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Does credit risk management impact the financial performance of commercial banks?

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ABSTRACT

Commercial banks take deposits and lend for consumption and investment purposes. This study examined the impacts of credit risk management on the financial performance of commercial banks, using five (5) first-tier banks in Nigeria as a case study. Fifteen (15) years of panel data (2005 to 2019), extracted from the audited financial reports of five first-tier listed banks, was used for the study. All the banks used are Deposit Money Banks (DMBs) listed on the Nigerian Stock Exchange. This study used Non-performing loans (NPL) and the expected credit loss impairment provisions (ECL) as credit risk management indicators and Return on assets (ROA) as the financial performance indicator. The long-run co-integration results revealed that NPL negatively and significantly affects ROA in Nigeria, and ECL positively and substantially affects ROA in Nigeria. The findings suggest that credit risk management has insignificant positive impacts on the financial performance of commercial banks in Nigeria. The study recommends that banks undertake thorough credit risk assessments before giving out loans to ensure sound credit risk management, protect depositors' funds, avoid banks' distress, and enhance their profitability.

Introduction

Banks provide financial services to channel funds from depositors to investors for profit. Commercial banks are vital to a nation's economy (Brahmana et al., 2018; Prakash et al., 2017). Commercial banks serve as financial intermediaries to redirect funds from the surplus sector to the deficit sector profitably and sustainably. Financial stability is vital for any nation, so financial institutions should be well managed. The velocity of loan creation in an economy significantly influences the productive activities of a nation. Interest on loans and advances is a commercial bank's primary income source (Ahmed et al., 2018).

The primary cause of banks' financial problems is directly related to credit standards for borrowers (Tian, 2021; Lam et al., 2018). The primary objective of credit risk management is to reduce risk impact on business organisations, including commercial banks (Bouteille & Coogan-Pushner, 2021; Levy & Zhang, 2019). Loans account for commercial banks' credit risk exposure, as they usually account for a substantial part of their equities and financial liabilities (Kauko, 2012; Muye & Muye, 2017). Commercial banks must have an effective credit risk management system (Kimondo et al., 2012). What motivates this study is the essential role of commercial banks in mobilising financial resources for investment by providing credit facilities (including loans) to businesses and investors. Interest on loans and advances are commercial banks' primary income sources. Banks are susceptible to various risks by providing credit facilities, including liquidity and credit risks (Bolarinwa et al., 2019; Kargi, 2011).

There are several studies on the impacts of credit risk management on the financial performance of commercial or deposit money banks in Nigeria, but their findings vary. The findings of some of the studies indicated that credit risk management positively impacts the financial performance of deposit money banks in Nigeria (Nwude & Okeke, 2018; Alalade et al., 2015). Echobu and Okika (2019) study's revealed that non-performing loans and impairment loan charge-offs negatively impact the financial performance of banks.

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Gana et al. (2022) and Gambo et al. Sulaiman (2019) findings suggested that credit risk management has an insignificant effect on the financial performance of deposit money banks in Nigeria. Therefore, the literature indicates diverging findings on the impacts of credit risk management on the financial performance of commercial or deposit money banks in Nigeria. Hence, there is a research gap that this study intends to fill. Moreover, this study contributes to knowledge of the impacts of credit risk management on the financial performance of commercial or deposit money banks in Nigeria.

This study examined the impacts of credit risk management on the financial performance of commercial banks, using five (5) first-tier banks in Nigeria as a case study. The banks selected for the study include Access Bank, Guaranty Trust Bank (GTB), First Bank, Zenith Bank, and United Bank for Africa (UBA). The research objectives are to examine the relationship between non-performing loans and the financial performance of Nigerian commercial banks, and establish the relationship between expected credit loss impairment provisions and the financial performance of Nigerian commercial banks.

This paper is organised as follows: following the introduction, a second part is a literature review with conceptual, theoretical and empirical frameworks. The third part discusses the research methodology and hypothesis development. Next, data analysis and discussion of the findings are presented. Finally, this paper's conclusion and recommendations are highlighted

Literature Review

Relevant literature is discussed in this section with conceptual, theoretical and empirical frameworks. The research hypothesis is also developed.

Commercial Banks

Commercial banks take deposits and lend for consumption and investment purposes (Echobu & Okika, 2019; Elshaday et al., 2018). Commercial banks are also Deposit Money Banks (DMBs) (Agbamuche et al., 2022; Ajao & Oseyomon, 2019; Apochi & Baffa, 2022; Njoku et al., 2017). Commercial banks' lending activity gives rise to income, but they can incur losses due to non-payment of loans by borrowers (Kumar & Kishore, 2019; Suganya & Kengatharan, 2018). Commercial banks generate income through interest paid on loans by borrowers. However, commercial banks' borrowers defaulting (default risk) in repaying their loans affect their performance (Bouteille & Coogan-Pushner, 2021; Witzany, 2017). Default risk arises when borrowers default and fail to meet their obligations. Default risk may result from a poor assessment of the borrowers' creditworthiness and non-compliance with sound lending principles (Levy & Zhang, 2019; Tian, 2021).

Credit Risk Management

Sound credit risk management is essential to optimising commercial banks' performance (Siriba, 2020; Molla, 2018; Witzany, 2017). Loans are banks' prime and most apparent source of credit risk. However, other sources of credit risk exist in commercial banks' activities. Hence, banks' management must set up a credit supervision team to ensure that credit is properly maintained and administered. Effective credit risk management involves establishing a suitable environment, ensuring a sound credit granting process, and maintaining an appropriate credit administration to monitor the process and minimise credit risk exposures (Akomeah et al., 2017; Almekhlafi et al., 2016). Hence, the management of commercial banks needs to ensure the adoption and implementation of a sound risk management framework. The borrowers' credit capability can be assessed using qualitative or quantitative techniques. Borrowers' characteristics using quantitative and qualitative models by assigning numbers with the sum of the values matched up to a threshold (Werner, 2016; Echekoba et al., 2014). This method is called "credit scoring" (Tian, 2021; Levy & Zhang, 2019). Sound rating systems will minimise commercial banks' credit risk through borrowing. Counterparty failure to fulfil borrowing commitments is a significant source of credit risks for commercial banks (Afolabi, 2021; Kinyua, 2017).

Commercial banks must manage the credit risks inherent in their portfolio and operations. The credit risk management process consists of activities to manage credit risk. Credit risk management entails managing credit risk in the banking sector through credit risk identification, measurement, assessment, monitoring and control (Tian, 2021; Levy & Zhang, 2019). It involves identifying possible risk factors, evaluating their consequences, monitoring activities exposed to the identified risk factors, and instituting control measures to prevent or reduce unwanted effects (Tam, & Linh, 2020; Suganya & Kengatharan, 2018). It is essential to integrate sound credit risk management into commercial banks' strategic and operational framework (Kumar & Kishore, 2019; Kegninkeu, 2018). Commercial banks should also improve regulatory loan requirements to reduce their credit risk exposure. A thorough credit rating is necessary to assess each loan's expected loss in case the borrower becomes insolvent or bankrupt (Afolabi et al., 2020; Ajao & Oseyomon, 2019). A credit rating comprises an assessment of a borrower's creditworthiness to avoid default risk, which could lead to financial losses. The primary purpose of credit rating is to verify the borrower's default risk capacity (Apochi & Baffa, 2022; Bhattarai, 2019). The borrower's information is essential in lending decisions by credit assessment and loan managers. In addition to the personal credibility check, a credit merit appraisal must be undertaken to determine the default probability of the loan. Credit rating officers must take a balanced and objective view of the borrower's financial condition and ability to repay the debt (Al-Husainy & Jadah, 2021; Bogale, 2019; Cheng et al., 2020).

Bank Corporate Performance

Business performance measurement is multi-dimensional, depending on several factors: profitability, market value, growth, shareholder funds returns, stability and economic value-added (Bogale, 2019; Suganya & Kengatharan, 2018; Werner, 2016). The financial performance of commercial banks is essential to the informed economic decisions taken by investors, creditors, the government and other stakeholders (Garcia & Trindade, 2019; Herciu, 2017). Bank performance maximises profit and costs (Bhattarai, 2020; Almaqtari et al., 2019; Al-Homaidi et al., 2018).

Earnings per share (EPS) is vital in corporate financial reporting. Hence, EPS significantly measures commercial banks' performance (Ahmed et al., 2018; Alalade et al., 2015). As a performance measure, EPS is mandatory in corporate accounting reports in many countries, including Nigeria (Cho et al., 2022; Power, 2021). ROA represents the relationship between a bank's net income and total assets, while ROE results from the relationship between the after-tax earnings and shareholders' funds (Cho et al., 2022; Power, 2021). The net interest margin (NIM) is an essential measure of the banking industry's profit margin, symbolising the interest income to earning assets ratio (Grochulski et al., 2018).

Financial Performance

Financial performance entails measuring the results of a firm's strategies, policies and operations in monetary terms. Financial performance provides a subjective measure of how well a bank can use its assets to generate revenues (Molla, 2018; Herciu, 2017). Financial performance is measured using a firm's revenues, liabilities, and cash flow. Financial performance indicators in the form of ratios include profitability, liquidity, financial utilisation structure and investment shareholder ratio (Bouteille & Coogan-Pushner, 2021; Levy & Zhang, 2019). The measure of profitability is by gross profit margin, the amount of money made after deducting the sales/services direct cost. The operating margin lies between the gross and net profitability measures and net profit margin, including all costs. Liquidity ratios indicate the ability to meet short-term obligations. Efficiency ratios indicate how well the business assets are used (Tian, 2021; Lam et al., 2018). Financial leverage/gearing ratios indicate the sustainability of the exposure to long-term debt (Tian, 2021; Lam et al., 2018). More than two or more ratios can be used to determine a company's rate of return and the firm's sustainable growth rate. For a quoted firm, the value of the company's stock is also relevant in determining its performance.

The financial performance of a firm is reflected in its return on assets (ROA) and return on equity (ROE) (Bouteille & Coogan-Pushner, 2021; Levy & Zhang, 2019; Kodithuwakku, 2015). A company's performance can be measured using the return on assets (ROA). The ROA was computed as the net income divided by the firm's total assets, reflecting how well a company's management uses the company's investment to generate profits. Another measure of profitability is the return on equity (ROE). ROE indicates how effectively a firm uses the shareholders' funds to maximise its net profit. The higher a firm's ROA and ROE, the better the company's managerial efficiency. Conversely, the lower the company's ROA and ROE, the less efficient the firm's managerial efficiency.

Return on Asset (ROA)

Return on Assets (ROA) is a financial performance indicator. ROA is the measure of efficiency that determines how well the banks use their scarce resources to generate profits (Kiptoo et al., 2021; Muye & Muye, 2017; Kauko, 2012). ROA is widely used to compare a company's efficiency and operational performance as it looks at the returns generated from the assets financed by the company (Tian, 2021; Lam et al., 2018). It is the ratio of net income to the total asset. A higher ratio is an indication of better financial performance.

The most common measure of bank financial performance is profitability. Profitability is measured by using Return on Assets (ROA), Return on Equity (ROE) and Cost of Income Ratio (Nwosu et al., 2020; Nwude & Okeke, 2018). The study uses the Return on Assets (ROA) as the dependent variable (Nwosu et al., 2018). Return on Assets (ROA) was computed as the net profit (income) divided by the total assets. ROA measures the ability of management to acquire deposits at a reasonable cost and invest them in profitable investments (Hosna et al., 2019; John & Okika, 2019). However, banks are expected to bear some bad loans and losses in their lending activities. The bank's objective is to minimise such losses to enhance its profitability.

Expected Credit Loss Provision (ECL)

Expected Credit Loss Provision (ECL) is a non-cash expense for banks to account for future losses on loan defaults (Tian, 2021; Lam et al., 2018). ECL was used as a credit risk management proxy in this study because commercial banks operate on the assumption that a certain percentage of loans will default or become slow paying. As a result, banks make provision for a percentage as an expense when calculating their pre-tax incomes. This guarantees a bank's solvency and capitalization if a default occurs. The loan loss provision allocated each year increases with the riskiness of the loans a given bank makes (Fakhrunnas & Imron, 2019; Nelly et al., 2019; Njoku et al., 2017). A bank making a small number of risky loans will have a low loan loss provision compared to a bank taking higher risks (Malik & Shafie, 2021; Mudanya & Muturi, 2018). Banks' loan loss provision is paramount in affecting their profitability.

Credit risk management involves identifying potential risks, estimating their consequences and impacts, monitoring activities exposed to the identified risks, and implementing control measures to prevent or reduce undesirable effects (Bouteille & Coogan-Pushner, 2021; Levy & Zhang, 2019). This process applies to the bank's policies, strategies and operational framework. Non-payment

of loans by commercial banks lenders, also known as non-performing loans, increases their credit risks (Inegbedion et al., 2020; Otieno et al., 2016). Sound credit risk management reduces the level of non-performing loans. It ensures the repayment of loans by borrowers, thereby reducing the level of loan losses.

Non-Performing Loans (NPLs)

Non-payment of loans by lenders, also known as non-performing loans, increases the credit risk of commercial banks (Poyraz & Ekinci, 2019; Hamza, 2017; Otieno et al., 2016). The recovery process for non-performing loans in Nigeria is challenging. Hence, the Banks and Other Financial Institutions Act (BOFIA) 2020 introduces a credit tribunal to improve the financial system's lending landscape and loan recovery activities in Nigeria. A non-performing loan is a loan in which the maturity date has passed, but at least part of the loan is still outstanding (Ari et al., 2019). The specific definition is dependent upon the loan's particular terms. Sound and sustainable profitability are essential in maintaining the banking system's stability. If solvency is high, low profitability weakens the capacity of a bank to absorb adverse shocks and improve solvency. Hence, the need for commercial banks to reduce their credit risk, including non-performing loans. Non-performing loans measure the positive and fitness of a bank's credit risk management (Tian, 2021; Lam et al., 2018).

Financial Intermediation Theory

The financial intermediation theory of banking, propounded by Mises (1912), asserts that other people's lending characterises the banks' activity as negotiators of credit and loan givers. Banks fuel business activities by creating liquidity by borrowing from depositors with short maturities and lending to borrowers with longer maturities (Tian, 2021; Levy & Zhang, 2019). Banks profit by accepting customer deposits and lending the funds at a higher interest rate (Krugman, 2015; Werner, 2016). Commercial banks are increasingly prone to huge credit risks through their operations, including foreign exchange transactions, interbank transactions, bonds, trade financing, equities, and swaps (Siddique et al., 2022; Afolabi, 2021; Olson & Zoubi, 2017).

Hypothesis Development

In view of the literature review, the following hypothesis was developed for this study:

Ho: Credit risk management does not impact the performance of commercial banks.

Hi: Credit risk management impacts the performance of commercial banks.

Research and Methodology

This study uses a quasi-experimental research design approach. Fifteen (15) years of panel data (2005 to 2019), extracted from the audited financial reports of five first-tier listed banks, was used for the study. Five (5) first-tier banks were selected for this study, using a purposive sampling technique, including Access Bank, Guaranty Trust Bank, First Bank, Zenith Bank, and United Bank for Africa. All the banks used for this study are Deposit Money Banks (DMBs) listed on the Nigerian Stock Exchange. The population of this study consists of the nineteen listed DMBs in Nigeria's banking sector as of December 2020.

The study employs a multiple regression analysis model based on the hypothesised functional relationship between credit risk management and financial performance. Non-performing loans (NPL), expected credit loss impairment provisions (ECL), and Return on Assets (ROA) are the variables used for the study. ROA (Return on assets) is the dependent variable, while non-performing loans (NPL) and expected credit loss impairment provisions (ECL) are independent variables. The model was estimated using regression techniques (fixed effects, random effects or pooled ordinary least squares (OLS).

The model used to test the research hypothesis is stated below:

$$ROA = \beta 0 + \beta 1\ NPL + \beta 2\ ECL + \varepsilon$$

Where:

β0, β1, and β2 and are the regression constants,

Non-performing loans (NPL) indicates how banks manage their credit risk,

Expected Credit Loss (ECL) is the probability-weighted credit estimate, and

ε is purely a white noise phenomenon assumed to capture the influence of other exogenous factors capable of influencing the dependent variable.

The model was estimated using the Ordinary Least Squares (OLS) regression technique. Ordinary Least Squares regression (OLS) is a technique for estimating coefficients of linear regression equations which explore the relationship between independent and dependent variables.

Analysis and Findings

The data collected for this study is presented in Appendix 1. The data was analysed using descriptive statistics, unit root test, co-integration test and regression analysis. The descriptive data statistics are presented in Table 1.

Table 1: Descriptive Statistics

	ROA	NPL	ECL
Mean	0.023040	0.050881	-1.225267
Median	0.020963	0.037000	-0.203272
Maximum	0.059029	0.250000	0.466158
Minimum	-0.009898	0.012000	-40.81333
Std. Dev.	0.013138	0.043088	5.158444
Skewness	0.616450	2.590880	-6.710806
Kurtosis	3.787921	10.91568	49.49313
Jarque-Bera	6.690194	279.7143	7317.972
Probability	0.035257	0.000000	0.000000
Sum	1.727993	3.816055	-91.89502
Sum Sq. Dev.	0.012773	0.137384	1969.106
Observations	75	75	75

Source: Researchers' Computation using Eview 9.0

Table 1 shows the descriptive analysis of the Return on Assets (ROA), Non-performing loans (NPL), and Expected Credit Loss impairment provisions (ECL). The Mean is the average value of the series, obtained by dividing the total value by the number of observations. Table 1 shows that the Mean value of ROA is 2.3%, NPL is 5.1%, and ECL is -122.5%. The median is the middle value of the series when the values are arranged in ascending order. Table 1 shows that the Median ROA is 2.1%, NPL is 3.7%, and ECL is -20.3%. The maximum and minimum values of the data series used for this study are maximum and minimum. The maximum and minimum values for ROA are 0.06 and -0.01, NPL is 0.25 and 0.012, and ECL is 0.47 and -40.8. The standard deviation is a measure of spread or dispersion in the series. Table 1 also shows that the standard deviation for ROA is .01, NPL is .04, and ECL is 5.16.

Skewness is a measure of the asymmetry of the distribution of the series around its Mean. Positive skewness implies that the distribution has a long right tail, and negative skewness implies that the distribution has a long left tail. The skewness of a normal distribution is zero. The data are relatively symmetrical if the skewness is between -0.5 and 0.5. The data are moderately skewed if the skewness is between -1 and -0.5 or 0.5 and 1. The data are highly skewed if the skewness is less than -1 or greater than 1. The results also indicate that the skewness of ROA (0.62) and ECL (-6.71) is moderately skewed as they are less than 1, but NPL is highly skewed at 2.59 (Table 1).

Kurtosis is a measure of the combined sizes of the two tails. It measures the amount of probability in the tails. The value is often compared to the kurtosis of the normal distribution, which is equal to 3-Mesokurtic. If the kurtosis is greater than 3, the dataset has heavier tails than a normal distribution (more in the tails-Leptokurtic). If the kurtosis is less than 3, the dataset has lighter tails than a normal distribution (less in the tails-Platykurtic). The kurtosis shows that ROA (3.79), NPL (10.9) and ECL (49.9) have a leptokurtic distribution (Kurtosis > 3). In addition, ROA and NPL are positively skewed, while ECL is negatively skewed. The positive skewness means that the degree of departure from the distribution average is positive, which reveals a consistent increase from 2005 - 2019, while the negative skewness indicates a consistent decrease. Table 2 also shows that ROA (0.04), NPL (0.00) and ECL (0.00) have a low probability, indicating that the variables are not normally distributed. This is also evident from the probability of Jarque-Bera statistics. Table 2 shows the summary of the unit root test.

Table 2: Summary of Unit Root Test

Method	ROA		NPL		ECL	
	Statistic	Prob.**	Statistic	Prob.**	Statistic	Prob.**
Levin, Lin & Chu t*	-6.57686	0.0000	-7.97454	0.0000	-8.79404	0.0000
ADF - Fisher Chi-square	47.2402	0.0000	57.4878	0.0000	67.5220	0.0000
PP - Fisher Chi-square	94.6666	0.0000	90.0167	0.0000	100.155	0.0000
Order of integration	I(1)		I(1)		I(1)	

Source: Researchers' Computation using Eview 9.0

This study adopted Levin, Lin & Chu t*, ADF - Fisher Chi-square and PP - Fisher Chi-square techniques to test and verify the series' unit root property and the model's stationarity. The stationary test was conducted to avoid spurious regression problems usually associated with time series econometric modelling. This is necessary to establish whether the time series data is stationary and, if not, to establish the order of integration and check whether the variables are integrated in the same order. The basic idea behind co-integration is that if two or more series move closely together in the long run, even if they are trended, the difference between them is constant. All variables are examined and found stationary at their first difference. Table 2 shows that ROA, NPL and ECL are

stationary in their first difference form, integrated at order one (1). At this order of integration, their p-value is less than 0.05. Hence, the co-integration of all the variables is the same in their conclusion and integrated in the same order.

Hypothesis Testing

The hypothesis formulated for the study was tested using the T-test, R2 coefficient of determination and Regression Coefficient to establish the relationship level between variables.

Decision Rule: If the computed t is greater than the critical t, we reject the Ho, accept the alternative hypothesis, and vice versa.

The research hypothesis is:

Ho: Credit risk management does not impact the performance of commercial banks.

The hypothesis was tested using the following model:

$$ROA = \beta 0 + \beta 1\ NPL + \beta 2\ ECL + \varepsilon$$

Co-integration is the statistical implication of the long-run relationship between economic variables. The basic idea behind co-integration is that if two or more series move closely together in the long run, even if they are trended, the difference between them is constant. On the other hand, the lack of co-integration suggests that the variables have no long-run relationship. Table 4 shows the results of the co-integration test.

Table 3: Co-integration Test

			t-Statistic	**Prob.**
ADF			1.577435	0.02818
Residual variance			6.17E-05	
HAC variance			1.97E-05	
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RESID(-1)	-0.494643	0.136291	-3.629307	0.0006
D(RESID(-1))	-0.088499	0.132121	-0.669837	0.5054
R-squared	0.267386	Mean dependent var		0.000390
Adjusted R-squared	0.255758	S.D. dependent var		0.008219
S.E. of regression	0.007090	Akaike info criterion		-7.029904
Sum squared Resid	0.003167	Schwarz criterion		-6.963000
Log likelihood	230.4719	Hannan-Quinn criter.		-7.003506
Durbin-Watson stat	2.066409			

Source: Researchers' Computation using Eview 9.0

Table 3 results indicated that the probability (0.028) is less than 0.05, indicating no cointegration between the variables. The model estimate reveals no long-run relationship among the variables (i.e. ROA, NPL and ECL). Hence, the null hypothesis was accepted, which suggests that credit risk management does not impact the performance of commercial banks in Nigeria. Table 4 shows the regression result, using random effects, for the hypothesis model.

Table 4: Random-effects (GLS) for the hypothesis Model 1

	Coefficient	***Std. Error***	***z***	***p-value***	
const	0.0272254	0.00373070	7.298	<0.0001	***
NPL	−0.0679788	0.0208700	−3.257	0.0011	***
ECL	0.000593072	4.10759e-05	14.44	<0.0001	***

Mean dependent var	0.023040	*S.D. dependent var*	0.013138
Sum squared resid	0.010776	*S.E. of regression*	0.012150
Log-likelihood	225.3758	*Akaike criterion*	−444.7516
Schwarz criterion	−437.7991	*Hannan-Quinn*	−441.9755
rho	0.498055	*Durbin-Watson*	0.947405

Note: *'Between' variance = 0.000189945, 'Within' variance = 6.74089e-005, theta used for quasi-demeaning = 0.847973, Joint test on named regressors -Asymptotic test statistic: Chi-square(2) = 231.072, with p-value = 6.65799e-051, Breusch-Pagan test - Null hypothesis: Variance of the unit-specific error = 0, Asymptotic test statistic: Chi-square(1) = 152.937, with p-value = 3.95356e-035*

Source: Researcher computation using Gretl.

The regression analysis was based on the random effect with the Breusch-Pagan test ($p<0.05$). A random-effects model was shown because it allows for predicting something about the population from which the sample is drawn. The findings show (Table 4) that Non-performing Loans (NPL) have a negative ($\beta 1 = -0.0679788$) and significant ($p < 0.05$) effect on the Return on Asset (ROA).

Table 4 also shows that Expected Credit Loss impairment provisions (ECL) have a positive (β2 = 0.000593072) and significant (p <0.05) effect on the Return on Asset (ROA).

Discussion of Findings

This study examined the impact of credit risk management and the financial performance of commercial banks, using five first-tier banks in Nigeria as a case study.

The findings of the study suggest that:

i. Non-performing loans (NPL) have a negative (β1 = −0.0679788) and significant (p < 0.05) effect on Return on Asset (ROA). This indicates that the ROA is expected to decrease by 0.0679788 units for one unit increase in NPL while keeping all other variables constant. The result also indicated that, although NPL impact negatively on Nigerian banks' financial performance, it is a significant determinant of the ROA in the Nigerian banking sector. This is consistent with previous studies' findings that indicate that non-performing loans negatively affect banks' liquidity and profitability (Agbamuche et al., 2022; Ajao & Oseyomon, 2019; Echobu & Okika, 2019; Serwadda, 2018; Li & Zou, 2014).

ii. Expected Credit Loss impairment provisions (ECL) have a positive (β2 = 0.000593072) and significant (p < 0.05) effect on Return on Asset (ROA). This indicates that for one unit increase in ECL, the ROA is expected to increase by 0.000593072 units while keeping all other variables constant. The result also indicated that the ECL is a significant determinant of ROA in the Nigerian banking sector. The finding of this study is contrary to previous studies, which concluded that loan loss provisions and capital adequacy had a negative impact on the profitability of commercial banks (Serwadda, 2018; Nwude & Okeke, 2018; Alshatti, 2015; Gizaw et al., 2015; Olawale, 2014).

Conclusions

This study examined the impact of credit risk management and the financial performance of commercial banks, using five first-tier banks in Nigeria as a case study. The findings of this study indicate that credit risk management does not positively affect the financial performance of commercial banks in Nigeria. Commercial banks, also known as Deposit Money Banks (DMBs), take deposits and lend for consumption and investment purposes. Commercial banks' lending activity gives rise to income, but they can incur losses due to non-payment of loans by borrowers. Commercial banks generate income through interest paid on loans by borrowers. However, commercial banks' borrowers defaulting (default risk) in repaying their loans affect their financial performance. Default risk arises when borrowers default and fail to meet their obligations. Sound credit risk management and good corporate governance will reduce credit risk. Commercial banks must maintain a minimal level of ECL based on regulatory requirements to protect their depositors' investments, thus promoting the financial system's stability. It is, therefore, necessary for commercial banks to effectively control and monitor their non-performing loans (NPL).

Based on the findings, the following are recommended:

i. Banks must ensure sound credit risk management to ensure that depositors' funds are protected, avoid banks' distress, and enhance their profitability.
ii. The banks should engage in proper credit risk assessment before giving out loans and promote a reliable loan recovery process with adequate punishment for loan payment defaulters.
iii. To maximise profits and hedge against credit risk, banks should adopt an aggressive deposit mobilisation to increase credit availability and develop a reliable credit risk management strategy.
iv. Regulatory bodies should train their staff to understand the global best practices on banks' supervision. This will help financial institutions regulators to be effective in regulating and monitoring banks' to reduce credit risk.

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Appendix

Appendix 1: Return on Assets (ROA), Non-performing Loans (NPL), and the Expected Credit Loss Impairment Provisions (ECL)

Banks	Years	ROA (%)	NPL (%)	ECL (%)
Access Bank	2005	0.75%	10.83%	-151.73%
	2006	0.42%	14.96%	-158.49%
	2007	1.85%	3.05%	-26.03%
	2008	1.54%	3.67%	-21.89%
	2009	3.53%	2.20%	-4.59%
	2010	1.78%	2.43%	-22.56%
	2011	1.44%	7.03%	-100.10%
	2012	2.36%	2.43%	-16.79%
	2013	1.54%	2.70%	23.66%
	2014	2.02%	2.20%	-26.56%
	2015	2.44%	1.70%	-22.55%
	2016	2.07%	2.10%	-27.55%
	2017	1.47%	4.80%	-56.78%
	2018	1.85%	2.50%	-14.54%
	2019	1.17%	5.80%	-28.62%
GTB	2005	3.18%	2.09%	-20.40%
	2006	2.84%	3.40%	-20.33%
	2007	2.72%	2.00%	-5.51%
	2008	3.11%	1.70%	-0.44%
	2009	2.65%	11.84%	-2.94%
	2010	3.42%	6.76%	-20.52%
	2011	3.34%	3.78%	-35.61%
	2012	5.26%	3.75%	0.78%
	2013	4.49%	3.58%	-3.41%
	2014	4.19%	3.15%	-6.94%
	2015	4.14%	3.75%	-12.48%
	2016	4.85%	3.70%	-50.10%
	2017	5.62%	7.30%	-6.83%
	2018	5.90%	7.30%	-0.90%
	2019	5.65%	6.50%	-1.27%
Banks	**Years**	**ROA (%)**	**NPL (%)**	**ECL (%)**
First Bank	2005	3.23%	2.20%	-15.00%
	2006	2.97%	3.60%	-16.79%
	2007	2.41%	4.60%	-15.72%
	2008	2.10%	5.30%	-51.72%
	2009	0.07%	4.60%	-4081.33%
	2010	1.64%	7.80%	-69.60%
	2011	1.93%	2.60%	-69.26%
	2012	2.57%	2.80%	-13.84%
	2013	1.83%	2.90%	-32.98%
	2014	2.15%	2.90%	-27.91%
	2015	1.11%	5.30%	-323.05%
	2016	0.26%	14.00%	-1911.52%
	2017	1.03%	22.50%	-274.45%
	2018	1.18%	25.00%	-81.10%
	2019	0.66%	10.00%	-238.65%
Zenith	2005	2.17%	1.72%	-27.60%
	2006	1.89%	1.76%	-11.30%
	2007	1.98%	1.40%	-10.12%
	2008	2.22%	2.00%	-16.33%
	2009	1.17%	6.50%	-178.88%
	2010	1.80%	3.99%	-11.70%
	2011	1.90%	6.50%	-39.11%
	2012	3.93%	3.15%	-8.31%
	2013	2.90%	2.91%	-11.81%
	2014	2.70%	1.80%	-11.09%
	2015	2.63%	2.20%	-10.87%
	2016	2.78%	4.70%	-12.13%
	2017	3.25%	4.70%	-40.41%
	2018	3.34%	4.98%	-5.68%
	2019	3.28%	4.30%	-15.25%
UBA	2005	1.87%	3.50%	-13.99%

Table Cont'd	2006	1.35%	12.60%	-40.49%
	2007	1.80%	4.40%	-15.58%
	2008	2.63%	3.50%	-3.62%
	2009	0.92%	8.30%	-209.12%
	2010	0.15%	8.80%	-283.62%
	2011	-0.99%	3.70%	46.62%
	2012	2.45%	2.20%	-5.60%
	2013	2.10%	1.20%	-0.39%
	2014	1.71%	1.60%	-6.33%
	2015	2.15%	1.70%	-7.33%
	2016	1.87%	3.90%	-53.68%
	2017	1.45%	6.70%	-71.71%
	2018	1.14%	6.50%	-27.19%
	2019	1.52%	5.30%	-21.95%

Source: Audited and Signed Annual Financial Statements of the Selected Banks, 2005 - 2019

NB:
ROA = Net Profit (Income) /Total Assets*100%,
NPL = loan losses amount/Total Loan amount *100%,
ECL = (Impairment-ECL)/write back on Loans/ Net Profit (Income)