-4.12)
Bank Size	2.187*** (3.87)	1.102** (2.67)	0.287*** (3.01)	1.934*** (3.54)
GDP Growth	0.589*** (3.54)	0.398** (2.43)	0.081** (2.21)	0.541*** (3.12)
Inflation	-0.341** (-2.87)	-0.198** (-2.31)	-0.057** (-2.43)	-0.312** (-2.54)

International Journal of Engineering Applied Sciences and Technology, 2026
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Arellano-Bond AR(1)	p = 0.0012	p = 0.0021	p = 0.0034	p = 0.0018
Arellano-Bond AR(2)	p = 0.3241	p = 0.2981	p = 0.4123	p = 0.3671
Hansen J-Test (p-value)	0.2341	0.3187	0.2876	0.2543

Note: t-statistics in parentheses. ***, **, * denote 1%, 5%, and 10% significance. AR(2) p-values > 0.10 confirm no second-order autocorrelation. Hansen p-values > 0.10 confirm instrument validity. Source: Author's computation.

NPL Threshold Analysis

Table 7 presents result of the threshold analysis, which stratifies the sample into four NPL bands and computes average Z-Scores and CAR within each band. The results reveal a clear monotonic deterioration in financial stability as the NPL ratio increases. Banks with NPL ratios below 5% (the CBN regulatory threshold) record a mean Z-Score of 26.43 and mean CAR of 19.87%, placing them firmly in the 'Stable' category. As NPLs rise above 15%, the Z-Score collapses to 7.23 and CAR falls to 9.87%, falling below the CBN's 10% minimum requirement and signalling financial distress. These findings establish that the CBN's 5% NPL benchmark is not merely a supervisory formality but a critical stability threshold. Exceeding this threshold initiates a non-linear deterioration in banking sector resilience, with the most precipitous declines occurring in the 10–15% and above-15% bands.

Table 7: NPL Threshold Analysis — Financial Stability Indicators by NPL Band

NPL Range (%)	Avg. Z-Score	Avg. CAR (%)	Financial Stability Status
< 5.0	26.43	19.87	Stable
5.0 – 10.0	19.12	16.23	Moderately Stable
10.0 – 15.0	13.54	13.41	Vulnerable
> 15.0	7.23	9.87	High Risk / Distressed
CBN Regulatory Threshold: 5.0% — Exceedance significantly undermines financial stability			

Source: Author's computation. Classification based on author-defined NPL bands using panel dataset.

IV. CONCLUSION AND POLICY RECOMMENDATIONS

This study provides robust empirical evidence that non-performing loans have a significant negative effect on the financial stability of Deposit Money Banks in Nigeria. The results, based on multiple stability indicators including Z Score, Capital Adequacy Ratio, Return on Assets, and Loan to Deposit Ratio, consistently show that rising NPL levels weaken bank stability. These findings remain stable even after controlling for macroeconomic factors, bank specific effects, time effects, and through dynamic System GMM estimation, confirming the presence of endogeneity adjusted relationships. Furthermore, the threshold analysis reveals that once NPLs exceed the Central Bank of Nigeria five percent benchmark, the deterioration in financial stability becomes more pronounced and nonlinear, highlighting the critical importance of maintaining credit risk within regulatory limits.

Based on these findings, several policy recommendations are proposed. The Central Bank of Nigeria should strengthen its early warning and supervisory framework through real time monitoring of NPLs and more frequent stress testing, particularly for systemically important banks. The Asset Management Corporation of Nigeria intervention mechanism should also be restructured to enable earlier resolution of bad loans before they escalate into systemic distress. In addition, Deposit Money Banks should enhance credit risk management practices by adopting advanced credit scoring models and improving sector specific loan appraisal systems. The ongoing recapitalisation policy of the Central Bank of Nigeria is strongly supported, as higher capital buffers will improve resilience against credit shocks. Finally, macroprudential tools such as countercyclical capital buffers should be actively enforced to mitigate NPL accumulation during economic downturns. The study is limited by its focus on listed banks only and the exclusion of qualitative governance factors; future research could extend the analysis to sectoral loan composition and regulatory forbearance effects on bank stability.

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