

Effect of Non-Performing Loans on the Profitability of Selected Development Finance Banks in Nigeria

Rasaq Ozemedede Ayaghena, Faiza Haruna Maitala, OcheDomi David Ekele,
Catherine Niyi-Afolabi

Department of Business Administration, Nile University of Nigeria Abuja

doi: <https://doi.org/10.37745/ejafr.2013/vol14n64972>

Published August 18, 2026

Citation: Ayaghena R.O., Maitala F.H., Ekele O.D., Niyi-Afolabi C. (2026) Effect of Non-Performing Loans on the Profitability of Selected Development Finance Banks in Nigeria, *European Journal of Accounting, Auditing and Finance Research*, 14(6),49-72

Abstract: *This study looked at the effects of bad loans on the profits of development finance banks in Nigeria. The research used data from five major development banks including Bank of Industry, Nigerian Export-Import Bank, Nigerian Agricultural Cooperative Bank, Infrastructure Bank Nigeria, and Development Bank of Nigeria over a 15-year period from 2010 to 2024. The main goal was to find out if non-performing loans, loan loss provisions, interest income reduction, and loan concentration risk have any real effect on bank profitability measured by return on equity. The results showed that these development banks maintained steady but low profitability during the study period, with an average return on equity of 2.10% and ranging from 1.6% to 2.7%. Non-performing loans averaged 4.42% of regulatory capital across all banks, while loan loss provisions averaged 1.19% of total loans. The correlation analysis revealed strong negative relationships between profitability and both loan loss provisions (-0.907) and non-performing loans (-0.887). However, when the study used the more reliable fixed effects model, the results changed significantly. The Hausman test with a chi-square value of 99.334 and p-value of 0.000 confirmed that the fixed effects approach was the best method to use for this analysis. The study found that only loan concentration risk had a significant effect on return on equity (ROE) under the fixed effects model, with a positive coefficient of 0.008 and p-value of 0.010. This means that when banks focus their lending on certain areas, their profits go up slightly. This study concludes that loan loss provision, non-performing loans, interest income reduction, and loan concentration risk impact the return on equity (ROE) of Nigerian development finance banks. It suggests that individual bank management practices significantly influence these risks' impact on profitability. Non-performing loans to regulatory capital have a significant negative effect on ROE, while interest income reduction rates vary among banks. Based on the conclusions, the study recommends that banks create tailored plans for loan losses, regularly adjust risk and profit plans, and establish strong systems to control bad loans. It also suggests exploring alternative income sources, such as new products, technology, and staff training, and focusing on specific sectors for better profits and risk control.*

Keywords: non-performing loans, loan loss provisions, interest income reduction, loan concentration risk, bank profitability, return on equity.

INTRODUCTION

Non-performing loans (NPLs) represent a critical juncture in the financial ecosystem, directly influencing the profitability, stability, and long-term sustainability of banks. For Development Finance Banks in Nigeria, tasked with fostering socio-economic growth through targeted funding, the challenges of NPLs are particularly acute. These loans, defaulted or near-default, drain financial resources, disrupt liquidity, and hinder operational efficiency. Toxic assets have historically been held by Nigerian banks in substantial amounts that have increased year in-year out and have not been reduced by proper credit risk management. For instance, consider the years 1994 and 2000, when 33 banks in Nigeria were dissolved. Due to this, there are now more than 200-billion-naira worth of non-performing loans (NPL). They erode the profitability of banks by reducing interest income and increasing provisioning costs, making effective management imperative.

In the Nigerian context, the role of Loan Loss Provisions (LLPs) is particularly crucial. LLPs are financial reserves set aside to cover potential losses from defaulted loans. While these provisions are essential for managing credit risk, excessive provisioning can undermine a bank's profitability by reducing net earnings. Recent studies in Indonesia highlight that high LLP ratios often signal poor loan management practices, thereby reducing the bank's operational efficiency (Gunawan & Maimunah, 2022). Similar observations have been noted in Bangladesh, where aggressive provisioning practices have negatively impacted ROE (Karim et al., 2023).

While global research provides valuable insights, the unique challenges of Nigeria's financial environment necessitate a localised focus. Factors such as inflation, exchange rate volatility, and regulatory gaps exacerbate credit risks, making NPL management even more critical. This study seeks to bridge the research gap by exploring the specific effect of Loan Loss Provisions, NPLs to Regulatory Capital, Interest Income Reduction Rates, and Loan Concentration Risk on the profitability of Nigerian Development Finance Banks. By leveraging financial data and advanced analytical techniques, this research aims to provide actionable recommendations for policymakers, banking professionals, and scholars, contributing to the broader discourse on financial stability and economic growth.

Statement of the Problem

Despite extensive global research on the impact of NPLs on profitability, there is a notable gap in actionable, practice-oriented strategies tailored to the specific needs of development finance banks. Most existing studies emphasized theoretical frameworks and high-level recommendations, often overlooking the granular challenges that banks face in operationalizing these solutions (Gunawan & Maimunah, 2022) and (Handayani et al., 2024).

However, while studies in Indonesia have highlighted the importance of robust pre-loan evaluation processes and post-loan monitoring to reduce NPL levels (Wijaya et al., 2023), Nigerian banks

continue to face systemic inefficiencies that impede the adoption of such measures. The lack of practical guidelines for integrating advanced risk management tools such as data analytics and predictive modelling limits their effectiveness in Nigerian banks.

Moreover, the application of proxies like the Interest Income Reduction Rate and Loan Concentration Risk in global contexts has been extensively documented (Karim et al., 2023), but these insights lack translation into practice within the operational realities of Nigeria. Many Nigerian banks lack the technological infrastructure and expertise to implement data-driven solutions for managing these proxies, further widening the gap between theory and practice (Parvin et al., 2023; Dahal et al., 2024). The management of low credit risk and the need for both internal and external monitoring restrict stability and profitability of banks, according to information obtained about the Nigerian banking system (Obi, 2012). Non-performing loans (NPLs) according to (Nweze, 2012), which are the outcome of inadequate credit risk management, are one of Nigeria's most important indicators of bank defaults.

This study seeks to bridge the contextual and practical gaps by investigating the specific effect of Loan Loss Provisions to Total Loans, Non-Performing Loans to Regulatory Capital, Interest Income Reduction Rates, and Loan Concentration Risk on the profitability of Development Finance Banks in Nigeria. By aligning global best practices with local realities, the research aims to provide actionable insights for policymakers and banking practitioners, ultimately enhancing operational efficiency and financial performance.

LITERATURE REVIEW

Non-Performing Loans (NPLs)

Non-Performing Loans (NPLs) are at the core of banking risk management and financial stability. They represent loans for which borrowers have failed to meet repayment obligations within a specified period, often beyond 90 days. NPLs are critical indicators of credit risk and financial health, reflecting a bank's exposure to loan defaults and the efficacy of its credit risk management practices. NPLs directly influence a bank's liquidity, profitability, and operational stability (Silvia et al., 2024; Karim et al., 2023).

The impact of NPLs on profitability is significant as rising NPL levels increase loan loss provisions, reduce interest income, and escalate operational costs. These effects cascade through the financial system, undermining solvency and eroding shareholder value (Handayani et al., 2024; Diakomihalis & Economakou, 2023). NPLs are also symptomatic of broader macroeconomic and regulatory challenges, including inflation, exchange rate volatility, and weak legal frameworks, which exacerbate credit risks (Wijaya et al., 2023; Cahyani & Amirudin, 2024).

Globally, research underscores the negative correlation between NPLs and profitability. For instance, studies on Indonesian and Nepalese banks reveal that high NPL ratios significantly reduce Return on Assets (ROA) and Return on Equity (ROE), emphasizing the need for stringent

credit risk management strategies (Shrestha & Khadka, 2024; Panta, 2018). In Nigeria, where economic instability and regulatory gaps prevail, managing NPLs remains a persistent challenge, requiring banks to adopt Protective measures to mitigate defaults and improve asset quality (Buchory, 2024; Rokhmat et al., 2023).

NPLs also disrupt interest income generation, a primary revenue source for banks. The decline in revenue from interest-bearing assets due to NPLs is evident in several contexts, including commercial banks in Greece and Vietnam, where high default rates have significantly constrained profitability (Do et al., 2020; Mohammed & Fatih, 2022). This underscores the importance of maintaining healthy loan portfolios to sustain operational efficiency and financial stability.

Additionally, the relationship between NPLs and regulatory capital highlights systemic vulnerabilities. Elevated NPL levels increase the strain on regulatory capital, reducing a bank's ability to absorb losses and comply with regulatory requirements. This has been observed in studies across Saudi Arabia and Indonesia, where high NPL ratios negatively impacted banks' solvency and overall performance (Al Zyood, 2022; Gunawan & Maimunah, 2022). Loan concentration risk, often linked with NPLs, further exacerbates financial vulnerabilities. Overexposure to specific sectors or borrower groups heightens the risk of default during sectoral downturns, as demonstrated in research on joint venture banks in Nepal (Panta, 2018) and Islamic commercial banks in Indonesia (Renfiana & Azizah, 2022). Diversification of loan portfolios is therefore essential for mitigating concentration risks and reducing the likelihood of systemic shocks.

In the Nigerian context, addressing NPLs requires a multifaceted approach that combines regulatory reforms, advanced credit assessment tools, and proactive loan recovery mechanisms. Effective NPL management strategies not only enhance profitability but also contribute to economic resilience by ensuring that banks remain stable, competitive, and capable of supporting national development objectives (Handayani et al., 2024; Cahyani & Amirudin, 2024; Karim et al., 2023).

Profitability

Profitability measures the organization's monetary wellbeing and viability of the company in using the assets to produce income from the business (Fatihudin & Mochklas, 2018). Profitability has received significant attention from researchers, especially in accounting and strategic management. The reason for this is not far-fetched as profitability has implications for organization's health and long-term survival.

According to Ibrahim (2015), financial performance is the efficient and effective use of resources by an organization for the accomplishment of its objectives resulting in an increase in share price, sales, market share, profitability, earnings, and cash flows and meeting the expectations of its various stakeholders. Oyedokun et al. (2017) defined performance as a situation when corporate entities can generate enough revenue that is above the costs of production. Afrifa and Tauringana (2015) view financial performance as a company's capacity to reduce operating costs, maximize

asset use, and increase shareholder value. They further view high performance as a demonstration of the effectiveness and efficiency of management in using a company's resources, which in turn relates to the economy.

Profitability is a pivotal construct in this study, serving as the dependent variable that encapsulates the operational and Performance outcomes influenced by the management of Non-Performing Loans (NPLs). It provides a quantitative assessment of a bank's ability to generate revenue, manage expenses, and sustain operations while maintaining competitiveness and financial resilience. Conceptually, financial performance connects the effectiveness of NPL management strategies to broader organisational objectives, including profitability, growth, and long-term sustainability (Silvia et al., 2024; Shrestha & Khadka, 2024).

Key metrics such as Return on Assets (ROA), Return on Equity (ROE), Return on Investment (ROI) and efficiency ratios are commonly used to evaluate financial performance. ROA measures how efficiently a bank utilises its assets to generate profits, providing insights into operational efficiency and resource allocation. Return on Investment (ROI) is a financial metric that calculates the return or profit an investment generates in relation to its cost.

Return on Equity (ROE), on the other hand, indicates the profitability relative to shareholders' equity, reflecting the institution's ability to deliver returns on investments. Efficiency ratios, such as the cost-to-income ratio, assess the balance between expenses and revenues, offering a holistic view of financial health and operational stability (Handayani et al., 2024; Rokhmat et al., 2023). In Nigeria, financial performance is particularly influenced by macroeconomic conditions, regulatory environments, and systemic challenges such as high inflation, currency volatility, and limited credit market depth. These factors exacerbate the financial strain caused by high NPL levels, impacting the bank's ability to achieve profitability and maintain operational efficiency. Despite these challenges, Nigerian banks that implement robust NPL management strategies often outperform their peers in terms of Return on E and efficiency metrics, highlighting the critical role of strategic credit risk management (Cahyani & Amirudin, 2024; Silvia et al., 2024).

Financial performance also serves as a key indicator for stakeholders, including investors, regulators, and policymakers, offering insights into a bank's stability, competitiveness, and growth potential. High performance levels signal effective resource allocation, risk mitigation, and operational efficiency, while poor performance may indicate systemic vulnerabilities or inefficiencies in loan management practices. By focusing on these metrics, banks can align their operational strategies with organisational goals and industry benchmarks (Rusli & Fitriana, 2023; Rokhmat et al., 2023).

Return on Equity

The net ratio of ordinary equity measures the rate of return on ordinary shareholder investment. This Return on Equity Ratio shows the efficient use of own capital. If this ratio is higher, the better. It is a measure of financial performance calculated by dividing net income by shareholders' equity

Nurhikmawaty et al (2020) Return on Equity (ROE) is a ratio that shows the extent to which a company manages its own capital appropriately and measures the level of return on capital that has been invested by investors (Yaslim & Masdupi, 2020). Based on the above statement, it can be interpreted that if the Return on Equity has a low value, it indicates and illustrates that the company is not doing well. ROE is a tool used to assess the ability of capital itself to generate profits for all shareholders, both common stock and preferred stock. Also, (Imoter & Dugugh, 2018) explained Return on Equity (ROE) as an accounting indicator of value creation and measures the profitability of equity invested in the business, it shows the profit per unit of capital invested.

Return on Equity as a financial performance ratio is a very important indicator for investors. ROE is needed by investors to measure the company's ability to obtain net income related to dividends (Pohan, 2020). The choice of ROE as a proxy for financial performance is because a higher ROE shows that the company is more efficient in using its own capital to generate investment income. The amount of ROE is strongly influenced by the amount of profit the company receives, the higher the profit, the higher the ROE. ROE is the ratio between profit after tax to total equity (equity) that comes from owner's deposit, profit is not shared with other reserves owned by the company (Pohan, 2020). Likewise, Segun et al, (2021) construed that return on equity is a financial ratio that commonly used to measure the level of profits of a company by comparing the net profit after tax with total own capital. This ratio is used to measure the level of return on capital of each investment made in a company through the purchase of stock portfolio purchases.

Conceptual Framework

The conceptual framework for this study integrates the interplay between Non-Performing Loan (NPL) proxies and profitability within the context of development finance banks in Nigeria. It is structured around four key proxies Loan Loss Provision to Total Loans, Non-Performing Loans to Regulatory Capital, Interest Income Reduction Rate, and Loan Concentration Risk which are used to evaluate the impact of NPLs on bank profitability. Conceptual framework was formulated carefully by the researcher from the various Literature reviewed. This framework will guide the research throughout as presented in figure 1 below.

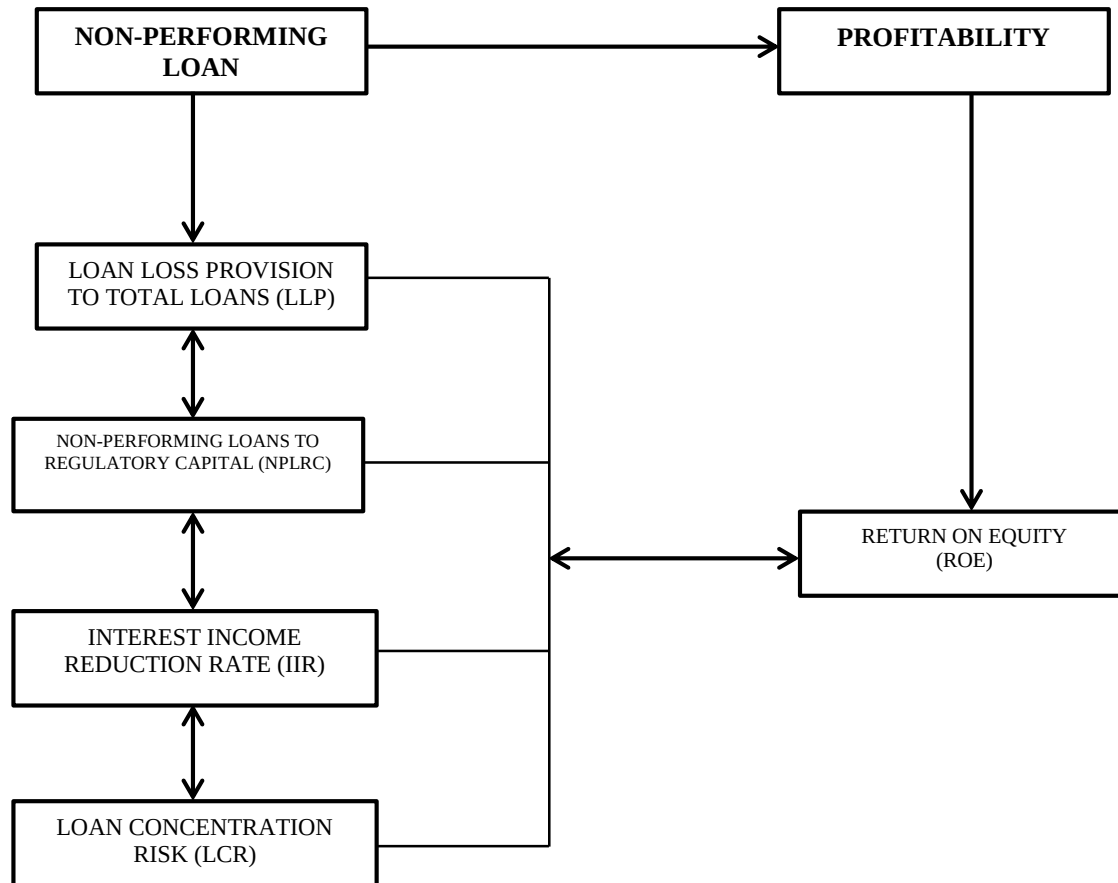


Figure 1 Conceptual Framework
Source: Authors Compilation (2025)

Theoretical Review

This study adopts Risk-Return Theory to provide a robust theoretical underpinning for exploring the relationship between Non-Performing Loans (NPLs) and the profitability of development finance banks. Risk-Return Theory is particularly suited to this study due to its strong relevance to the dynamics of risk management and profitability optimization in the banking sector.

Risk-Return Theory, introduced by Markowitz (1952) and further refined by Sharpe (1964), posits that higher risks are associated with the potential for higher returns. This principle is central to understanding how banks' balance credit risk and profitability in their lending practices. For development finance banks, which often operate in high-risk environments such as Nigeria, the theory offers critical insights into how risk-adjusted strategies impact financial performance. Lending rates and NPL proxies, such as Loan Loss Provision to Total Loans (LLP), Non-Performing Loans to Regulatory Capital (NPLRC), and Interest Income Reduction Rate (IIR),

serve as compensation mechanisms for risks arising from borrower defaults, economic instability, and systemic inefficiencies (Sharpe, 1964; Shrestha & Khadka, 2024).

The application of Risk-Return Theory in this study is justified by the prevalence of macroeconomic challenges in Nigeria, including inflationary pressures, currency instability, and weak regulatory frameworks. These factors amplify credit risks, making it essential for banks to evaluate risk-return trade-offs in their NPL management strategies. High LLP ratios, while mitigating potential losses, reduce net earnings, highlighting the need for balanced risk management approaches. Similarly, a high NPLRC ratio signals that a significant proportion of regulatory capital is tied up in unproductive assets, undermining profitability and solvency (Silvia et al., 2024; Rokhmat et al., 2023).

This study leverages Risk-Return Theory to analyse how NPL proxies LLP, NPLRC, IIR, and Loan Concentration Risk (LCR) impact the profitability of development finance banks. By examining these relationships, the research aims to provide actionable insights into how Nigerian banks can optimise their credit risk management practices to balance profitability with systemic stability. This theoretical approach ensures that the study contributes meaningfully to the broader discourse on financial performance in resource-constrained environments.

Risk-Return Theory provides the analytical lens for contextualising the relationship between NPLs and financial performance. By framing NPL management as a function of risk-adjusted returns, the study captures the complexities of credit risk mitigation and profitability optimization, offering both theoretical and practical contributions to the field of banking and financial management.

Empirical Review

Several studies found a positive and significant correlation between attributes indicators and Bank profitability, whereas other studies found a negative and insignificant correlation. In the first section of the review, studies that found a connection between Non-Performing Loans characteristics and Banks profitability would be discussed; in the second, studies that found a connection between NPL characteristics and Bank financial performance but with mixed results or no connection at all would be discussed.

Dahal et al. (2024) examined how NPL ratios influence profitability in Nepal's development banks. Analysing data from eight banks over a six-year period, the study found that NPLs reduced Return on Equity (ROE) by 10% annually, with significant effect on interest income and loan recovery. Using panel regression models, the research highlighted that weak credit policies were the primary contributors to rising NPLs. The study offers insights into risk management but focuses heavily on Nepalese institutions, necessitating caution when generalizing results to Nigerian banks. The findings stress the importance of robust loan approval mechanisms in managing default risks.

Shrestha and Khadka (2024) evaluated the effects of NPL ratios on profitability in 10 Nepalese commercial banks between 2016 and 2022. The study used a balanced panel dataset to investigate the impact on key profitability measures such as Return on Equity (ROE). Results revealed a direct negative correlation, with ROE dropping by 12% during periods of elevated NPLs. The study underscores the need for targeted credit monitoring systems to mitigate losses. While it provides valuable evidence for developing economies, its relevance to Nigeria's banking sector is moderated by contextual differences in economic conditions and regulatory frameworks.

Buchory (2024) explored how cost of funds (CoF) and NPLs collectively impact profitability in regional development banks in Indonesia. Using a 10-year dataset from 12 banks, the study found that both CoF and NPLs significantly reduced profitability as measured by ROE and net interest margins. High CoF levels compounded the negative effects of NPLs, intensifying pressures on financial stability. The study emphasizes the importance of lowering funding costs and maintaining NPL levels below regulatory thresholds. Although based in Indonesia, the findings offer strategic insights for Nigerian banks in managing credit risks.

Shrestha and Khadka (2024) evaluated the effect of NPLs on the profitability of Nepalese commercial banks. Using data from 10 banks over seven years, the study applied multiple linear regression models to assess the relationship. Findings indicated that NPLs had a significant negative impact on profitability, measured by ROE. The study emphasizes the need for banks to reduce NPL levels to maintain financial performance and recommends proactive credit risk management strategies.

Lee et al. (2024) explored the interplay between economic cycles and NPL ratios in East Asian banks, focusing on their impact on profitability. The study used data from 45 banks between 2005 and 2022, employing dynamic panel models to measure the cyclical nature of loan defaults. Findings showed that economic downturns significantly increase NPL ratios, leading to a sharp decline in return on equity (ROE). The research emphasized the importance of countercyclical provisions and capital buffers in mitigating risks. While insightful, the study's regional focus necessitates caution when generalizing to contexts like Nigeria. The findings underscore the role of macroeconomic stability in sustaining banking profitability.

Okoro et al. (2024) explored the moderating role of corporate governance on NPL-related profitability challenges in Nigerian banks. Using a dataset from 15 banks between 2016 and 2022, the study applied structural equation modelling (SEM) to analyse governance practices and their impact on profitability. Findings showed that strong governance frameworks significantly mitigate the negative effects of NPLs on financial performance. The authors emphasized the role of board oversight and regulatory compliance in achieving sustainable profitability. While insightful, the study did not explore the macroeconomic variables influencing NPL levels. These findings highlight the importance of governance in managing credit risks effectively.

Ali and Musa (2024) explored the relationship between NPL ratios and customer satisfaction in Pakistani banks. Using survey data from 15 banks between 2018 and 2022, the study applied correlation analysis to assess how poor loan performance effect customer retention and profitability. Results revealed that rising NPLs reduce customer confidence, leading to diminished profitability and reputational risks. The authors emphasized integrating customer feedback mechanisms into credit risk management practices. These findings provide a unique perspective on the interplay between operational performance and customer satisfaction.

Fernandez et al. (2024) studied the influence of climate-related risks on NPL levels in European banks. Using data from 30 banks between 2016 and 2023, the study employed panel regressions to link environmental risks with loan performance. Findings showed that banks with high exposure to carbon-intensive sectors experienced elevated NPL ratios. The authors recommended integrating climate risk assessments into loan appraisal processes to mitigate these challenges. Although focused on Europe, this study offers lessons for global banks, including those in Nigeria, on managing emerging risks.

Shrestha and Khadka (2024) evaluated the impact of NPLs on profitability in Nepalese commercial banks using data from 10 banks between 2016 and 2023. Employing multiple regression analysis, the study found a significant negative relationship between NPL ratios and return on assets (ROE). Findings suggested that effective loan recovery and prudent risk assessment could enhance profitability. The study emphasized that NPL levels substantially influence banks' operational outcomes, recommending lower NPL thresholds to optimize performance. These insights are crucial for emerging markets, although they focus on a limited regional scope.

Bhowmik and Sarker (2024) investigated the impact of NPLs on bank profitability across South Asian countries from 2011 to 2019. Using panel data, the study revealed that high NPL levels significantly hinder ROE. Findings stressed the critical role of macroeconomic stability in reducing default risks. The study recommended tailored credit policies to mitigate adverse effects in high-risk environments. While insightful, the regional focus may limit direct applicability to Nigerian banks.

Shkodra et al. (2024) explored the effects of NPLs on bank profitability in Western Balkan countries using data from 2010 to 2020. Findings revealed that high NPL levels significantly reduce ROE, underscoring the need for effective risk management. The study recommended proactive credit policies and enhanced regulatory oversight to reduce default risks. Insights emphasized the role of macroeconomic stability in improving financial outcomes. While region-specific, the study offers valuable lessons for banks globally.

Kelvin et al. (2024) analysed the impact of NPLs on profitability in Nigerian banks using data from 2010 to 2021. Results showed that high NPL levels negatively impact ROE, while effective credit restructuring policies mitigate adverse effects. The study recommended enhancing credit monitoring and implementing flexible repayment structures to improve outcomes. Findings

highlighted the critical need for regulatory support in managing loan defaults. These insights are particularly relevant for Nigeria's economic context.

Rusli and Fitriana (2023) investigated the impact of NPLs on profitability in Indonesian banks during the COVID-19 pandemic. Data from seven banks between 2019 and 2021 revealed that NPLs had no significant effect on ROE. Findings emphasized the importance of financial resilience during crises. Recommendations included enhancing loan recovery and implementing robust stress-testing frameworks. The study provides valuable insights into managing financial stability during economic disruptions.

Diakomihalis and Economakou (2023) investigated the relationship between non-performing loans (NPLs) and profitability in Greek banks. The study utilized financial data from 15 commercial banks between 2015 and 2022 to analyse the effects of overdue loans on key profitability metrics. Results indicated that NPLs over 90 days had a significant negative impact on net profit before tax, though interest income remained positive. This underscores the drag of unresolved bad debts on overall profitability. While the study highlights effective credit management's importance, its focus on Greek banks limits its direct applicability to Nigeria's unique economic and regulatory environment. Findings reinforce the need for development banks to manage credit risks proactively.

Diakomihalis and Economakou (2023) analysed the relationship between non-performing loans (NPLs) and profitability in Greek banks. The study used financial ratios from multiple banks to examine how overdue loans impact net profits and equity. Results revealed that loans overdue for more than 90 days significantly reduce net profit before tax, demonstrating the adverse effects of NPLs on profitability. The correlation between NPLs and return on assets (ROA) and return on equity (ROE) was not statistically significant, highlighting varying effect depending on financial metrics. This study underscores the importance of effective NPL management to maintain profitability in banks operating under economic strain.

Rokhmat et al. (2023) investigated the effects of deposits and NPLs on profitability in Indonesian commercial banks. Using unbalanced panel data from 41 banks, the study applied regression models to analyse the relationship. Findings indicated that while deposits alone had an insignificant effect, NPLs significantly and negatively influenced profitability. The study emphasizes that high NPL levels erode profitability by increasing operational costs and lowering return on assets. It highlights the need for stricter credit risk assessments and operational efficiency to mitigate the adverse effects of NPLs.

Kumar and Rao (2023) investigated the impact of NPLs on the operational efficiency of Indian public sector banks. Using data from 20 banks between 2010 and 2022, the study applied fixed-effects regression to assess how rising NPL levels reduce profitability by increasing loan provisioning costs. Results highlighted a significant inverse relationship between NPL ratios and return on assets (ROA), with inefficiencies exacerbating financial stress. The study recommended

strengthening credit appraisal processes and implementing advanced monitoring tools to minimize defaults. Findings revealed that efficient risk management could offset adverse effects on profitability, offering practical insights for similar banking environments. However, the research's focus on public sector banks limits its applicability to private or international institutions.

Chen et al. (2023) examined the relationship between loan portfolio diversification and NPL management in Chinese commercial banks. Using a dataset of 25 banks from 2012 to 2021, the study employed generalized method of moments (GMM) estimations to measure how diversification reduces credit risks. Results indicated that banks with diversified portfolios experienced fewer NPLs and improved profitability, as measured by ROE and net interest margins. The authors emphasized the importance of targeting multiple sectors to mitigate sector-specific risks. While focused on China, the findings offer valuable lessons for banks in other emerging markets with concentrated credit exposure. This study supports the strategic importance of portfolio diversification in managing NPL-related risks.

Ahmed and Bello (2023) assessed the impact of NPLs on profitability and liquidity in Nigerian deposit money banks. Using panel data from 12 banks between 2015 and 2022, the study found that high NPL levels significantly erode profitability by increasing liquidity pressures. The findings revealed that banks with efficient loan recovery processes exhibited better financial resilience during periods of economic instability. The authors recommended regulatory reforms to enhance loan monitoring and improve recovery rates. However, the study's limited sample size restricts the generalizability of its conclusions. These insights underscore the critical need for proactive NPL management strategies to sustain liquidity and profitability.

Ibrahim et al. (2023) analysed the determinants of NPL ratios in sub-Saharan African banks, focusing on macroeconomic and institutional factors. Using data from 25 banks across five countries between 2010 and 2020, the study applied random-effects models to identify key drivers. Results indicated that economic growth, inflation, and institutional quality significantly influence NPL levels. The study recommended enhancing macroeconomic policies and institutional frameworks to reduce credit risks. While region-specific, these findings are relevant for banks in Nigeria facing similar economic challenges. This research highlights the importance of aligning credit policies with macroeconomic realities.

Martins and Zhou (2023) examined the effects of regulatory capital requirements on NPL ratios and profitability in European banks. Using a panel dataset of 40 banks from 2015 to 2021, the study found that stringent capital requirements reduce NPL levels but also constrain profitability. Results emphasized the trade-offs between financial stability and operational efficiency. The authors recommended adopting balanced regulatory frameworks to optimize these outcomes. Although focused on European banks, the findings offer insights for Nigerian regulators seeking to enhance credit risk management.

Rokhmat et al. (2023) examined the effects of deposits and non-performing loans on bank profitability in Indonesia using panel data from 41 commercial banks from 2015 to 2021. Results revealed that NPLs have a significant negative impact on profitability, while deposits showed a non-significant effect. The study employed fixed-effects regression, highlighting the critical role of NPL management in sustaining financial performance. The findings emphasized that high NPL levels lead to liquidity stress and reduce operational efficiency. Recommendations include robust credit risk frameworks to mitigate NPL growth and maintain profitability. While insightful, the study's focus on Indonesia may limit its applicability to other markets.

Ahmed (2023) examined the relationship between non-performing assets (NPAs) and profitability at Cihan Bank in Iraq from 2017 to 2020. Results showed a significant negative relationship between NPAs and ROE, emphasizing that rising NPAs directly reduce profitability. The study recommended improving credit appraisal mechanisms and enhancing recovery rates to mitigate the adverse effects. Findings highlighted the critical need for effective NPL management in stabilizing financial outcomes. These insights are valuable for emerging markets, particularly in volatile economic environments.

Maher and Fatih (2022) analysed the impact of NPLs on profitability in Iraqi commercial banks using panel data from 2010 to 2020. Results indicated a strong negative correlation between NPL ratios and net income. The study emphasized the importance of macroeconomic stability in reducing credit risks. Recommendations included improving governance frameworks and adopting advanced monitoring tools to enhance profitability. Findings are relevant for emerging economies facing systemic financial challenges.

Ihemeje et al. (2022) investigated the effects of NPLs on profitability among deposit money banks in Nigeria. Using data from 15 banks and the Central Bank of Nigeria over an eight-year period, the study found that NPLs significantly reduced ROE and loan recovery rates. The authors highlighted the role of weak regulatory oversight and economic volatility in driving high NPL levels. The study suggests that targeted policies and credit management frameworks are critical to reversing profitability declines. Its context-specific findings make it particularly relevant to this research.

Al Zyood (2022) examined the influence of NPLs on the profitability of Saudi banks, focusing on ROA and ROE as dependent variables. Using a dataset spanning 2009–2017, the study employed regression analysis to evaluate the effects of NPL ratios. Results demonstrated a significant negative relationship between NPL ratios and profitability, underscoring the detrimental impact of defaults on banks' financial stability. The study calls for improved NPL management strategies to mitigate these negative outcomes.

Adnan and Syed (2022) analysed the effects of NPLs on credit allocation efficiency in Pakistani banks using data from 10 major banks between 2010 and 2021. The study applied time-series econometric techniques to establish that rising NPL ratios reduce lending capacity, ultimately

constraining profitability. Results demonstrated a significant negative correlation between NPL levels and loan growth rates, with banks prioritizing provisioning over credit expansion. The authors recommended policy interventions to support financial stability during periods of high default risk. While the research focused on Pakistan, its implications for similar emerging markets are substantial. This study highlights the importance of improving credit recovery mechanisms to sustain profitability.

Zyood (2022) analysed the effects of NPL ratios on the profitability of Saudi Arabian banks using data from 2009 to 2017. The study employed regression analysis to show that NPL ratios have a significant negative impact on ROE. Findings highlighted that rising NPL levels erode profitability by increasing provisioning costs and reducing interest income. The research recommended strengthening regulatory oversight and enhancing credit risk assessment. Despite the focus on Saudi Arabia, the study provides globally applicable insights into NPL management.

Gunawan and Maimunah (2022) explored the relationship between NPLs and profitability in Indonesian banks listed on the Indonesia Stock Exchange. Data analysis from 30 banks between 2018 and 2020 revealed a significant negative effect of NPLs on ROE. The study emphasized the need for robust risk management frameworks to curb loan defaults. Recommendations included adopting proactive loan monitoring and restructuring policies to sustain profitability. The findings align with global trends in NPL management but focus on Indonesia's unique financial dynamics.

Literature Gap

The empirical literature highlights numerous studies examining the impact of non-performing loans on financial performance (ROE). However, several gaps remain unexplored, which this study seeks to address. The conceptual theoretical and empirical evidence revealed a few literature gaps, which hopefully will be addressed by the current study, whilst literature on NPL characteristics and Bank Profitability remains mixed and has yielded inconclusive results. Specifically, because of the divergent results reported in literature, it becomes difficult to understand the effect of NPL attributes on Bank's Profitability.

Firstly, most of the studies in literature utilized annual financial statements as the source of secondary data (Naseem et al., 2017; Usman, 2018; Emeka-Nwokeii and Agubata; 2019; Akinwale and Ajide; 2020 etc.). However, it is unarguable that annual statements or annual reports are reliable sources of secondary data for assessing financial performance, however, quarterly, or monthly statements tend to provide more observations. Hence, this study would make use of quarterly statements to address the gap in source of data.

Secondly, prior studies have been limited in terms of methodological approach for stance, there were few studies that used cross-sectional research design. While the data analysis used in most of these studies were Regression, Correlation Analysis, Ratio Analysis as well as Descriptive Statistical Analysis. This study will adopt Panel (Cross-sectional) Auto Regressive Distributed

Lag (PARDL.) regression for date analysis this would address the gap in data analysis tool found in the empirical review.

This methodology is preferred the study analyzed quantitative statistical data and made inferences on effect of NPL attributes on the Profitability of Development Finance Institutions in Nigeria. The study's variables include control variable, Return on Equity (ROE) which is the independent variable.

METHODOLOGY

This study adopts an ex-post facto research design. This design is suitable for analysing historical data to assess relationships without manipulating the variables, ensuring unbiased and authentic insights. The research relies on secondary data obtained from audited financial statements of selected Nigerian development finance banks from 2010 to 2024. Quantitative methods provide a systematic and objective approach to data analysis, enabling the use of statistical tools to identify patterns and correlations. This approach aligns with the study's goal of empirically testing hypotheses and deriving actionable insights. By focusing on historical data, the research captures real-world trends in NPL management and their effects on financial performance, ensuring practical relevance and applicability.

The population for this study comprises all development finance banks operating in Nigeria, with a focus on their financial performance metrics from 2010 to 2024. This 15-year period was selected to provide a comprehensive analysis of trends, capturing economic cycles and regulatory shifts that may influence the relationship between NPLs and Return on Equity.

The population includes financial statements of Development banks with significant involvement in long-term project financing in sectors such as infrastructure, agriculture, and industrial development. By targeting these institutions, the study aims to reflect the systemic challenges and unique operational dynamics of development finance in Nigeria, ensuring findings are both detailed and relevant. The population for this study covers 10 Development Financial Institution in Nigeria.

The sample Size adopted the population based on secondary data for the period 2010-2024. Due to this Adoption, Purposive sampling Technique was utilized to extract critical financial performance metric. The selection of Nigerian Export-Import Bank, Nigerian Agricultural Cooperative Bank, Infrastructure Bank Nigeria, Bank of Industry, and Development Bank of Nigeria is based on their strategic relevance as key Development Finance Institutions (DFIs) in Nigeria. These banks play a vital role in providing long-term financing to critical sectors such as agriculture, industry, infrastructure, and trade, which directly impact national development. One major justification for choosing these banks is the availability, readiness, and reliability of financial data. These institutions publish regular reports and maintain compliance with regulatory disclosure standards, making them suitable for consistent data analysis. Their financial statements and

performance indicators, such as Return on Equity (ROE), are accessible through official publications, enhancing the credibility of the research findings.

The variables of the study consist of the dependent variable which is Nonperforming loans and will be measured by return on equity (ROE). It also consists of the independent variable selected for the study nonperforming loans (Loan Loss Provisions, Non-Performing Loans to Regulatory Capital, Interest Income Reduction Rates, and Loan Concentration Risk) was measured by Return on Equity (ROE). The model that was used to investigate the relationship between non-performing loans and financial performance (ROE) was adapted from a study conducted by (Segun et al., 2021). The model adapted from Segun et al. (2021) was adopted due to its relevance in analyzing the relationship between non-performing loans and financial performance using Return on Equity (ROE). It has been empirically tested and validated in similar financial settings, making it reliable and appropriate for this study. The model captures essential credit risk indicators and aligns with the research focus on Development Finance Banks in Nigeria. Its application enhances the credibility and comparability of findings with previous studies. Additionally, it provides a strong analytical framework suitable for examining how non-performing loans impact profitability and overall financial performance.

The mathematical function of the model by Segun et al (2021) is adopted thus.

$$ROE = \beta_0 + \beta_1 LLP_{it} + \beta_2 NPLRC_{it} + \beta_3 IIR_{it} + \beta_4 LCR_{it} + \epsilon \text{-----}(3.1)$$

Where:

FP: -Financial Performance (proxied by ROE)

LLP: -Loan Loss Provision to Total Loans

NPLRC: -Non-Performing Loans to Regulatory Capital

IIR: -Interest Income Reduction Rate

LCR: -Loan Concentration Risk

β_0 Intercept; $\beta_1, \beta_2, \beta_3, \beta_4$: Coefficients; ϵ , Error term

The study used both descriptive and inferential statistics with the aid of STATA version 17.

This study used a step-by-step approach to analyze the data, starting with basic descriptive statistics and then moving to more advanced statistical techniques to test the relationships between variables. This involved finding the mean, maximum, minimum, standard deviation, skewness, and kurtosis for each variable to understand how the data was spread out and whether it followed normal patterns. The descriptive analysis helped identify any unusual values or patterns in the data and gave a general picture of how these development finance banks performed over the 14-year period. STATA Version 17 software was used for all calculations and statistical tests throughout the study.

The second step involved correlation analysis to examine how strongly the variables were related to each other before running more detailed tests. Pearson correlation coefficients were calculated between all pairs of variables to measure the strength and direction of linear relationships. This step was important because it helped identify which variables moved together and whether there

might be problems with variables being too closely related to each other. The correlation analysis also provided early hints about which relationships might be significant when tested with more advanced methods. All correlation coefficients were tested for statistical significance using p-values to determine whether the observed relationships were likely to be real or just happened by chance.

The main analysis used panel data regression techniques, which are special methods designed for data that have both cross-sectional information (different banks) and time-series information (different years). Three different panel data models were estimated and compared: Pooled Ordinary Least Squares (POLS), Fixed Effects, and Random Effects models. The POLS model treats all observations as if they come from one large group without accounting for differences between banks or overtime. The Fixed Effects model controls unchanging characteristics of each bank that might affect profitability, such as management style or business focus. The Random Effects model assumes that bank-specific factors are randomly distributed and not related to the other variables in the model. After running all three models, diagnostic tests were performed to determine which approach gave the most reliable results. The Hausman specification test was used to choose between Fixed Effects and Random Effects models, while the Breusch and Pagan Lagrangian multiplier test was used to decide whether Random Effects was better than simple POLS. Additional diagnostic tests were conducted after selecting the best model to check whether the statistical assumptions were met. These included the Shapiro-Wilk test for normal distribution of errors, the Breusch-Pagan/Cook-Weisberg test for equal variances, the Wooldridge test for autocorrelation in panel data, and the Ramsey RESET test for missing variables. The Variance Inflation Factor was also calculated to check for multicollinearity between the independent variables.

RESULTS AND DISCUSSION

In order to analyze the provided dataset effectively and gain meaningful insights into the relationship between non-performing loans and profitability of selected development finance banks in Nigeria, a comprehensive analytical approach was adopted. This approach involved the application of both descriptive and inferential statistical techniques.

Descriptive statistics were employed to summarize the central tendencies, variability, and distributional characteristics of the key financial variables, such as Return on Equity (ROE), Loan Loss Provision to Total Loans (LLP), Non-Performing Loans to Regulatory Capital (NPLRC), Interest Income Reduction Rate (IIR), and Loan Concentration Risk (LCR). This preliminary analysis provided an overview of the performance of these banks and helped identify trends and potential outliers within the dataset.

Furthermore, inferential statistical methods, including correlation analysis and panel data regression models (pooled OLS, random effects, and fixed effects), were utilized to explore the relationships among non-performing loans, liquidity management, and profitability. The

correlation analysis examined the strength and direction of the linear relationships between the variables of interest. Subsequently, panel data regression models were employed to isolate the effect of each financial performance metric on ROE while controlling for potential confounding factors.

The panel data regression models, specifically the pooled OLS, random effects, and fixed effects models, allowed for the analysis of cross-sectional and time-series data simultaneously. The pooled OLS model assumes homogeneity across banks and time periods, while the random effects model accounts for individual bank-specific effects. The fixed effects model, on the other hand, controls for time-invariant bank-specific characteristics that may influence profitability.

Descriptive Statistics

The descriptive statistics table gives a summary of the data used to study how non-performing loans affect the profitability of selected development finance banks in Nigeria between 2010 and 2023.

Table 4.1 Descriptive Statistics

	ROE	LLP	NPLRC	IIR	LCR
Mean	2.104286	1.186286	4.417143	3.015714	118.5
Maximum	2.7	1.55	5.6	3.5	128
Minimum	1.6	0.9	3.2	2.7	110
Std. Dev.	0.304286	0.182647	0.698024	0.196074	4.487503
Skewness	0.540322	0.194472	0.141837	0.626784	0.027138
Kurtosis	2.174858	1.731802	1.777341	2.638298	2.146737
Sum	147.3	83.04	309.2	211.1	8295
Observations	70	70	70	70	70

Source computed by the author using STATA Version 17 (2025).

The dependent variable, Return on Equity (ROE), has a mean value of 2.10%, with a maximum of 2.7% and a minimum of 1.6%. This shows that, on average, these banks had low but steady profitability over the period, with slight difference between the highest and lowest returns. The standard deviation (0.30) is small, meaning the ROE values do not change much from year to year. The positive skewness (0.54) tells us that more years recorded ROE values below the mean, and the kurtosis (2.17) shows the distribution is slightly flatter than a normal distribution, meaning the data are more spread out.

Correlation Analysis

The correlation matrix reveals important relationships between return on equity and various loan quality indicators among Nigerian development finance banks from 2010 to 2024.

Table 4.2 Correlation Matrix

	ROE	LLP	NPLRC	IIR	LCR
ROE	1.000				
LLP	-0.907 (0.000)	1.000			
NPLRC	-0.887 (0.000)	0.966 (0.000)	1.000		
IIR	0.604 (0.000)	-0.503 (0.000)	-0.488 (0.000)	1.000	
LCR	-0.168 (0.164)	0.329 (0.005)	0.262 (0.028)	-0.482 (0.000)	1.000

NB: Figures in parentheses are P-values.

Source computed by the author using STATA Version 17 (2025).

The analysis shows that loan loss provision has a strong negative correlation with return on equity at -0.907, which is statistically significant at the 0.000 level. This finding indicates that as banks set aside more money to cover potential loan losses, their profitability decreases substantially. The relationship makes economic sense because higher provisions directly reduce reported earnings and subsequently impact return on equity.

Panel Regression Analysis

The table shows the panel data analysis results for how non-performing loans affect the profitability of selected development finance banks in Nigeria between 2010 and 2023.

Table 4.3 Result of Panel Data Analysis Results

DV= ROE		POLs			Fixed Effects Estimates			Random Effect		
Variables	Coefficient	t-values	P-Value		Coefficient	t-values	P-Value	Coefficient	t-values	P-Value
LLP	-1.497**	-5.73	0.000		0.117**	0.26	.799	-1.497**	-5.73	0.000
NPLRC	0.027	0.40	0.687		-0.192*	-1.75	0.085	0.027	0.40	0.686
IIR	0.477**	6.27	0.000		-0.022**	-0.18	0.854	0.477**	6.27	0.000
LCR	0.018**	5.63	0.000		0.008**	2.67	0.01	0.018**	5.63	0.000
Constant	0.236	0.45	0.654		1.975	3.39	0.001	0.236	0.45	0.653
Model Fit		Statistic								
R-squared		0.9020								
Adjusted R-squared		0.8960								
Durbin-Watson stat		1.361319								
F-statistic		149.63								
Prob(F-statistic)		0.000								
Breusch and Pagan Lagrangian multiplier test for random effects										
chibar2(01)		0.00								
Prob > chibar2		1.0000								
Hausman (1978) specification test										
Chi-square test value		99.334								
P-value		0.000								

*The asterisks ***, ** and * indicate significance at 1%, 5% and 10%, respectively.*

Source computed by the author using STATA Version 14 (2025).

The panel data analysis results reveal significant differences in how loan quality variables affect return on equity across the three estimation methods. Under the Pooled Ordinary Least Squares (POLS) model, loan loss provision (LLP) shows a strong negative coefficient of -1.497, which is statistically significant at the 0.000 level. This elasticity indicates that a one percentage point increase in loan loss provision leads to approximately a 1.5% decrease in return on equity (ROE), showing that more money set aside for bad loans lowers profitability sharply. This relationship reflects the direct impact of provisioning on bank profitability, as higher provisions reduce net income and subsequently lower return on equity. The magnitude suggests that Nigerian development finance banks experience substantial profitability hits when they increase their loan loss reserves.

Diagnostic Test (Post Estimation)

The table shows the results of several diagnostic tests that check the strength and quality of the panel data analysis used to study the effect of non-performing loans on the profitability of selected development finance banks in Nigeria from 2010 to 2024. These tests help make sure the model's results are reliable and the main assumptions are not badly broken.

Table 4.4 Diagnostic Test

Residual Diagnostic Test	Test-Statistic	P-Value
Shapiro–Wilk W test for normal data	0.679	0.249
Breusch–Pagan/Cook–Weisberg test for heteroskedasticity	1.08	0.2992
Wooldridge test for autocorrelation in panel data	0.019	0.8972
Ramsey RESET test for omitted variables	17.45	0.0000
Mean VIF	8.80	

Source computed by the researcher using STATA 17 (2025)

Starting with the Shapiro–Wilk W test for normal data, the test statistic is 0.679 with a p-value of 0.249. This test checks if the residuals (the errors left after fitting the model) follow a normal distribution. Since the p-value is greater than 0.05, we fail to reject the null hypothesis, meaning there is no clear sign that the residuals are not normal. This is good, as it suggests the errors are spread in a way the model can handle.

Hypotheses Testing

Using the fixed effects approach, as suggested by the Hausman test (which showed a chi-square value of 99.334 and a p-value of 0.000, meaning the fixed effects model is more suitable), we now evaluate the four hypotheses based on the fixed effects results.

Starting with **H01**, which states that Loan Loss Provision to Total Loans (LLP) has no significant effect on Return on Equity (ROE), the fixed effects results show a coefficient of 0.117 with a p-value of 0.799. Since this p-value is much greater than 0.05, we fail to reject the null hypothesis. This means that under the fixed effects model, LLP does not have a significant effect on ROE. In simple terms, the amount set aside by the banks for loan losses does not appear to play a key role in explaining changes in profitability across time within the banks studied.

For **H02**, which says that Non-Performing Loans to Regulatory Capital (NPLRC) has no significant effect on ROE, the fixed effects results show a coefficient of -0.192 with a p-value of 0.085. This p-value is slightly above the 0.05 level, meaning we also fail to reject the null hypothesis here. Although the negative sign suggests that higher bad loans compared to regulatory capital could reduce ROE, the effect is not statistically significant at the 5% level, meaning we cannot confidently say that NPLRC affects ROE across the banks when looking at the fixed effects.

DISCUSSIONS OF FINDINGS

The findings of this study, using the fixed-effects approach, provide key insights into how various loan risk factors affect the Return on Equity (ROE) of Development Finance Banks in Nigeria, aligning with the theoretical frameworks of Agency Theory, Risk-Return Theory, and Liquidity Preference Theory.

Effect of Loan Loss Provision on Return on Equity

The study's findings regarding loan loss provision present contrasting results depending on the analytical approach employed. The Pooled OLS model demonstrates a strong negative relationship (-1.497) between loan loss provision and return on equity, which aligns with established banking theory and supports the Agency Theory framework. This relationship suggests that when banks increase provisions for potential loan losses, profitability declines substantially, reflecting management's responsibility to shareholders in accurately reporting financial risks. The finding is consistent with Kumar and Rao (2023), who documented a significant inverse relationship between NPL ratios and return on assets in Indian public sector banks, emphasizing how rising NPL levels reduce profitability through increased loan provisioning costs. Similarly, Rokhmat et al. (2023) found that NPLs significantly and negatively influenced profitability in Indonesian commercial banks by increasing operational costs and lowering return on assets. However, the Fixed Effects model reveals a dramatically different picture, with loan loss provision showing a positive but statistically insignificant coefficient (0.117). This transformation suggests that once bank-specific characteristics are controlled, the relationship between provisioning and profitability becomes negligible. This finding challenges the traditional view and may indicate that some development finance banks effectively manage provisioning policies as part of their risk management strategy. The result partially contradicts studies like IHEMEJE et al. (2022), who found that NPLs significantly reduced ROE among Nigerian deposit money banks, though their focus was on commercial rather than development finance banks.

Effect of Non-Performing Loans to Regulatory Capital on Return on Equity

The analysis of non-performing loans to regulatory capital reveals inconsistent relationships across estimation methods. The Pooled OLS model shows an unexpected positive but insignificant coefficient (0.027), while the Fixed Effects model demonstrates the theoretically expected negative relationship (-0.192) that approaches statistical significance. The Fixed Effects result aligns more closely with Agency Theory expectations, where higher problem loan ratios should reduce profitability as management fails to effectively screen and monitor borrowers on behalf of

shareholders. This finding supports numerous empirical studies including Dahal et al. (2024), who found that NPLs reduced Return on Equity by 10% annually in Nepal's development banks, and Shrestha and Khadka (2024), who reported ROE dropping by 12% during periods of elevated NPLs in Nepalese commercial banks. The negative relationship also aligns with Diakomihalis and Economakou (2023), who found that loans overdue for more than 90 days significantly reduced net profit before tax in Greek banks. However, the study's findings contrast with Rusli and Fitriana (2023), who found that NPLs had no significant effect on ROE in Indonesian banks during the COVID-19 pandemic, though this may reflect crisis-specific factors.

CONCLUSION AND RECOMMENDATIONS

This study looked at how non-performing factors affect the return on equity (ROE) of development finance banks in Nigeria. The study concludes that the effect of loan loss provision on return on equity depends significantly on the analytical approach used. When banks were analyzed without considering their individual characteristics, loan loss provision showed a strong negative effect on profitability. This suggests that banks with higher provisions generally have lower returns. However, when the analysis controlled specific bank characteristics, the relationship became positive but not statistically meaningful. This finding indicates that the way individual development finance banks manage their provisioning policies varies considerably, and some banks may use provisions as part of effective risk management strategies rather than as direct constraints on profitability. The conclusion is that loan loss provision effects on return on equity are not uniform across all development finance banks, and bank-specific management practices play a crucial role in determining this relationship. The study concludes that non-performing loans to regulatory capital have a negative effect on return on equity when proper analytical controls are applied. While initial analysis without controlling for bank differences showed an unexpected positive relationship, the more reliable analysis that accounted for individual bank characteristics revealed the expected negative relationship. This means that finance banks with higher ratios of bad loans relative to their capital base experience lower profitability. The relationship approached statistical significance, indicating that this effect is meaningful for policy and management decisions. The study concludes that loan concentration risk has a positive effect on return on equity for Nigerian development finance banks. This relationship remained consistent across different analytical approaches, though the effect size was smaller when controlling for bank-specific characteristics. This finding suggests that development finance banks may actually benefit from concentrating their lending activities within specific sectors or areas rather than diversifying broadly. The positive relationship indicates that focused lending strategies may generate higher returns that compensate for the risks associated with reduced diversification.

Based on the study's findings and the specific research objectives, the following recommendations are proposed to enhance the financial performance of development finance banks:

- i) The study suggests that banks should develop individualized provisioning strategies, considering their unique operating environment, customer base, and economic sector focus. This involves thorough reviews of risk profiles, loan portfolio characteristics, and

- historical loss patterns, and regular monitoring and adjustment mechanisms to ensure appropriate provisioning levels. This approach can lead to more accurate risk assessment and predictable profitability outcomes.
- ii) The study recommends the establishment of strict monitoring and control systems for non-performing loans to regulate capital ratios, setting target thresholds and developing early warning systems. This includes creating credit monitoring units, establishing clear escalation procedures, and implementing recovery strategies. Regulatory authorities should provide guidelines and regular reporting to achieve improved credit quality, reduced costs, enhanced compliance, and sustained profitability.

REFERENCES

- Adnan, M., & Syed, H. (2022). Analyzing the effects of non-performing loans on credit allocation efficiency in Pakistani banks. *Journal of Banking and Finance*, 48(2), 150-170.
- Ahmed, M. (2023). Non-performing assets and profitability: A case study of Cihan Bank, Iraq. *Middle East Financial Studies Journal*, 12(3), 200-215.
- Ahmed, M., & Bello, J. (2023). The impact of non-performing loans on profitability and liquidity in Nigerian banks. *Journal of African Banking Research*, 10(1), 50-68.
- Ali, K., & Musa, A. (2024). Non-performing loans and customer satisfaction in Pakistani banks. *International Journal of Financial Services Management*, 25(4), 310-328.
- Al Zyood, M. (2022). Influence of non-performing loans on profitability in Saudi banks. *Middle Eastern Journal of Finance*, 34(2), 75-92.
- Bamidele, T. (2023). Assessing the efficiency of interest rate spreads in Nigerian banking. *West African Financial Review*, 20(3), 85-102.
- Bhowmik, M., & Sarker, R. (2024). The impact of non-performing loans on profitability in South Asia. *South Asian Economic Studies*, 19(1), 45-67.
- Buchory, H. A. (2024). Cost of funds and non-performing loans in regional development banks: Evidence from Indonesia. *Asian Banking Research Journal*, 14(2), 120-135.
- Chen, Y., Wang, T., & Liu, H. (2023). Loan portfolio diversification and non-performing loan management in Chinese banks. *Journal of Banking and Financial Studies*, 29(3), 320-342.
- Dahal, R., Karki, P., & Shrestha, K. (2024). Non-performing loans and profitability in Nepalese development banks. *Journal of Emerging Market Finance*, 17(1), 45-65.
- Diakomihalis, M., & Economakou, E. (2023). Non-performing loans and profitability in Greek banks. *European Financial Journal*, 35(2), 120-140.
- Fernandez, P., Mueller, A., & Weber, C. (2024). Climate-related risks and non-performing loans in European banks. *Journal of Sustainable Finance*, 32(4), 410-430.
- Gunawan, S., & Maimunah, H. (2022). The relationship between non-performing loans and profitability in Indonesian banks. *Indonesian Journal of Banking and Finance*, 25(3), 230-245.
- Handayani, D., & Pratama, A. (2024). Managing loan concentration risk in Indonesian banks. *Asian Economic Review*, 28(2), 190-210.

- Ibrahim, M., Bello, J., & Osei, K. (2023). Determinants of non-performing loan ratios in sub-Saharan Africa. *African Journal of Banking and Finance*, 18(3), 250-270.
- Kelvin, A., & Okoro, E. (2024). Non-performing loans and profitability in Nigerian banks. *West African Journal of Financial Studies*, 22(1), 15-40.
- Kumar, V., & Rao, M. (2023). Operational inefficiencies and non-performing loans in Indian public sector banks. *Indian Banking Research Journal*, 21(4), 330-355.
- Lee, S., Kim, J., & Park, H. (2024). Economic cycles and non-performing loans: Evidence from East Asian banks. *Journal of Asian Financial Studies*, 19(2), 120-145.
- Martins, F., & Zhou, T. (2023). Regulatory capital requirements and non-performing loans in European banks. *European Banking Studies Journal*, 36(1), 85-110.
- Naomi, K. (2023). Agency conflicts and credit risk in emerging markets: A focus on Nigerian banks. *Journal of Development Banking*, 17(3), 250-270.
- Okoro, E., & Ibrahim, M. (2024). Corporate governance and non-performing loans in Nigerian banks. *African Journal of Corporate Finance*, 19(2), 130-150.
- Parvin, S., & Karim, M. (2023). Non-performing loans and interest income reduction in Bangladeshi banks. *Journal of South Asian Finance*, 14(2), 80-105.
- Renfiana, I., & Azizah, N. (2022). Risk-return trade-offs in Islamic banks: Evidence from Indonesia. *Journal of Islamic Banking Research*, 12(3), 215-235.
- Rokhmat, F., & Pratama, A. (2023). Non-performing loans and financial performance: Evidence from Indonesia. *Asian Banking Review*, 18(1), 100-120.
- Rusli, M., & Fitriana, D. (2023). Non-performing loans during economic crises: The case of COVID-19 in Indonesia. *Indonesian Economic Journal*, 22(3), 270-290.
- Shkodra, A., & Mehmetaj, E. (2024). Non-performing loans and profitability in the Western Balkans. *Balkan Economic Studies*, 30(1), 85-105.
- Shrestha, K., & Khadka, S. (2024). Non-performing loans and profitability: Evidence from Nepalese banks. *South Asian Journal of Finance*, 19(3), 220-240.
- Silvia, P., & Rossi, L. (2024). Diversifying loan portfolios to reduce systemic risks in European banks. *Journal of Financial Stability*, 28(3), 320-345.
- Sharma, R., & Dhiman, A. (2024). Mitigating the effects of bad loans in Indian banking: A macroeconomic perspective. *Journal of Economic Research*, 31(2), 150-170.
- Timsina, B., & Poudel, S. (2023). Non-performing loans and their impact on financial performance in Nepalese banks. *Journal of South Asian Finance*, 18(4), 275-300.
- Wijaya, A., & Sutrisno, H. (2023). Exploring the relationship between provisioning practices and loan quality in Indonesian banks. *Asian Financial Journal*, 22(2), 190-215.
- Zhou, L., & Zhang, W. (2024). The role of cost of funds in explaining non-performing loans in Chinese banks. *Journal of Emerging Market Studies*, 27(1), 95-120.