International Journal of Economics, Commerce and Management
United Kingdom ISSN 2348 0386 Vol. 11, Issue 7, July 2023

https://ijecm.co.uk/

EFFECT OF CREDIT RISK ON THE FINANCIAL PERFORMANCE OF QUOTED DEPOSIT MONEY BANKS IN NIGERIA

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Abstract

This study examines the effect of credit risk on the financial performance of quoted deposit money banks in Nigeria. The ratio of non-performing loans to total loans and the ratio of loan loss provision to total loans were used to measure credit risk, while Return on Assets (ROA) was used to measure financial performance. Data were collected from the annual financial reports of each of the deposit money banks. The study utilized panel regression to analyse the data from a sample of eleven (11) quoted deposit money banks on the Nigerian Exchange Group from 2014- 2021. The results of the panel regression revealed that non-performing loans to total loans and loan loss provision to total loans have a significant effect on the financial performance of the quoted deposit money banks in Nigeria. The study recommends that quoted deposit money banks should improve their methods for assessing credit risk by establishing strict guidelines for loan underwriting, carrying out in-depth borrower assessments, and assessing the strength of collateral. Also, deposit money banks should routinely review and update their credit risk models, to account for changes in market circumstances, borrower behaviour, and macroeconomic factors. This involves increasing the precision of credit risk assessments which using advanced analytics and risk management technologies.

Keywords: Non-Performing Loans to Total Loans, Loan Loss Provision to Total Loans, Financial Performance, Credit Risk

INTRODUCTION

The Nigerian banking industry is essential to the nation's ability to thrive and flourish economically. The banking industry provides a medium through which funds are withdrawn from those who have excess and channelled to deficit units of the system. Deposit Money Banks (DMBs) are a part of this process, where lenders of funds are primarily households and firms, that supply funds to the ultimate borrowers who are mainly firms, governments and households; through financial markets which consist of money markets, bond markets and equity markets and through banks and other financial intermediaries (Allen & Carletti 2016). Deposit Money Banks have undergone substantial changes over the years as an emerging market due to regulatory reforms, increased competition, and changing market dynamics. However, one persistent challenge faced by Deposit Money Banks (DMBs) in Nigeria due to the nature of their business is credit risk.

Credit creation is the main income-generating activity for banks (Adegbie & Otitolaiye, 2020). However, this process carries huge risks in terms of both the lender and the borrower. A risk arising from a trading partner's failure to fulfil its contractual obligations on time or at any

later time may considerably jeopardize the bank's business. Granting of credit facilities to customers by banks is associated with a high level of default of both capital and interest, which required effective credit management to minimize the credit risk and enhance financial performance (Chuke & Chinedu, 2018).

The amount of credit risk exposure DMBs experience can have a big impact on their financial performance. This is because the profitability of the banks is reduced, their capital adequacy is weakened, and their susceptibility to financial difficulty grows when loans go bad and debtors default (Taiwo et al., 2017). Bank managers, policymakers, and regulators must comprehend the effect of credit risk on the financial performance of quoted DMBs in Nigeria to develop efficient risk management strategies and guarantee the stability and sustainability of the banking industry.

Credit risk is particularly important in the Nigerian environment because of several reasons, including the prevalence of non-performing loans (NPLs), lax credit evaluation procedures, insufficient collateral, and economic turbulence (Kajola et al., 2018). Rising non-performing loans threaten the financial performance of banks, as it reduces both the bank's profit and its intermediation capacity (Nwosu et al., 2020). According to Bhattarai (2017), the immediate consequence of the large amount of non-performing loans (NPLs) in the banking system is bank failure. Considering that the banking industry is a pillar of the economy, any shock to the industry would certainly affect the financial system and the economy as a whole. A higher loan loss provision to total loans ratio means that the bank has set aside more of its capital or earnings to protect against probable loan losses. Given that the bank is taking proactive steps to foresee and reduce probable loan defaults or credit losses, this reflects a more cautious and practical approach to credit risk management (Ng et al., 2020). A lesser allocation of provisions to cover possible loan losses, on the other hand, is indicated by a lower loan loss provision to total loans ratio. This may be a sign of increased risk because the bank may have less room for future credit losses (Ahmed et al., 2015; Ng et al., 2020).

In the past, the Nigerian banking industry has experienced periods of distress and systemic crises, which were frequently brought on by excessive exposure to credit risk. The most prominent incident was the banking crisis of 2009, which brought numerous banks to a near-collapse and forced the Central Bank of Nigeria (CBN) to restructure the banking industry completely. The reform initiatives attempted to increase the financial soundness and stability of DMBs by enacting tougher prudential regulations and bettering risk management procedures. This study seeks to examine if these credit risk reforms have been effective by investigating their effect on financial performance.

The majority of studies, including those by Umar et al. (2022); Chuke and Chinedu (2018); Kajola et al. (2018); and Adegbie and Otitolaiye (2020) conducted in Nigeria on credit risk and financial performance, combined data from before and after the adoption of the International Financial Reporting Standards (IFRS), which may have had an impact on their findings because the adoption of IFRS in 2012 changed how annual financial statements are reported. This study, therefore, examined the effects of credit risk on the financial performance of quoted Deposit Money Banks in Nigeria from 2014 to 2021, using the panel regression technique. The specific objectives are to:

i. Examine the effect of Non-Performing Loans to Total Loans on the financial performance of quoted Deposit Money Banks in Nigeria.
ii. Investigate the effect of Loan Loss Provision to Total Loan on the financial performance of quoted Deposit Money Banks in Nigeria.

To achieve the objectives of this study, it was postulated that:

H_{01}: Non-Performing Loans to Total Loans have no significant effect on the financial performance of quoted Deposit Money Banks in Nigeria.

H_{02}: Loan Loss Provision to Total Loan have no significant effect on the financial performance of quoted Deposit Money Banks in Nigeria.

LITERATURE REVIEW

Conceptual Framework

Credit Risk

Credit risk, also called default risk, is the risk associated with a borrower going into default that is not making payments as promised (Umar et al., 2022). The borrower always can default on his or her commitments for one or the other reason resulting in the crystallization of credit risk to the bank. These losses could take the form of outright default or losses from changes in portfolio value arising from actual or perceived deterioration in credit quality that is short of default. Credit risk is the risk that a borrower defaults and does not honour its obligations to service debt (Taiwo et al., 2017). In Credit risks, the lender may lose interest associated with a loan due to the risk that a borrower may fail to repay (Agbamuche, et al., 2022). In the first instance, interference with cash flows, loss of principal and interest and amplified costs of collection are some of the risks that may affect the lender (Al-Qudah & Jaradat, 2013).

Credit risk is viewed to be the extent of value variations that occur in debt instruments as well as in derivatives because of the variations in debtors' and counterparties' credit quality (Tijani & Abdullahi, 2021). This risk is the very vital risk source for the capital adequacy of

banking institutions (IFRI-CRO, 2007). However, the net worth and profitability are not only determined by the default risk of assets but also by off-balance sheet items, re-pricing characteristics, liabilities, and overall credit quality (Drehmann et al., 2018).

The management of credit risk is very imperative to banks because it is a vital part of the loan process, maximizes the risk of the bank to increase their performance, and adjusts the risk rate of return by protecting the bank from the negative influence of credit risk (Ogunlade & Oseni, 2018). Credit risk has been measured using non-performing loans divided by total loans (Bhattarai, 2018; Nwosu et al., 2020) and loan loss provision divided by total loans (Nguyen, 2022). In this study, credit risk is measured using non-performing loans divided by total loans and loan loss provision divided by total loans following the path of Nguyen (2022), Bhattarai (2018) and Nwosu et al. (2020) since we are considering credit risk in deposit money banks.

Non-Performing Loans to Total Loans

Non-Performing Loans (NPLs) are loans that remain unpaid. A loan is considered an NPL if it does not generate interest and the principal amount for a minimum of 90 days (Corporate Finance Institute, 2022). Loans become NPLs if the full payment of the principal amount and interest is not done on the due date and is no longer expected on future dates (Muhammad et al., 2020). In this study, the NPLs were measured as the ratio of NPLs to total loans.

Non-performing loans to total loans is a critical ratio that measures the proportion of non-performing loans (NPLs) in the total loan portfolio of a deposit money bank (Jolevski, 2017). It is a commonly used metric to assess the credit risk exposure and asset quality of banks. Analyzing the ratio of non-performing loans to total loans in this study on the Nigerian banking industry sheds light on the degree of credit risk that quoted DMBs are exposed to. The effectiveness of the bank's management and mitigation of credit risk is assessed using this ratio. To calculate the non-performing loans to total loans ratio, divide the total value of non-performing loans by the total value of loans in a bank's portfolio and multiply by 100 to express it as a percentage (Shuibin et al., 2020). The total amount of non-performing loans is divided by the total amount of loans in a bank's portfolio and the result is multiplied by 100 to get the non-performing loans to total loans ratio. The formula is as follows:

Non-performing Loans to Total Loans (%) = (Non-performing Loans / Total Loans) * 100

A larger percentage of the loan portfolio that is either already in default or is at risk of default is indicated by a higher ratio of non-performing loans to total loans (Nwosu et al., 2020). This suggests that the bank is more exposed to credit risk, which could have an effect on its financial performance, profitability, and stability as a whole. In contrast, a smaller ratio of non-

performing to total loans denotes a loan portfolio that is healthier and has fewer loans that are in default or at risk of default. A smaller percentage typically denotes strong underwriting standards, efficient credit risk management procedures, and a greater possibility of earning consistent income from interest payments (Atoi, 2018). To evaluate the asset quality and credit risk profile of a bank, it is critical to track the trajectory and magnitude of the non-performing loans to total loans ratio. A rising percentage over time could be a sign of declining loan quality and possible difficulties in loan recovery or resolution. A declining ratio, on the other hand, denotes better credit risk management techniques and a stronger loan portfolio (Viswanadham, 2015).

The non-performing loans to total loans ratio for quoted DMBs in Nigeria were analysed to get important insights into how credit risk affects the financial performance of these banks. To determine how credit risk affects the overall financial health and sustainability of the stated DMBs by evaluating the correlation between this ratio and financial performance indicators like return on asset.

Loan Loss Provision to Total Loans

Understanding the factors that change a bank's allowance for credit loss is vital because banks have an essential role in providing credit to the economy. Furthermore, any more provisions than necessary can reduce a bank's lending capacity, profitability, and growth (Ng et al., 2020). Loan Loss Provision (LLP) received more and more attention after the global financial crisis of 2008-2009 when banks tended to make higher provisions to compensate for problem loans during the economic downturn (Danisman et al., 2020).

Loan loss provision to total loans is a significant ratio that reflects the extent to which a deposit money bank (DMB) sets aside funds to cover potential loan losses. It measures the bank's proactive approach to managing credit risk by allocating reserves or provisions to cushion against potential defaults and mitigate the impact on financial performance (Nguyen, 2022). The ratio of loan loss provision to total loans provides insights into the bank's preparedness and prudence in managing credit risk. This ratio helps evaluate the bank's ability to absorb potential losses arising from non-performing loans (NPLs) within its loan portfolio (Bhattarai, 2018). The loan loss provision to total loans ratio is calculated as follows:

Loan Loss Provision to Total Loans (%) = (Loan Loss Provision / Total Loans) * 100

Monitoring the trajectory and size of the loan loss provision to total loans ratio is essential for determining the sufficiency of the bank's provisions and its capacity to properly manage credit risk. A rising ratio over time may be a sign that the bank is raising its reserves to improve its ability to withstand prospective loan losses. On the other side, a declining ratio can

signify a lower amount of provisioning, possibly indicating higher exposure to credit risk or unduly optimistic appraisals of the loan portfolio (Agbamuche et al., 2022; Danisman et al., 2020).

Financial Performance

Financial performance is defined as a subjective measure that determines how well the organizations use their available resources to generate more revenues (Abdullahi et al., 2021). Financial performance measures the financial soundness and health of the organization in monetary terms and thus, can be used to compare the performance of different corporations within any particular industry or between industries (Ahmed et al., 2021). Financial performance indicates the level of operations of a firm over a given period, which is articulated in terms of returns and losses for a specified duration (Emeakponuzo, 2021). Concerned stakeholders judge the outcome of a business's strategies and processes in objective monetary terms by assessing the performance. According to Kah et al. (2022), financial performance can be defined as how well a firm uses the resources at its exposure to generate returns for its investors.

The study by Makokha et al. (2016) and that of Shrivastave et al. (2018) posited that financial performance is the measure of how well a firm uses its assets to generate revenues. This definition is used as a general measure of a firm's overall financial soundness over a given period and can be used to compare similar firms in the same industry and across the industry in aggregate. This is the working definition of this study on financial performance, therefore to this end, we posit that the performance of deposit money banks can be surrogated by Return on Assets (ROA). The return on Assets (ROA) is a ratio that measures company earnings before interest & taxes (EBIT) against its total net assets. The ratio is considered an indicator of how efficiently a company is using its assets to generate income before contractual obligation must be paid. It is calculated as ROA= EBIT/ Total Assets.

Empirical Reviews

Non-Performing Loans to Total Loans and Financial Performance

Agbamuche et al. (2022) examined the effect of credit risk on financial performance, three (3) specific objectives and hypotheses were postulated to test the relationship between the variables of the study. Data was collected from audited financial reports of five first-tier banks listed banks and data analysis was conducted using descriptive statistics, correlation analysis and panel regression analysis. Findings from the study revealed that non-performing loans and impairment loan charge-offs had a negative and significant effect on the financial

performance of listed banks, while capital adequacy had a positive but inconsequential effect on the financial performance of listed banks. The study, therefore, recommends that banks should be more critical with an assessment of loans and bring up-to-date their terms and conditions to reflect new realities that can increase their nonperforming loans. The researchers have done well with the analysis of the study; however, the recommendations were not based on the findings of the study only a general recommendation was made which might not be good for policy implementation.

Nwosu et al., (2020) examined the extent to which non-performing loans affect commercial bank profitability and suggested measures toward mitigating their impact on the banking sector in Nigeria. Data on a sample of 18 commercial banks, covering the first quarter of 2014 to the fourth quarter of 2018 were analysed using the panel fixed effect and auto-regressive distributed lag models. Empirical results showed a negative and statistically significant impact of non-performing loans on banks' profitability. Most of the coefficients of other determinants of bank profitability were in line with apriori expectations. The study showed that lower bank profitability can be explained by a higher volume of non-performing loans, increased liquidity ratio and inflation, while higher profitability could be a result of an increase in bank size and capital adequacy ratio. Based on the findings, the study advised the need for the risk management team of banks to strengthen their credit management strategies, and consider offering professional advice to the loan customers on possible ways of efficiently investing their loan to ensure the needed return on investment is attained.

Atoi (2018) examined Non-Performing Loans (NPL) and their effects on the stability of Nigerian banks with national and international operational licenses from 2014Q2 to 2017Q2. A restricted dynamic GMM is employed to estimate the macroeconomic and bank-specific drivers of NPL for each licensed category. Z-Score is constructed to proxy banking stability, and its response to shocks NPLs is examined in a panel vector autoregressive framework. The results reveal that drivers of NPLs vary across the two categories of banks, but, the weighted average lending rate is a vital macroeconomic driver of NPLs for both. The results also confirm the moral hazard hypothesis and risk-return tradeoff of efficient market theory. Furthermore, international banks withstand NPLs shocks in the long run, despite temporary flux in the short horizon, while the stability of national banks is susceptible to NPL shocks in the long run. The study recommends that the weighted average lending rate, anchored on the monetary policy rate should be the focus of banks' regulators when addressing issues of NPLs. Again, strategies for mitigating the short-run impacts of NPLs on the stability of internationally licensed banks should be incorporated into the offsite regulatory framework to ensure banking stability.

Jolevski (2017) investigated the influence of the non-performing loans ratio on profitability indicators in the banking system of the Republic of Macedonia for the period 2007-2015. The analysis presents the correlation and regression between the non-performing loan ratio of non-financial entities and profitability indicators: rate of return on assets and rate of return on equity, as well as the spread between interest rates on loans and deposits in denars. The results of such correlation show a moderately high negative correlation between the non-performing loans ratio and rates of return on equity and return on assets. Regression analysis shows that increasing the nonperforming loan ratio influences reducing bank profitability. Also, the statistical analysis confirms that the profitability position of the real sector is one of the most important factors affecting the movement and level of non-performing loans.

Viswanadham (2015) ascertained the determinants of nonperforming loans in the National Bank of Commerce. Data was collected from 152 respondents. Tables, percentages, mean and standard deviation were used to analyze data. Data collection methods adopted for the study were interviews, questionnaires and documentary evidence. Interest rate, GDP, the concentration of lending activities, the bank's loan supervision capacity and economic condition were investigated, and the results suggest that interest rate, GDP, bank's loan supervision capacity and economic condition influence the level of NPLs. However, the results did not suggest that the concentration of lending activities increases the level of NPLs. The study suggests that banks should put in place a vibrant credit process that ensures proper customer selection and risk identification, robust credit analysis, proactive monitoring and clear recovery strategies for bad loans, formulate a clear policy framework that addresses issues of ethical standards and check and balance credit process, organizational capacity enhancement of banks, deliberate effort to develop credit culture for managing loans and ensure prudent policies that govern bank loans. To extend the literature on non-performing loans, the researcher suggested incorporating models of the Golem effect, Social loafing, Inverted pyramid effect, Pollyanna effect and High default culture effect. Also, based on the merits of the study, the researcher suggests determining the relationship between non-performing loans and loan size, collateral, credit culture, and credit management information system.

Loan Loss Provision to Total Loans and Financial Performance

Nguyen (2022) examined factors affecting loan loss provisions during the Covid-19 pandemic: The case of commercial banks in Vietnam. The study uses OLS, FEM, REM, and FGLS to assess the factors affecting loan loss provisions (LLPs) of 20 Vietnamese commercial banks during the Covid-19 pandemic from Q1/2020 to Q4/2021. The result of the model is based on FGLS to overcome the phenomenon of heteroscedasticity after using estimation by

OLS, FEM, and REM, showing that the factors affecting LLP of Vietnamese commercial banks during the Covid pandemic include: bank size (SIZE), non-performing loans ratio (NPL), a ratio of pre-tax profit and provision to total assets (CROA), loans to total assets ratio (LOAN), and credit growth (ΔCREDIT). Research results using the FGLS method show that bank size, bad debt ratio, pre-tax profit ratio and provision to total assets and credit growth positively impact the LLP of the Vietnamese commercial banks in the Covid pandemic. However, interestingly, the percentage of loans to total assets can decrease the provision for loan losses. Thereby, the study proposes some policy implications as follows: The SBV needs to have a policy to limit credit growth and bad debt ratio for commercial banks to control the competition for a market share of loans without ensuring the quality of loans, leading to an increase in credit risk and LLP. Furthermore, each Vietnamese commercial bank needs to develop and apply a practical and comprehensive credit process to ensure debt recovery to avoid a lot of bad debts. For new customers, banks need to fully assess all aspects to predict the level of risk before deciding to provide loans. Additionally, the long-term effects of Covid-19 cause difficulties for commercial banks' activities, SBV needs to consider supportive policies through interest rate reduction, grace periods, and debt extension to increase financial performance and maintain the market share and profits of commercial banks.

Shuibin et al. (2020) explored the affiliation between a non-performing loan, capital adequacy ratio, loan loss provision, and bank profitability. The study was conducted on the licensed commercial banks in Ghana for the era 2014-2019. The two-step system generalized method of moments estimator was utilized to test the hypothesis developed for the study. The independent study variables altogether demonstrated a negative and immaterial association with the bank's profitability as proxied by ROA. A robustness test was conducted utilizing the Three-Stage Least-Squares Regression (3SLS); the outcome was analogous to that of the Two-Step System Generalized Method of Moments estimator. The study suggests that the Central Bank fortifies the capital requirement and keenly monitors banks' risk-taking conduct and banks undertaking due diligence procedures to moderate the shock of non-performing loans and loan loss provisions in other to augment the profitability of universal banks.

Bhattarai (2018) ascertained determinants of loan loss provisions (LLPs) of commercial banks in Nepal using pooled data from ten commercial banks with 50 observations over the period of 2012/13 to 2016/17. The descriptive and causal-comparative research designs were adopted for the study. The study used loan loss provision on total assets as dependent variables and the natural logarithm of total assets, total loan to total assets ratio, nonperforming loan to total assets ratio, earnings before taxes and provisions to total assets, capital adequacy ratio, loan to deposit ratio taken as independent variables. The estimated regression model

reveals that nonperforming loan ratio (NPL) and loan-to-deposit ratio are significant positive impacts on loan loss provisions. The study concluded that the nonperforming loan ratio (NPL) and loan-to-deposit ratio are the main determinants of loan loss provisions of commercial banks in Nepal.

Ahmed et al. (2015) examined the impact of loan loss provisions of the banks on the performance of the banks operating in Pakistan. Moreover, the other factors that affect banking profitability have been discussed in this study. The results show that the loan loss provision of the banks is of paramount importance in affecting their profitability. A well-managed bank is perceived to be of lower loan loss provision and such an advantage will be translated into higher profitability. In addition, banks' advances and deposits represent a vital role in the determination of banking profitability. Finally, regarding non-financial variables, political instability in the previous period has a more significant effect on the present bank's profitability rather than the political instability in the present period.

Theoretical Framework

The Anticipated Income Theory

In 1949, Prochnow conducted a thorough investigation that led to the creation of a new lending theory he named "the Anticipated Income Theory." In their investigation, Afriyie and Akotey (2012) found that the bank planned to liquidate term loans using the borrower's anticipated earnings regardless of the borrower's business nature or character. Instead of anticipating the borrower's income, liquidity is achieved as opposed to selling the borrower's assets as per the traditional or commercial theories of liquidity or transferring the term loan to a different lender as per the shiftability theory of liquidity. This theory essentially holds that rather than lending money based on the borrower's present value, banks should do so.

A noteworthy aspect of this theory, according to Kolapo et al. (2012) study, is its focus on the future when it comes to bank loans and advances, commonly known as the "cash flow approach" to lending. If this theory was properly understood, it was competing with the commercial loan hypothesis rather than the shift ability theory. The idea that secondary reserves are the most important source of liquidity for banks is not called into doubt by this. Instead, it once again focused on the kinds of loans that banks should make but came to a different result than those who support the commercial lending theory (Moti et al., 2012). Because of this, the anticipated income theory will be the main focus of this study. It holds that when information about a borrower's income is available and can be predicted and known, the risk associated with such a loan can be significantly reduced or mitigated, and other necessary actions can be taken to reduce its likelihood of occurring in the future.

METHODOLOGY

This study adopts an ex-post facto research design. This is because the phenomenon observed in the study has already taken place. Ex post facto research is ideal for conducting social research when is not possible or acceptable to manipulate the characteristics of human participants (Kerlinger, 1986). The population of this study comprises all the twelve deposit money banks quoted on the Nigerian exchange floor. Namely: Fidelity Bank Plc, Stanbic IBTC Bank Plc, Access Bank Plc, First City Monument Bank Plc, Ecobank Transnational Incorporated, First Bank Plc, Guaranty Trust Bank Plc, United Bank of Africa Plc, Unity Bank Plc, Sterling Bank Plc, Wema Bank Plc and Zenith Bank Plc. A judgmental sampling technique was adopted, so Ecobank Transnational incorporated was exempted from the sampled banks due to accessibility to data, therefore eleven quoted deposit money banks in Nigeria were used as the sample size for this study. The eleven (11) quoted deposit money banks were sampled for an eight (8) year period spanning from 2014-2021 which is the period after the adoption of IFRS. The eight (8) year period is chosen to have fairly, reasonable and reliable up-to-date financial data. This study made use of panel secondary data precisely. The data were sourced from the annual reports and accounts of the quoted deposit money banks.

Table 1: Measurement Table for Dependent and Independent Variables

Variables Specification	Proxied By	Description	Sources
Dependent Financial Performance	Return on Asset (ROA)	$\frac{\text{EBIT}}{\text{Total Assets}}$	Nguyen (2022), Shuibin et al. (2020)
Independent Credit Risk	Non-Performing Loans to Total Loans (NPLTL)	$\frac{\text{Non-Performing Loans}}{\text{Total Loans}}$	Bhattarai (2018); Nwosu et al., (2020)
	Loans Loss Provision to Total Loans (LLPTL)	$\frac{\text{Loans Loss Provision}}{\text{Total Loans}}$	Nguyen (2022)

The study employed panel regression analysis to establish the relationship between Non-Performing Loans to Total Loans, Loan Loss Provision to Total Loans and financial performance (Return on Asset) for selected quoted deposit money banks. The panel regression model is formulated below:

$FPERF_{it} = \beta_0 + \beta_1 NPLTL_{it} + \beta_2 LLPTL_{it} + \varepsilon_{it}$

Where:

$FPERF_{it}$ = Financial Performance in *i* year *t*

β_0 = Coefficient of the constant variable

$NPLTL_{it}$ = Non-Performing Loans to Total Loans in *i* year *t*

$LLPTL_{it}$ = Loan Loss Provision to Total Loans in *i* year *t*

β_1, β_2=Regression coefficients of independent variables

ε_i= error term.

Decision Rule:

If the p-value is < 5%, then the null hypothesis is rejected, otherwise the null hypothesis is accepted.

The study employed descriptive statistics to know the characteristics of the variables, Pearson Product Moment correlation; to know the relationship among the variables, the Hausman test was carried out to know whether Fixed Effects or Random Effects is more appropriate and the panel regression technique to test relationships among theoretically related variables and estimate the effects of one variable on the other with the aid of statistical package (EVIEW 10). To ensure the reliability of results, the study carried out some diagnostic tests like autocorrelation, heteroskedasticity and stability. The essence is to guard against spuriousness as observed by Granger and Newbold (1974) and Gujarati and Porter (2009) that, the presence of these factors usually introduces bias in the OLS estimators and thus, any conclusion drawn from the results will be spurious.

The Durbin–Wu–Hausman test (also called the Hausman specification test) is a statistical hypothesis test in econometrics named after James Durbin, De-Min Wu, and Jerry A. Hausman (Durbin, 1954; Wu, 1973; Hausman, 1978; Nakamura & Nakamura, 1981). The test evaluates the consistency of an estimator when compared to an alternative, less efficient estimator which is already known to be consistent (Greene, 2012). It helps one evaluate if a statistical model corresponds to the data. The Hausman test was used to differentiate between the fixed effects model and the random effects model in panel analysis. In this case, Random Effects (RE) are preferred under the null hypothesis due to higher efficiency, while the alternative Fixed effects (FE) are at least as consistent and thus preferred.

$$H = (b_1 - b_0)' \left(\operatorname{Var}(b_0) - \operatorname{Var}(b_1) \right)^{\dagger} (b_1 - b_0),$$

Where:

† denotes the Moore–Penrose pseudoinverse. Under the null hypothesis, this statistic has asymptotically the chi-squared distribution with the number of degrees of freedom equal to the rank of matrix Var(b0) − Var(b1).

The model is considered appropriate because the major purpose of regression is: first, the possibility of determining the independent variables that can best explain the variation of the dependent variable. Second, recognizing whether the independent variables are still significant while the other independent variables are controlled or held constant (Omar, 2017).

ANALYSIS AND DISCUSSION OF FINDINGS

Table 2: Descriptive Statistics

	FPERF	NPLTL	LLPTL
Mean	1.661669	5.475395	-8.143991
Maximum	5.616700	33.58050	2.042400
Minimum	-9.531800	0.010000	-494.0190
Std. Dev.	1.928741	6.780054	52.50657
Observations	88	88	88

Source: Eview Version 10 Output

Table 2 revealed the data used in the study with the financial performance of quoted Deposit Money Banks under review having a mean of 1.66% indicating that the average financial performance of quoted Deposit Money Banks for the 88 observations is 1.66%, while the deviation from the mean (standard deviation) was 1.93%. The maximum value for the performance of the quoted deposit money banks as of the period of this study was 5.616700 which means that the performance of quoted deposit money banks was not more than 5.62% while the minimum performance of quoted deposit money banks was -9.53%.

Also, the non-performing loans to total loans had a mean of 5.48% indicating that on average non-performing loans to total loans for the 88 observations is 5.48%, while the deviation from the mean (standard deviation) was 6.78%. The maximum non-performing loans to total loans as of the period of this study was 33.58050 which means that the non-performing loans to total loans was not more than 33.58% while the minimum non-performing loan to total loans was 0.01%.

In a similar vein, the loan loss provision to total loans showed a mean of -8.14% indicating that on average loan loss provision to total loans for the 88 observations is 8.14%, while the standard deviation is 52.51%. The maximum loan loss provision to total loans as of the period of this study was 2.042400 which means that the loan loss provision to total loans was not more than 2.04% while the minimum loan loss provision to total loans was -494.02%.

Table 3: Correlation Matrix

	FPERF	NPLTL	LLPTL
FPERF	1	-0.168468	0.638309
NPLTL	-0.168468	1	0.045843
LLPTL	0.638309	0.045843	1

Source: Eview Version 10 Output

Table 3 explained the relationship between credit risk and the financial performance of quoted deposit money banks in Nigeria where the non-performing loans to total loans were

correlated with financial performance to the extent of 0.168468 (17%), While the loan loss provision to total loans was correlated with financial performance to the extent of 0.638309 (64%).

Table 4: Correlated Random Effects - Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.774073	2	0.6791

Source: Eview Version 10 Output

To choose between fixed and random effects models, the Hausman specification model was run. In a situation where the chi-square value was less than 5%, the fixed effects model would be more appropriate, but the random effects model would be more appropriate if the chi-square value was greater than 5%. In this case, the chi-square value was 0.6791 which was greater than 5%. This means that the random effects model was appropriate for the study.

Table 5: Regression Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.103258	0.425469	4.943387	0.0000
NPLTL	-0.048558	0.016497	-2.943467	0.0042
LLPTL	0.021576	0.001808	11.93210	0.0000
Effects Specification				
			S.D.	Rho
Cross-section random			1.346090	0.7399
Idiosyncratic random			0.798141	0.2601
Weighted Statistics				
R-squared	0.629593	Mean dependent var		0.340931
Adjusted R-squared	0.620878	S.D. dependent var		1.286873
S.E. of regression	0.792365	Sum squared resid		53.36657
F-statistic	72.23878	Durbin-Watson stat		1.649386
Prob(F-statistic)	0.000000			
Unweighted Statistics				
R-squared	0.442414	Mean dependent var		1.661669
Sum squared resid	180.4593	Durbin-Watson stat		0.487767

Source: Eview Version 10 Output

The non-performing loans to total loans had a significant effect on financial performance because the p-value was 0.0042 which was less than 5% signifying that an increase in the non-performing loans to total loans will automatically decrease financial performance to the extent of 0.048558.

Also, the loan loss provision to total loans had a significant effect on financial performance because the p-value was 0.0000 which was less than 5%, this signified that an

increase in loan loss provision to total loans will increase financial performance to the extent of 0.021576.

The coefficient of determination (R^2) is 0.629593 which means that credit risk variables used in this study explained variation in financial performance to the extent of 63% while the remaining variation was explained by other variables not captured in the model. The model is a good fit with an F-statistics p-value of 0.0000.

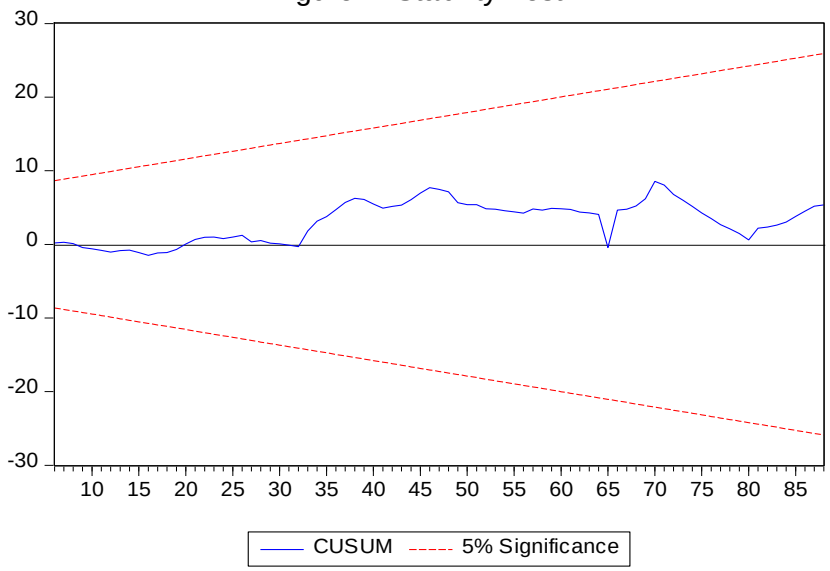
Table 6: Post-Estimation Test

Description	Probability values
Serial Correlation	
F-statistics	9.027420
P-value	0.0800
Heteroskadasticity Test	
F-statistics	1.427454
P-value	0.2456

Source: *Researcher's computation*, 2023

The Breusch-Godfrey Serial Correlation LM Test indicates that there is no autocorrelation. This is given by the F-statistic of 9.027420 and its corresponding P-value of 0.0800. The Glejser Test of Heteroskedasticity with F-statistics 1.427454 and its corresponding P-value of 0.2456 indicates that there is no problem with heteroskedasticity.

Figure 1: Stability Test



Source*: Eview Version 10 Output*

The stability of the model was checked using the CUSUM test and it shows that the model is stable as it is within the 5% boundary.

CONCLUSION AND RECOMMENDATIONS

Based on the findings of this research, the study concludes that credit risk has a significant effect on the financial performance of quoted deposit money banks in Nigeria. This means that the credit decisions made within each of the quoted deposit money banks affect their financial performance.

The study also concludes that non-performing loans to total loans have a significant effect on financial performance. This is in tandem with the findings of Jolevski (2017) who says that increasing the nonperforming loans ratio influences by reducing bank profitability. This implies that quoted deposit money banks with a higher ratio of non-performing loans to total loans will have a commensurate decrease in return on assets which will decrease the financial performance of the bank. Finally, the study concludes that loan loss provision to total loans has a significant effect on financial performance. This indicates that the ratio of loan loss provision to total loans of deposit money banks determines their financial performance. This finding is in agreement with the submission of Ahmed et al. (2015) who found that loan loss provision to total loans has a significant effect on financial performance. Based on the findings of this study, it is recommended that:

Quoted deposit money banks should improve their methods for assessing credit risk by establishing strict guidelines for loan underwriting, carrying out in-depth borrower assessments, and assessing the strength of collateral. Regular loan performance monitoring, early identification of probable delinquencies, and quick response to deteriorating loans are also essential. Banks can decrease the prevalence of non-performing loans and lessen their impact on financial performance by enhancing credit risk assessment and monitoring.

Deposit money banks should routinely review and update their credit risk models, to account for changes in market circumstances, borrower behaviour, and macroeconomic factors. Also, deposit money banks should increase the precision of credit risk assessments which involves using advanced analytics and risk management technologies (Machine Learning Algorithms, Credit Portfolio Management Systems, Stress Testing Frameworks, and Risk Scoring Models). Banks can improve their ability to predict possible credit losses, proactively detect developing risks, and make wise judgments regarding loan loss provisioning by using sophisticated models.

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