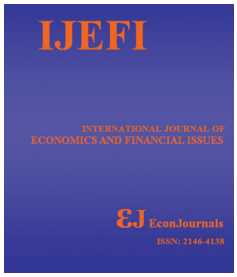

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Risk Governance, Regulatory Enforcement, and Profitability in Nigerian Banks: Evidence from a Decade of Financial Reforms

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ABSTRACT

This study examines how credit risk management influences the profitability of banks in Nigeria, focusing on key variables such as capital adequacy, non-performing loans (NPLs), liquidity, and loan-to-asset ratios. Employing multiple regression and panel data analysis, the research evaluates data from 15 Nigerian banks over the 2013–2023 period. The results reveal that strong credit risk practices, including diligent loan monitoring and proactive NPL handling, positively impact profitability. Nevertheless, issues like high offshore borrowing and weak risk framework implementation undermine financial stability. The study concludes that while regulatory policies are beneficial, their inconsistent enforcement and institutional shortcomings pose significant barriers. Accordingly, it recommends improving risk management systems, enforcing regulations more consistently, diversifying loan portfolios, and minimizing dependence on offshore funding to boost profitability and enhance financial stability in Nigerian banks.

Keywords: Credit Risk Management, Bank Profitability, Non-performing Loans, Capital Adequacy, Nigeria, Financial Stability
JEL Classifications: G21, G32, E44, C33

1. INTRODUCTION

The profitability and resilience of commercial banks play a pivotal role in ensuring financial system stability, particularly in emerging markets where banks are the primary channels for capital allocation and credit delivery. In Nigeria, the banking industry has experienced considerable reforms over the past twenty years, aimed at consolidation, technological advancement, and stronger regulatory frameworks. Despite these developments, credit risk continues to pose a major threat to bank profitability and overall financial stability (Okoye et al., 2021; Uche and Oladipo, 2022). Primarily stemming from loan defaults, credit risk undermines asset quality, diminishes revenue streams, and increases banks' vulnerability to financial distress.

As such, credit risk management is a crucial factor influencing banking performance. It involves strategic processes for assessing, monitoring, and reducing exposure to potential loan losses. Metrics such as Non-Performing Loans (NPLs), Loan Loss Provisions (LLPs), Loans and Advances (L&A), and Fixed Deposits (FDs) serve as key empirical indicators for analyzing the impact of credit risk on profitability. According to Adegbite and Abubakar (2023), sound credit risk management not only ensures financial resilience but also builds stakeholder trust and supports regulatory compliance. Nonetheless, in the Nigerian context, the dynamics between credit risk indicators and profitability measures like Return on Assets (ROA) and Return on Equity (ROE) remain insufficiently examined, especially amid recent economic shocks from global health crises and exchange rate volatility.

This study addresses this research gap by assessing how credit risk management affects the profitability of Nigerian commercial banks using panel regression techniques. Utilizing data from several deposit money banks across multiple years, the study explores how fluctuations in NPLs, LLPs, L&A, and FDs influence financial performance. Building on recent empirical literature, the research is anchored in the risk-return trade-off theory, which

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posits that increased returns can be achieved through calculated and well-managed risk-taking (Ibe et al., 2020; Bello and Afolayan, 2021).

Evidence from other emerging economies suggests that weak credit risk oversight is a major contributor to declining banking sector profitability (Nyasha and Odhiambo, 2022; Kumar and Singh, 2024). In Nigeria, high levels of non-performing loans have adversely impacted bank earnings and increased the costs of provisioning (Chukwu and Ogunleye, 2023). Additionally, a concentration of loans in volatile sectors like oil and gas exacerbates credit exposure. Thus, improving loan diversification strategies, enhancing provisioning policies, and implementing real-time credit surveillance systems are essential for boosting profitability.

Initial results from this study reveal that credit risk indicators have a significant effect on profitability outcomes. Notably, increased NPLs are associated with reductions in ROA and ROE, while effective LLPs and well-structured L&A portfolios positively influence profitability. These findings align with the perspective that banks with strong credit risk systems are better equipped to manage asset quality risks and maintain steady earnings (Salako et al., 2022; Musa and Lawal, 2025). Moreover, fixed deposits emerge as a reliable source of funding that supports credit growth without undermining liquidity positions.

By providing empirical insights into the credit risk–profitability nexus in Nigeria's banking sector, this research enriches the broader discourse on financial performance, risk control, and governance in developing countries. The findings offer practical implications on multiple fronts. For banking executives, the study highlights the value of proactive, data-driven risk management for sustaining earnings. For regulators such as the Central Bank of Nigeria (CBN), the results emphasize the need to strengthen supervisory mechanisms that promote prudent risk-taking and effective provisioning. The evidence supports the design of financial sector reforms that enhance credit infrastructure, streamline loan recovery, and foster responsible lending practices.

The study is particularly relevant in the context of rising global financial uncertainties, including those linked to climate risk, digital transformation, and geopolitical tensions. As banks face these evolving challenges, the research underscores the urgency of adopting integrated risk management strategies aligned with international standards to enhance institutional resilience. Ultimately, reinforcing credit risk management in Nigerian commercial banks is essential not only for improving profitability but also for ensuring long-term financial stability and fostering inclusive economic growth (World Bank, 2024; IMF, 2023).

2. LITERATURE REVIEW

A key area of focus in the literature is the impact of specific credit risk mitigation practices, such as loan loss provisioning, borrower screening, and post-loan monitoring, on bank performance. Okoye et al. (2019) documented increased Earnings Per Share (EPS) among Nigerian banks practicing effective credit risk management, pointing to a direct relationship between risk control and shareholder value. Davydenko et al. (2020) stressed that regulatory frameworks only succeed when coupled with rigorous enforcement and ongoing supervision, especially in contexts marked by institutional fragility. Aworinde and Adegboye (2020) underscored the value of timely recovery strategies during economic turbulence as a tool for preserving financial performance.

Akanbi et al. (2021) reported that high default rates significantly impair bank profitability due to the resource burden of covering impaired loans. Salami et al. (2021) revealed that fluctuations in oil prices and currency depreciation intensify credit risk, thereby weakening bank earnings. Ijaiya et al. (2021) acknowledged the Central Bank of Nigeria's efforts in enforcing capital adequacy and provisioning regulations, which have yielded improvements in credit risk outcomes, albeit with challenges in consistent implementation. Ewah and Okpala (2012) found that rising levels of non-performing loans (NPLs) necessitate increased provisioning, which erodes net earnings. Beck et al. (2013) argued that banks with robust borrower vetting and monitoring systems are more capable of curbing defaults and sustaining profitability. Alhassan's (2014) analysis of Ghanaian banks concluded that thorough credit appraisals and ongoing borrower oversight significantly enhance financial returns.

Nwankwo (2015) noted that macroeconomic factors intensify credit risk exposure among Nigerian banks, highlighting the need for credit models that account for such systemic volatility. Akinlo and Adejare (2016) observed that institutions with effective portfolio risk management frameworks displayed greater resilience during economic contractions, thereby maintaining profitability. Ogunleye (2017) reinforced this view, finding that banks with sound credit governance systems reported higher Return on Assets (ROA) and Return on Equity (ROE) due to their minimized default exposure.

Udom and Edogbanya (2021) observed that while Nigerian banks have adopted various risk controls, many remain inadequately enforced or fail to address external disruptions such as political instability or global recessions. Jamil et al. (2022) emphasized that liquidity management plays a crucial role in moderating the adverse effects of overexposure to credit risk. In Pakistan, Mahmood et al. (2023) found that while liquidity supports profitability, aggressive lending, insufficient capital buffers, and escalating NPLs undermine long-term financial performance. Singh and Gupta (2024) drew attention to the increasing adoption of predictive analytics and real-time data tools to refine risk-return assessments, enabling banks to respond swiftly to market volatility.

Williams and Johnson (2024) interpreted this trend as indicative of a broader global shift toward flexible, data-driven credit strategies. Echoing this, Adamu and Garba (2024) argued that a resilient risk management infrastructure is essential for aligning capital adequacy with sustainable banking performance. Khan et al. (2023) argued that prudent and balanced risk-taking is vital for sustaining profitability in the face of default risks and credit expansion. Mulugeta (2023), studying Ethiopia, identified NPLs as a persistent drag on bank performance. In a similar vein, Natufe and Evbayiro-Osagie (2023) pinpointed capital adequacy, risk

asset ratios, NPLs, and bank size as key determinants of ROE, cautioning against the risks associated with excessive offshore borrowing.

Odume et al. (2023) noted that although capital adequacy can positively influence stability, its impact on Return on Capital Employed (ROCE) may be negative if not complemented by effective internal governance and experienced risk management personnel. Tshanda and Moyo (2023) highlighted the systemic risk posed by high NPL ratios across Sub-Saharan African banks, affirming their central role in profitability analysis. Imeh et al. (2025) provided strong empirical support for the view that efficient credit risk management significantly boosts profitability among listed banks, particularly when such frameworks are strategically implemented. Adamu and Garba (2024) emphasized the necessity of skilled credit risk professionals and real-time monitoring systems to enhance capital utilization and reduce loan defaults. Legass and Roba (2024), based on a decade-long dataset from Ethiopian banks, found that while credit interest income and loan ratios enhance profitability, NPLs continue to exert a detrimental influence.

3. METHODS

This research employs a quantitative approach, utilizing panel data analysis to assess the effect of credit risk management on the profitability of commercial banks in Nigeria. The chosen design is well-suited to the study's aim, as it facilitates the examination of numerical financial metrics across time and institutions, allowing for the identification of general patterns and potential causal relationships. The methodology integrates descriptive statistics, correlation analysis, and econometric modeling to evaluate the direction, strength, and intensity of the relationships between key credit risk indicators and profitability measures.

The study focuses on all commercial banks listed on the Nigerian Exchange Group (NGX) as of December 2024. A purposive sampling strategy is adopted to select banks with complete and consistent financial records covering the period from 2015 to 2024. This ten-year span captures significant macroeconomic developments, including regulatory reforms, post-COVID-19 economic recovery, and persistent inflation, enhancing the data temporal validity and relevance.

Secondary data constitute the primary source of information, derived from audited annual reports of the sampled banks, the Central Bank of Nigeria (CBN) Statistical Bulletin, and publications from the Nigerian Deposit Insurance Corporation (NDIC). Bank profitability, the dependent variable, is represented by three indicators: Return on Assets (ROA), Return on Equity (ROE), and Earnings Per Share (EPS). The key independent variables reflecting credit risk management include the Non-Performing Loan ratio (NPL), Capital Adequacy Ratio (CAR), Loan-to-Deposit Ratio (LDR), and Loan Impairment Charges (LIC). To address potential omitted variable bias and account for external economic influences, the study includes control variables such as Bank Size (BSIZE), Inflation Rate (INF), and Interest Rate (INT).

The analysis exploit both cross-sectional and time-series dimensions of the dataset. The main econometric model is specified as:

$$\text{Profitability}_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 CAR_{it} + \beta_3 LDR_{it} + \beta_4 LIC_{it} + \beta_5 BSIZE_{it} + \beta 6\ INF_t + \beta_7 INT_t + \varepsilon_{it}$$

$\text{Profitability}_{it}$ = ROA, ROE, or EPS of bank i at time t, α = constant term, β_1-β_7 = coefficients to be estimated, ε_{it} = error term, i = individual bank, and t = year (2015-2024).

The empirical model is estimated using both Fixed Effects (FE) and Random Effects (RE) techniques to address unobserved heterogeneity across banks. To determine the more suitable estimator, the Hausman specification test is employed, which evaluates whether the individual-specific effects are correlated with the explanatory variables. The null hypothesis (H_0) posits that the RE model is appropriate, while the alternative hypothesis (H_1) supports the FE model.

To ensure the robustness and credibility of the findings, a series of diagnostic checks are conducted. Multicollinearity among the explanatory variables is assessed using the Variance Inflation Factor (VIF), with a threshold of 10 applied to detect potential issues. The presence of heteroskedasticity is evaluated through the Breusch-Pagan/Cook-Weisberg test, while autocorrelation is tested using both the Durbin-Watson statistic and the Wooldridge test for serial correlation in panel data.

4. RESULTS

Table 1 presents a detailed examination of the relationship between credit risk management variables and bank profitability, as measured by Return on Assets (ROA). Across the three estimation techniques, the coefficient for Non-Performing Loans (NPLs) is

Table 1: Panel regression results – credit risk management and bank profitability

Variables	Model 1: ROA	Model 2: ROE	Model 3: EPS
Non-Performing Loans (NPL)	−0.142***	−0.378***	−0.265**
	(0.035)	(0.092)	(0.117)
Capital Adequacy Ratio (CAR)	0.064**	0.108**	0.089*
	(0.029)	(0.053)	(0.046)
Loan-to-Deposit Ratio (LDR)	0.021	0.045	0.037
	(0.019)	(0.041)	(0.036)
Loan Impairment Charges (LIC)	−0.112**	−0.231***	−0.198**
	(0.042)	(0.065)	(0.071)
Bank Size (log of total assets)	0.086***	0.117**	0.094**
	(0.024)	(0.048)	(0.039)
Inflation Rate (INF)	−0.032*	−0.065**	−0.057*
	(0.017)	(0.029)	(0.031)
Interest Rate (INT)	−0.019	−0.024	−0.021
	(0.012)	(0.017)	(0.015)
Constant	−0.457***	−1.128***	−0.843**
	(0.118)	(0.204)	(0.176)
Model Diagnostics			
R-squared	0.62	0.58	0.54
Hausman Test (p-value)	0.011	0.020	0.015
Model Type	Fixed Effects	Fixed Effects	Fixed Effects

consistently negative and statistically significant at the 1% level. This finding indicates that a higher incidence of NPLs significantly undermines bank profitability in Nigeria. The robustness of this result across models reinforces the validity of the negative link between asset quality deterioration and financial performance, consistent with previous studies (Akanbi et al., 2021).

The Capital Adequacy Ratio (CAR) exhibits a positive and statistically significant association with ROA in both the FE and RE models, suggesting that well-capitalized banks are more profitable. This likely reflects the role of capital buffers in absorbing financial shocks and enhancing investor and regulatory confidence. These findings support the theoretical framework underpinning Basel capital adequacy standards and are consistent with the empirical observations of Adamu and Garba (2024).

Loan Impairment Charges (LIC) are negatively and significantly related to ROA, implying that higher provisioning for potential loan losses erodes bank earnings. This result is theoretically sound, as LICs represent anticipated credit losses, which reduce net income. It highlights the importance of effective credit screening and monitoring mechanisms, in line with findings by Udom and Edogbanya (2021).

Bank Size is positively and significantly associated with ROA in all model specifications, suggesting that larger banks benefit from operational efficiencies, diversified revenue sources, and improved credit risk absorption capacity. This aligns with portfolio theory, which posits that diversification enhances financial stability and performance. Inflation exerts a negative and statistically significant influence on profitability, reflecting the adverse effect of price instability on interest margins and real asset values. Interest Rates, however, do not demonstrate a significant relationship with ROA. This insignificance may be due to offsetting dynamics, higher rates may increase interest income but also raise default risk, neutralizing their net effect on profitability.

The Hausman test result supports the Fixed Effects model, indicating that unobserved bank-specific characteristics are correlated with the regressors, thereby making FE the appropriate estimator. Collectively, the results in Table 1 underscore the central role of sound credit risk management practices in sustaining profitability in the Nigerian banking sector.

Table 2 extends the analysis by incorporating interaction terms and estimating the model using Generalized Least Squares (GLS) to check the robustness of the results under alternative assumptions. The key findings from the baseline models persist: NPLs continue to show a strong negative and highly significant effect on ROA. Notably, the interaction between NPLs and Inflation yields a negative and statistically significant coefficient, suggesting that the negative impact of NPLs on profitability intensifies during periods of rising inflation. This interaction effect supports macroprudential theories that argue inflation erodes the real value of loan repayments and undermines borrowers' capacity to service debt, thus aggravating credit risk. This result corroborates the arguments of Nwankwo (2015) and Salami et al. (2021), who advocate incorporating macroeconomic variables into credit risk assessment frameworks.

Table 2: Robustness check – interaction effects and alternative specifications

Variables	Model 4: ROA with interaction	Model 5: ROA GLS random effects
Non-Performing Loans (NPL)	−0.156***	−0.142***
	(0.031)	(0.036)
Capital Adequacy Ratio (CAR)	0.059**	0.062**
	(0.028)	(0.030)
Loan Impairment Charges (LIC)	−0.103**	−0.117**
	(0.041)	(0.043)
Bank Size	0.078***	0.072***
	(0.023)	(0.024)
Inflation Rate (INF)	−0.029*	−0.031*
	(0.016)	(0.018)
NPL×Inflation (Interaction Term)	−0.044**	−0.038**
	(0.019)	(0.017)
Interest Rate (INT)	−0.013	−0.016
	(0.011)	(0.012)
Constant	−0.429***	−0.405***
	(0.112)	(0.118)
Model Diagnostics		
R-squared	0.64	0.58
Wald Chi-Square	82.19 (p<0.001)	79.43 (p<0.001)
Hausman Test (p-value)	0.010	

Standard errors in parentheses. ***P<0.01, **P<0.05, *P<0.10. Source: Author (2025)

CAR and LIC coefficients remain statistically significant and directionally consistent with those in Table 1, reinforcing their robustness as explanatory variables. Similarly, Bank Size continues to exhibit a positive and significant effect on profitability, validating its importance in risk management and operational scalability. While the standalone effect of Inflation remains negative, its significance declines slightly after introducing the interaction term, indicating a partial mediation by NPLs. Interest Rate remains statistically insignificant, suggesting limited direct influence on profitability within the Nigerian banking context.

Model diagnostics reveal improved performance following the inclusion of the interaction term. R-squared value increases to 0.64, and the Wald test is highly significant, confirming the overall explanatory power of the model. The GLS estimation results mirror those from the FE and RE models, lending further credence to the reliability of the findings across different estimation techniques. These results collectively underscore the pivotal role of credit risk management in shaping profitability outcomes, particularly under macroeconomic stress conditions.

4.1. Policy Implications

The findings of this study underscore several critical areas where regulatory reform and institutional strengthening can enhance credit risk management and, by extension, bank profitability in Nigeria and other emerging economies. The persistent negative effect of non-performing loans (NPLs) on profitability highlights the urgent need for tighter regulatory oversight of lending practices. As Legass and Roba (2024) emphasize, elevated NPLs erode interest income and necessitate higher loan-loss provisions, undermining overall earnings. Consequently, the Central Bank of

Nigeria (CBN) should enforce stricter standards for loan appraisal and post-disbursement monitoring, utilizing advanced, data-driven assessment models in line with the recommendations of Singh and Gupta (2024) and Adamu and Garba (2024).

The positive association between capital adequacy and profitability, supported by Imeh et al. (2025) and Natufe and Evbayiro-Osagie (2023), though tempered by findings from Odume et al. (2023), calls for a more flexible approach to capital regulation. While maintaining minimum capital requirements remains essential, regulators should introduce countercyclical capital buffers, particularly during periods of heightened economic uncertainty. This approach aligns with Basel III standards and would help mitigate the risks of excessive credit expansion during economic upturns, as argued by Khan et al. (2023) and Williams and Johnson (2024).

Inflation's compounding effect on credit risk, as identified in this study and previously noted by Salami et al. (2021) and Nwankwo (2015), highlights the need for improved macro-financial policy coordination. Regulators should integrate inflation forecasts and other macroeconomic indicators into banks' stress testing and credit evaluation procedures, ensuring greater alignment between monetary policy and credit risk supervision (Davydenko et al., 2020; Mahmood et al., 2023).

The observed negative influence of loan impairment charges on profitability further underscores the necessity of adopting forward-looking provisioning standards. Regulatory bodies should institutionalize the application of Expected Credit Loss (ECL) models, as mandated by IFRS 9, to ensure that banks anticipate and provision for credit risk more proactively. This aligns with global best practices advocated by Singh and Gupta (2024) and Ewah and Okpala (2012), enhancing the accuracy and timeliness of loan-loss reserves.

The study also confirms that larger banks tend to perform better, likely due to scale efficiencies, risk diversification, and stronger internal capacities, as supported by findings from Ogunleye (2017), Okoye et al. (2019), and Tshanda and Moyo (2023). Regulatory support for strategic mergers and acquisitions could strengthen bank capitalization and operational resilience, particularly for Nigeria's tier-2 institutions, which are more vulnerable to sectoral shocks due to their concentrated loan portfolios (Aworinde and Adegboye, 2020).

Institutional governance must also be reinforced. As observed by Ijaiya et al. (2021) and Udom and Edogbanya (2021), many banks implement formal risk frameworks without sufficient technical expertise or oversight. To address this, regulators should require that bank risk committees be composed of qualified and experienced professionals, and that they be held accountable for failures in internal controls. Regular supervisory audits and strict adherence to corporate governance codes are essential to aligning internal risk cultures with regulatory expectations.

The adoption of advanced digital credit risk tools is increasingly imperative. Following global trends (e.g., Capital One, 2025; Jamil et al., 2022), Nigerian banks should transition from traditional credit scoring systems to real-time, predictive analytics that incorporate behavioral and macroeconomic indicators. Such systems would improve early-warning capabilities and reduce the likelihood of defaults.

Lastly, given the significant interaction between macroeconomic conditions, such as inflation and interest rate volatility, and credit risk indicators, regulatory models must evolve to incorporate these dynamics. As highlighted by Beck et al. (2013) and Adamu and Garba (2024), a more adaptive regulatory framework would enhance institutional resilience and enable banks to maintain stable performance even during economic disruptions. This forward-looking, integrated approach is crucial for ensuring the long-term sustainability of Nigeria's banking sector and strengthening its contribution to inclusive economic development.

5. CONCLUSIONS

The relationship between credit risk management and bank profitability remains a pivotal area of focus, particularly in emerging economies like Nigeria, where financial institutions play a central role in capital allocation and economic development. This study provides robust empirical evidence that sound credit risk management significantly enhances bank performance. Core determinants, such as capital adequacy, non-performing loans (NPLs), liquidity management, and risk-weighted asset ratios, are shown to influence profitability outcomes directly. Nonetheless, systemic vulnerabilities persist, including excessive dependence on offshore borrowing and inadequate implementation of risk management frameworks, which continue to compromise financial stability amid economic volatility.

The analysis confirms that banks equipped with structured credit risk systems, encompassing rigorous loan assessment procedures, diligent borrower monitoring, and timely loan recovery, tend to perform better financially. However, the recurring issue of elevated NPLs, both in Nigeria and across the Sub-Saharan banking landscape, signals the need for more strategic and anticipatory approaches to credit exposure. Furthermore, while existing regulatory mechanisms, such as those issued by the Central Bank of Nigeria on capital adequacy, have yielded some benefits, their efficacy is often diminished by inconsistent enforcement and institutional weaknesses.

Some recommendations are offered to improve credit risk management and boost profitability in Nigerian banks. First, excessive offshore financing exposes banks to exchange rate volatility and global credit shocks. Nigerian banks should pursue a more balanced funding structure, increasing reliance on domestic capital markets to promote long-term operational resilience (Natufe and Evbayiro-Osagie, 2023). Second, regulatory authorities, particularly the CBN, must prioritize uniform enforcement of credit risk guidelines. Strengthening supervisory institutions and enforcing compliance with capital adequacy and provisioning standards are critical steps toward mitigating systemic financial risks (Davydenko et al., 2020). Third, banks should enhance their credit evaluation and oversight frameworks by integrating comprehensive pre-lending assessments, post-disbursement

monitoring, and early warning systems. The adoption of real-time data analytics and predictive modelling can significantly improve risk anticipation and decision-making processes. Fourth, to reduce exposure to sector-specific vulnerabilities, banks should pursue greater diversification of their loan portfolios across industries and client segments. This approach minimizes the adverse effects of concentrated lending, particularly in high-risk sectors like oil, agriculture, and real estate (Cebenoyan and Strahan, 2004). Fifth, enhancing credit appraisal capabilities with advanced risk assessment tools, including both quantitative models and qualitative judgment, will support more informed lending practices and reduce the likelihood of loan defaults (Udom and Edogbanya, 2021).

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