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Credit risk and performance of banks in Nigeria

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Abstract
The study assessed the impact of credit risk on the performance of banks with international authorisation in Nigeria. The study covered 10 banks and adopted panel data research design for the period spanning 2006 and 2018. Non-performing Loans (NPLs), Loans Loss Provision (LLP) and Loans and Advances of the banks were regressed against Return on Asset (ROA) and Return on Equity (ROE) of the banks. Both FEM and REM were used in discussing the results of the analysis. For hypothesis one, none of the explanatory variables showed significant relationship with ROA in both FEM and REM. In hypothesis two, LLP and LAA showed significant relationship with ROE in FEM while NPL and LLP showed significant relationship with ROE in REM. NPL showed a positive relationship with ROE in both FEM and REM. It was recommended that regulators should be watchful and check banks' excesses which tend to create a positive relationship between NPLs and ROE.

Keywords: Credit risk, performance of banks, Housman test

1. Introduction
Management of banks all over the world are faced with two major decision areas, namely; liquidity decision and profitability decision. The two decision areas are not mutually dependent in nature, one must happen at the expense of the other, and the two of them are inversely related. Liquidity decision is meant to keep the bank afloat to so as to meet its short term maturing obligations as they fall due while profitability decision is meant to maximise the value of the firm and shareholders' wealth.

To be liquid, a bank must hold cash and near cash instruments/securities in order to meet depositors/customers' needs for cash at short notices, but to be profitable, a bank needs to give out cash in forms of loans and overdrafts (that is, credits) in order to earn income so as to increase shareholders' wealth and attain a high market value for the bank.

As it is, increase in liquidity tends to reduce profitability; but the attainment of these two opposing objectives is the principal duty of bank management – 'a great paradox.' Increase in liquidity means less credit to customers and consequently, low profit; increase in profitability means more credit and consequently less liquidity. More credit means more credit risk and consequently, the probability of either profit or loss increases. Where the credit risk is low, there is high profit but where credit risk is high, there is low profit and/or loss. Where there is profit, the value of the bank is enhanced but where there is loss or losses the value of the bank is eroded and this has a direct consequence on the shareholders' funds and return on asset of the bank involved.

Considering the impending negative impact of credit risks, banks management and credit officers are expected to exercise all known and perceived cautions necessary to avoid losses arising from bad loans and advances. Credit risk are unavoidable by banks as their future depends on the income/earnings that help boost their operations and credit risks appear to be the greatest risk faced by banks while other risks elements are subsequent to it. It is worthy of note that credit risks are not necessarily caused by events specific to the borrowing institution but to a great extent by the activities of the economic and global environments. Like the economic melt-down of 2007 and 2008 which swept across the world and impacted financial institutions in most part of the world; the policies of a domestic economy such as Nigeria, can cause business failures and consequently, inability of those businesses to repay banks loans and advances which then leads to credit risk and finally, losses and erosion of capital (in this case, shareholders' funds). Before 2005 when there was consolidation of banks in Nigeria, the slogan 'size is might' was a sing-song in the banking sector and this slogan was believed to also lead to high profit by the "the big banks".

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Size, here, was determined by capital base and the profit declared by the banks at the end of their financial year. In those times, spurious debits (charges) were made to customers' non-performing loans accounts by banks in order to increase their profits even when there was no likelihood of recovery. Then, profits were considered more than liquidity such that even banks that declared so much profit failed supervisors'/regulators' stress test as in 2009 when eight out of twenty-five Deposit Money Banks (DMBs) failed Central Bank of Nigeria's (CBN) stress test which led to the removal of MDs/CEOs of the affected banks.

The value of a business is the worth of that business. In most cases we talk about net worth which means total assets less total liabilities, which represents the owners' contribution to the business. In banks, owners' contribution is called shareholders' funds and it consists of equity capital, reserves, share premium, and retained earnings, among others. The roles of capital in a bank include defending the bank against risk of failure, providing a base for growth and expansion, making resources available to get a new bank started, and enhancing public confidence in the management of the banks and shareholders.

This study is motivated by the recent classification and licensing of commercial banks in the country into international, national and regional banks. The classification was based on meeting specified minimum capital limit set by the Central Bank of Nigeria. In spite of this classification and the minimum capital requirements, banks still develop symptoms of distress, the most recent one was at Skye Bank plc (licensed as international bank). This development at Skye Bank caused the CBN to replace the management team of the bank in July, 2016 after the management team failed to reduce their insider credits to a minimum acceptable limit of 10 percent as directed by the CBN, within the deadlines of first, December 31, 2015 and finally June 30, 2016. The development at Skye Bank brings to the fore the fact that irrespective of how much a bank has as her capital base, credit risk can reduce their value to zero if not well managed. The performance of a bank can be measured in various ways using different parameters. In this study we chose returns on assets and equity as measures of bank performance. This is to afford us the opportunity to assess whether selected variables of credit risk affect return on assets and return on equity similarly or differently.

The driving force for this study is the fact that financial intermediation which is the core function of financial institutions/intermediaries which involves transfer of funds from surplus economic units to deficit economic units, like every other business, is faced with several risks factors, major among them is credit risk. This is so because credit is the major product of financial intermediation and credit risk is the consequence. Credit risk has a direct effect on the value and performance of the financial intermediaries and can erode the capital base of the banks if not mitigated. Coupled with the current licensing of banks in Nigeria, and the fact that some banks fragrantly violate the prudential guidelines by mismanaging credit such that even the international banks have started losing their licences, it becomes necessary to reawaken bank management to the fact that lending should be based on need and not frivolity, personal interest or political connection/expectation. Also, that capital is a buffer that can be weakened by bad loans

and where the buffer is weak it will lose the potency of reducing shocks to the system and hence the risk of losing business or being out of business.

The objective of the paper, therefore, is to examine the effect of credit risk on banks profitability. Credit risk in the paper was measured by Loans Loss Provisioning (LLP), non-performing loans (NPL) and Loans and Advances (LAA) while banks performance was measured by Return on Equity (ROE) and Return on Asset (ROA). With ROE and ROA, two hypotheses were formulated and tested.

The paper is divided into five sections of which this introduction is one. Section two embodies literature review, section three takes care of the methodology adopted in the study while in chapter four. The researchers present and discuss the results of the data analysis. In chapter five, conclusion and recommendations in line with findings of the study were presented.

2. Literature review
2.1 Concept of Credit Risk
Credit risk is an example of financial risk which arises when the possibility of repaying loans or bonds is impaired as a result of specific or general events that affect the expected cash flow that could have aided the repayment by borrowers to banks or any other financial institutions. Credit risk is also known as default risk. This means a situation where a borrower fails to fulfil his obligations to the lender either in part or in full. According to Bouteille and Coogan-Pushner (2012) [1] as cited in Al-Eitan and Bani-Khalid (2019) [2], credit risk is "*the possibility of losing money due to the inability, unwillingness, or untimeliness of counterparty to honor a financial obligation*". Besides, Basel Committee (1999) [3] identified credit risk as the uncertainty factors that expose the inability of a party to a contract to meet its maturing obligations to the bank in line with the agreed terms (Brown & Moles, 2008) [4]. Bessis (1998) [5] sees credit risk as sudden negative effect of indicators of financial soundness on the profitability level of banks.

A lot of factors that are either specific or general in nature interact to bring about credit risk. The specific factors are internal to the firm (borrower) involved and can be managed through credit portfolio diversification whereas the general factors (that is, macroeconomic factors) are caused by the changes in the economy such that every participant in the economy is affected.

Asllanaj (2018) [6] opined that banks may suffer from credit risk as a result of four factors which include:
1. Inadequate management practices which lead to bad debts;
2. Inefficient and ineffective mechanisms for reducing bad debts;
3. Insider abuses leading to hard core credits, and
4. Poor credit management techniques.

2.2 Theoretical Review
There are so many theories that can conveniently explain credit risk or bank lending. Among them are the following theories:

2.2.1 The Credit Risk Theory: Liu, Mirzaei and Vandoros (2014) [7] defined credit risk as the risk of suffering a financial loss as a result of dwindling creditworthiness in a

counterparty to a financial transaction. Credit risk theory was introduced in 1974 by Robert Merton in his theory of default or default model. In the model, he characterised the company's equity as a call option on the assets of the company. There are two methods of modelling credit risk – the structural approach and the intensity-based approach. Clifford V. Rossi leveraged on Merton model to develop three approaches to measuring credit risk which are; the concept of credit spreads, credit portfolio management and loss distribution generated through Monte Carlo simulation.

2.2.2 Finance Distress Theory: A firm enters the state of financial distress when the firm's business deteriorates to the point where it cannot meet its maturing obligations (Baldwin and Scott, 1983) [8]. The distress will lead to violation of debt payments and failure or reduction of dividends pay-outs. The inability of firms to meet their contractual debt obligations is the key factor in identifying firms in financial distress.

2.2.3 Asymmetric Information Theory: The works of George Akerlof (1970) [9], Michael Spence (1973) [10] and several works of Joseph Stiglitz lend much credence to the argument of asymmetric information. There are three problems associated with information asymmetry. Firstly, different information is available to different parties to a deal. Secondly, perfect information is not always available to everyone. Thirdly, other parties to a transaction may be privileged to 'insider' information. The lopsided information can lead to adverse selection and moral hazard. Saunders and Cornett (2008) [11] posited that "the potential loss financial intermediary can experience from lending suggests that they need to monitor and collect information about borrowers whose assets are in their portfolios and to monitor those borrowers over time". Accordingly, the ability of management of banks to monitor their borrowers efficiently and the effectiveness of their credit risk management strategies have direct impact on the return and risks of the loan portfolio.

2.2.4 The Anticipated Income Theory: In 1944, H. V. Prochnow developed the Anticipated Income Theory. By the theory, banks are expected to plan the liquidation of their loans from the expected inflows from the borrower's existing business. This means that banks get repayment of their loans through future incomes of the borrower in bits instead of paying the whole loan sum and interest at once on maturity.

2.3 Empirical Review
Kargi (2011) [12] evaluated the impact of credit risk on the profitability of banks in Nigeria with data obtained from annual reports and accounts of the banks studied for the period spanning 2004 and 2008 and found that credit risk management has a significant impact on the profitability of banks in Nigeria. Also, it was revealed that the level of non-performing loans, loans and advances and deposits negatively influenced the profitability of banks and consequently expose them to great risk of illiquidity and distress. Kolapo, Ayeni, Kolade and Ojo (2012) [13] studied the effect of credit risk on the performance of commercial banks in Nigeria for the period covering 11 years using

panel model approach on the selected five commercial banks. Return on Asset (ROA) was used as dependent variable while Non-performing loan to loan and advances (NPL/LA) ratio, Total loan and Advances to Total deposit (LA/TD) ratio and loan loss provision to classified loans (LLP/CL) ratio were independent variables. According to them, the results showed that the impact of credit risk on the performance of banks does not change over time across the banks selected for the study. As expected, their findings showed that banks profitability reduces as loan loss provisions and non-performing loans increase. Meanwhile, profitability of banks increases as the banks continue to grant more loans and advances.

The impact of credit risk and capital adequacy on banks financial performance in Nigeria was examined by Ogboi and Unuafe (2013) [14]. They used time series and cross sectional data from 2004-2009 obtained from selected banks annual reports and accounts in Nigeria. The sample was selected through a purposive sampling technique. Panel data modeling approach was applied to estimate the relationship that exists among loans and advances (LA), loan loss provisions (LLP), capital adequacy (CA) and non-performing loans (NPL) and return on asset (ROA). The findings showed that financial performance of banks are positively impacted by capital adequacy and sound credit risk management whereas loans and advances showed an inverse relationship with profitability of banks during the period of investigation.

Marshal and Onyekachi (2014) [15] investigated the effect of credit risk and banks' performance in Nigeria for a period of 15 years (i.e. 1997 – 2011). Using panel data modeling technique, the result showed that banks performance (LogROA) has a direct relationship with ratio of non-performing loans to loan and advances (LogNPL) and ratio of loan and advances to total deposit (LogLA). They concluded that banks should increase their loans and advances in order to increase their interest income and hence their performance.

Kajola, Babatunji, Olabisi and Babatolu (2019) [16] studied 10 deposit money banks in Nigeria between 2005 and 2016. They used Capital Adequacy Ratio, Non-performing Loan to total Deposit Ratio (NPLDR) and non-performing Loan to total Loan Ratio (NPLLR) as proxy for credit management while Return on equity (ROE) and Return on asset (ROA) were used as proxy for financial performance. Panel data modeling approach was employed in data estimation. It was found that all the three credit risk parameters have a significant relationship with ROA and ROE. They recommended that management of banks should develop robust credit policies in order to effectively assess their customers' credit worthiness.

Taiwo, Ucheaga, Achugamonu, Adetiloye, Okoye and Agwu (2017) [17] studied the measurable effect of credit risk management on Deposit Money Banks' (DMBs) performance in Nigeria and the growth of bank lending over the period of 17 years (1998- 2014). Secondary data obtained from CBN Statistical bulletin 2014 and World Bank (WDI) 2015 were used in the study. Analysis of data was done using multiple regression technique of ordinary least square. Their findings revealed that credit risk management does not have a significant impact on the growth of total loans and advances by DMBs in Nigeria.

Investors and depositors' confidence in banks can be boosted by sound credit management practices.

Nwanna and Oguezue (2017) [18] investigated the relationship existing between profitability (ROA) and credit management of Deposit Money Banks (DMBs) in Nigeria from 2006 to 2015. Ordinary Least Square multiple regression technique was employed in analyzing the data. The study found that loan loss provision and loans and advances have positive and non-significant effect on profitability, while non-performing loan has a non-significant inverse relationship with profitability. Accordingly, it was concluded that financial strength of the DMBs can be heightened through sound credit management.

Al-Eitan and Bani-Khalid (2019) [2] examined the impact of credit risk on the financial performance of listed Jordanian commercial banks for the period between 2008 and 2017. Both fixed and random-effect models of Panel data study technique and GLS method were employed to determine the impact of performance of Jordanian listed banks. It was revealed that credit risk has a negative and significant impact on return on assets (ROA) and return on equity (ROE). Furthermore, the results indicated that credit risk proxied with the ratio of doubtful debts to total loans, non-performing loans and loan losses to total loans has a negative and significant impact on ROA and ROE. Total deposits and bank size have positive and significant impact on financial performance of the banks.

Folajimi and Dare (2020) [19] using *ex post facto* research designed, appraised the effect of credit risk on financial performance of deposit money banks in Nigeria. They selected a sample of 13 out 19 deposits money banks (DMBs) listed on the Nigeria stock exchange as at December 31, 2018 and considered the period covering 2006 and 2018. Return on capital employed (ROCE) was used as the dependent variable. Independent variables representing credit risk were non-performing loans, loan loss provisions, loan to deposit ratio and capital adequacy ratio while bank size was used as the control variable in the study. It was found that credit risk had a positive significant effect on financial performance of the DMBs. It was recommended that formulation of stringent credit policy and designing and maintaining a robust credit management strategy and framework by management of banks would reduce nonperforming loans and default rate and consequently improve their performance level.

In Kenya, Muriithi, Waweru and Muturi (2016) [20] evaluated the effect of credit risk on financial performance of commercial banks for the period beginning from 2005 to 2014. Capital to risk weighted assets, asset quality, loan loss provision, loan and advance ratios represented credit risk while financial performance was proxied with return on equity (ROE). Forty-three (43) commercial banks registered in Kenya by year 2014 were studied. Panel data regression technique was adopted in the study. Fixed effects estimation and generalized method of moments (GMM) were used to estimate the model. They also carried out pairwise correlations between the variables.

Abiola and Olausi (2014) [21] investigated the impact of credit risk management on the performance of commercial banks in Nigeria. Data of seven commercial banking firms' for the period spanning 2005 and 2011 were used. The model was estimated using panel data regression technique.

Performance of commercial banks was proxied with Return on Equity (ROE) and Return on Asset (ROA) while Capital Adequacy Ratio (CAR) and non-Performing Loans (NPL) were used as indicators of credit risk management. it was found that credit risk management has a significant impact on the profitability of commercial banks in Nigeria.

Oduro, Asiedu and Gadzo (2019) [22] attempted to identify and estimate the effects of bank credit risk on corporate financial performance using financial data from banks on the Ghana Stock Exchange for a period of 15 years. They adopted 2SLS method of regression and it was revealed that operating efficiency, net interest margin and capital adequacy are negatively related to credit risk. On the other hand, financing gap and bank size tend to relate positively with credit risk. Besides, annualized changes in inflation tends to affect credit risk positively. As expected, it was observed that corporate financial performance is negatively affected by increase in bank credit risk and this is consistent with Basel accord. Banks should be careful in handling its credit risk issues.

Poyraz and Ekinci (2019) [23] analysed the impact of credit risk on 26 commercial banks in Turkey. The analyses were done based on three categories of banks ownership in the country comprising state-owned, privately owned and foreign owned banks. Panel data research design was employed using Return on Assets (ROA) and Return on Equity (ROE) as explained variables while Non-performing loans (NPLs) were used as explanatory variables. Results of analyses showed that NPLs relate negatively with both ROA and ROE. It was recommended that banks should consciously intensify efforts at managing credit risk by controlling and monitoring NPLs in order to increase profitability.

Bhattarai (2019) [24] investigated the effect of credit risk on financial performance of commercial banks in Nepal for the period between 2001 and 2016. Management quality ratio (MQR), NPL ratio, credit to deposit ratio, Capital Adequacy Ratio (CAR) and sensitivity to market risk were used as independent variables while ROA was used as the proxy for financial performance. Results of the analyses revealed that all the variables except MQR exhibit inverse relationship with ROA. Meanwhile, NPLR, CAR and MQR have significant relationship with ROA whereas risk sensitivity and credit to deposit ratio have no significant relationship with financial performance of the commercial banks in Nepal.

Isedu and Erhabor (2021) [25] inquired to know whether financial risks have any effect on the performance of DBMs in Nigeria. The study considered 18 DMBs listed on the floor of the Nigerian Stock Market. The study spanned 19 years. Panel data study design was adopted in estimating the model of the study. Liquidity risk, credit risk, operational risk, market risk and bank size were used as variables of the study. Results obtained from the data analysis revealed that financial risk proxied by credit risk (NPLs and LLP) does not have any significant relationship with financial performance (ROA) of DMBs in Nigeria. Also, liquidity risk was found to be a significant determinant of DMBs' performance in Nigeria.

3. Methodology
Panel data approach was employed in the study to analyze the cross-sectional data of ten (10) commercial banks in Nigeria. *Ex post facto* research design was adopted in the

study. The population of the study included twenty-seven (27) DMBs that operated in Nigeria as at 31st December, 2018. Out of the 27 DMBs, 22 of them are commercial banks, 4 are Merchant Banks while one (1) is non- interest bank. Among the commercial banks, ten (10) of them were licensed as "International Banks", while other commercial banks were licensed either as Regional banks, National banks or non-interest bank.

The study concentrated on the banks with international authorization. The different categories of licenses were determined by attainment of certain minimum capital base. Banks with international authorization must have a minimum of N100billion as its capital base.

The ten banks are: Access bank, Diamond bank, FCMB Plc, Fidelity bank, and First Bank, GT Bank, Skye Bank, United Bank for Africa, Union bank, and Zenith bank. The 10 banks control more than half of customers' base, deposits and even extend more than half of the total risk assets in the country.

A blend of purposive and judgmental sampling technique was employed in sample selection. Data of the selected banks were obtained exclusively from their published Annual Reports and Accounts for the period spanning 2006 and 2018. The data are secondary in nature and are annual financial data.

3.4 Period Covered: The choice of year 2006 was not coincidental but deliberate as the researchers want to have a post-consolidation view of banks with the highest capital base in the country.

In specifying models for the study, five variables were chosen for the study. They were:

A. Return on Asset (ROA) and Return on Equity (ROE) as dependent variables, and

B. Non-performing Loans (NPL), Loan Loss Provisioning (LLP), and Loans and Advances (LAA) as independent variables.

Two models were specified for the study as follows:

ROA = f(NPL, LLP, LAA) ………….. Equation 3.1

ROE= f(NPL, LLP, LAA) ………….... Equation 3.2

Where
ROA = Return on Asset
ROE = Return on Equity
NPL = Non-performing Loans

LLP = Loan Loss Provisioning
LAA = Loans and Advances

The above functional relationship can be written explicitly as follows:

$ROA = \beta_0 + \beta_1 NPL + \beta_2 LLP + \beta_3 LAA + \mu$………. Eq (3.3)

$ROE = \yen_0 + \yen_1 NPL + \yen_2 LLP + \yen_3 LAA + \text{€}$ ……….. Eq (3.4)

Where
β_0 = Constant
$\beta_1 … \beta_3$ = Coefficients of independent variables for equation 3.3
$\yen_0$ = Constant, and
$\yen_1 .. \yen_3$ = Coefficients of independent variables for equation 3.4
μ and € = Error terms for equations 3.3 and 3.4, respectively.

Table 1: A Priori Expectations of the Study

Variables	Expected Relationship with ROA	Expected Relationship with ROE
NPL	-	-
LLP	-	-
LAA	+	+

Source: Researcher's conceptualization

In line with existing theories, NPL and LLP are expected to exhibit a negative relationship with both ROA and ROE, while LAA is expected to relate positively with both ROA and ROE.

3.2: Hypotheses of the Study
3.2.1: There is no significant effect of NPL, LLP and LAA on ROA of International Banks in Nigeria.
3.2.2: There is no significant effect of NPL, LLP and LAA on ROE of International Banks in Nigeria.

4. Results and Discussions
This section of the study presents the outputs of various analyses and also discusses them in line with economic realities.

4.1: Descriptive Statistics

Table 2: Results of Descriptive Statistics

	ROA	ROE	NPL	LLP	LAA
Mean	2.173615	15.59608	10180360	5427937	2.02E+08
Median	1.695	11.505	191706.5	43245.5	1411091
Maximum	24.24	443	1.20E+08	88164794	2.14E+09
Minimum	0.12	0.44	3699	227	84201
Std. Dev.	2.589103	38.53009	21723049	12224763	3.99E+08
Skewness	5.40351	10.6145	3.126955	3.617081	2.768378
Kurtosis	43.06895	118.2862	13.5067	20.13542	11.71664
Jarque-Bera	9329.192	74433.52	809.8029	1873.927	577.6085
Probability	0	0	0	0	0
Sum	282.57	2027.49	1.32E+09	7.06E+08	2.62E+10
Sum Sq. Dev.	864.7458	191509.2	6.09E+16	1.93E+16	2.05E+19
Observations	130	130	130	130	130

Source: Author's computation using Eviews 9

Table 4.1 shows the results of descriptive statistics of the data used in the study. It is clear in the Table that Loans and Advances (LAA) has the highest mean value of N20.2Bn followed by Non-Performing Loans (NPL) with the value of N10,180,360 and Loans Loss Provisioning (LLP) with the value of N 5,427,937. The mean values of ROA and ROE were expressed in percentage. This follows that the 10 banks studied grants average of N20.2Billion loans annually for the period of the study (2006 – 2018) and that average NPLs for the 10 banks amounted to N10.1 million annually while N 5.4 million was provided for the losses between 2006 and 2018. Meanwhile, the maximum values for LAA, NPL and LLP are N214 billion, N 120 billion and N 88.2 million, respectively. Average returns on equity and asset of the 10 banks are 15.60% and 2.17%, respectively. The maximum returns on equity and asset are 443% and 24.24%, respectively. The minimum returns on equity and assets are 0.44% and 0.12%, respectively. Each of the 10 banks contributed data for 13 years amounting to a total of 130 observations used in the study. The study used balanced observations for each of the test.

4.2: Correlation Analysis

In order to ascertain how the independent variables correlated among themselves, correlation analysis was carried out. Results in Table 4.2 show that all the independent variables exhibit positive relationship among themselves and their coefficient are within acceptable limits. It is worthy of note that all the variables correlate negatively with ROA and that only LLP has a negative relationship with ROE while NPL and LAA correlate positively.

Table 3: Correlation Matrix

	ROA	**ROE**	**NPL**	**LLP**	**LAA**
ROA	1				
ROE	-0.020	1			
NPL	-0.157	0.379	1		
LLP	-0.134	-0.044	0.390	1	
LAA	-0.130	0.137	0.475	0.711	1

Source: Author's computation using Eviews 9

4.3 Unit Root Test

Table 4: Results of Levin, Lin & Chu t* Unit Root Test

Variables	T-statistic @ Intercept & Trend	Prob.	Order of Integration	Remark
ROA	-2.51216	0.0060	I(0)	Level
ROE	-5.99213	0.0000	I(0)	Level
NPL	-603.483	0.0000	I(0)	Level
LLP	-10.092	0.0000	I(1)	1st Difference
LAA	-9.8725	0.0060	1(1)	1st Difference

Source: Author's computation using Eviews 9

In Table 4.3, ROA, ROE and NPL are stationary at Level, that is I(0) whereas LLP and LAA are stationary at first difference, that is, I(1). With these results, the variables are free from Unit Root and are suitable for further processes.

4.4 Cointegration Test

To ascertain whether the variables have long run relationship among themselves in panel data study, the Kao Residual Cointegration Test, one of the methods usually employed was used in the study.

Table 4.4: Kao Residual Cointegration Test Results for ROA

Kao Residual Cointegration Test Series: ROA NPL LLP LAA User-Specified lag length: 1 Newey-West automatic bandwidth selection and Bartlett kernel				
			t-Statistic	Prob.
ADF			-3.178240	0.0007
Residual variance			8.033479	
HAC variance			7.514975	

Source: Author's computation using Eviews 9

In Table 4.4, the t-statistic and probability value are -3.178240 and 0.0007, respectively. Since the p-value is less than 0.05, there is cointegration among the variables in the study. The existence of cointegration leads to the rejection of the null hypothesis of no cointegration.

Table 5: Kao Residual Cointegration Test Results for ROE

Kao Residual Cointegration Test Series: ROE NPL LLP LAA Null Hypothesis: No cointegration				
			t-Statistic	Prob.
ADF			-7.257923	0.0000
Residual variance			1643.180	
HAC variance			1569.807	

Source: Author's computation using Eviews 9

In the same vein, in Table 4.5, the t-statistic and probability value are -7.257923 and 0.0000, respectively. Since the p-value is less than 0.05, the null hypothesis of no cointegration is rejected. Accordingly, there is cointegration among the variables of the study.

4.5 Panel Least Square Regression Tests

In panel data study, results for discussion are usually obtained through pooled effects, random effects and fixed effects models. With pooled OLS model, all 130 observations were pooled and a general regression was estimated. In doing this, the properties of the cross-sectional

and time series data used are neglected and as such camouflaged the individuality of the data (Gujarati, 2013) [26]. With fixed effect model, all 130 observations were pooled but each cross-sectional unit was allowed to have its own fixed intercept value. The intercept here does not vary over time (that is, it is time-invariant). With random effect model, the assumption is that the intercept values are not fixed but random (Gujarati, 2013). In random effect model, the common intercept represents the mean value of all the cross-sectional intercepts. Meanwhile, in panel data research, fixed effect and random effect models are the two main approaches to analyzing both time series and cross-sectional data. To determine which of the two models is the appropriate model to use in the study, Hausman test was carried out. The Hausman test relies on the p-value of the Chi-Square statistic. If the p-value is less than 5%, then fixed effect model (FEM) is appropriate for the study but if it is greater than 5%, it means that random effect model (REM) is appropriate for the study. In this study, t-statistics and p-values from both FEM and REM tests results are used in explaining the relationship between the dependent variables and the independent variables.

Table 6: Effect of NPL, LLP and LAA on ROA

Fixed Effect Model			
Variable	Coefficient	t-statistic	Prob.
NPL	-9.59E-09	-0.703991	0.4828
LLP	-2.73E-09	-0.104262	0.9171
LAA	4.45E-10	0.462913	0.6443
C	2.196307	7.279638	0.0000
R-Squared	18%		
Adj R-Squared	10%		
F-Statistic	2.146714		
Prob(F-Stat)	0.018797		
Durbin-Watson	1.465		

Source: Author's computation using Eviews 9

Table 7: Effect of NPL, LLP and LAA on ROA

Random Effect Model			
Variable	Coefficient	t-statistic	Prob.
NPL	-1.27E-08	-1.006777	0.3160
LLP	-8.54E-09	-0.331089	0.7411
LAA	6.93E-11	0.078767	0.9373
C	2.335111	5.746492	0.0000
R-Squared	1%		
Adj R-Squared	-1%		
F-Statistic	0.476807		
Prob(F-Stat)	0.698989		
Durbin-Watson	1.373		

Source: Author's computation using Eviews 9

From the results of Fixed Effect Model in Table 4.6, the explanatory variables determine10% of the variations in ROA. The model fits the data as evidenced by the F-statistic of 2.146714 and Prob.(F-stat) of 0.018797. The Durbin-Watson statistic of 1.5 shows the absence of serial correlation in the model. It is evidenced from the t-statistics and p-values of the explanatory variables that NPL, LLP and LAA do not have any significant effect on ROA. With the results of Random Effect Model in Table 4.7, the combined impact of NPL, LLP and LAA can not cause any changes in the dependent variable (ROA). Besides, none of

the explanatory variables in the REM exhibits a significant relationship with ROA.

Table 8: Effect of NPL, LLP and LAA on ROE

Fixed Effect Model			
Variable	Coefficient	t-statistic	Prob.
NPL	7.74E-07	3.90533	0.0839
LLP	-9.04E-07	-2.37084	0.0002
LAA	2.46E-08	1.757892	0.0194
C	7.655112	1.743468	0.0814
R-Squared	22%		
Adj R-Squared	14%		
F-Statistic	2.689979		
Prob(F-Stat)	0.003110		
Durbin-Watson	1.604		

Source: Author's computation using Eviews 9

Table 9: Effect of NPL, LLP and LAA on ROE

Random Effect Model			
Variable	Coefficient	t-statistic	Prob.
NPL	7.59E-07	4.584022	0.0000
LLP	-1.04E-06	-2.823264	0.0055
LAA	1.62E-08	1.374154	0.1718
C	10.23853	2.820189	0.0056
R-Squared	20%		
Adj R-Squared	18%		
F-Statistic	10.46274		
Prob(F-Stat)	0.000003		
Durbin-Watson	1.581		

Source: Author's computation using Eviews 9

In Table 4.8, the explanatory variables of FEM determine 14% of the changes in ROE. F-Statistic of 2.689979 shows the strength of the model and its p-value of 0.003110 shows that the model fits the data. T-statistic and p-values revealed that only LLP and LAA have significant effect on ROE. Durbin-Watson statistic of 1.604 revealed the absence of autocorrelation in the model. Also, the results of REM as depicted by Table 4.9 show that the explanatory variables determine 18% of changes in ROE. F-Statistic of 10.46274 and its p-value of 0.000003 confirm that the model is strong and fits the data, respectively. Durbin-Watson statistic of 1.581 revealed the absence of autocorrelation in the model. With REM, NPL and LLP have significant effect on ROE. This is confirmed by their p-values of 0.0000 and 0.0055, respectively.

4.6 Test of Hypotheses
Two hypotheses formulated for the study in the null form were;
Hypothesis One: There is no significant effect of NPL, LLP and LAA on ROA of International Banks in Nigeria, and
Hypothesis Two: There is no significant effect of NPL, LLP and LAA on ROE of International Banks in Nigeria.
The hypotheses were tested using t-statistic and p-values of t-statistic for individual variables and F-statistic and p-values of F-statistic for the overall models (that is, FEM and REM). The basis for decision making is to reject the null hypothesis when the p-values of both the t-statistics and F-statistic are greater than 0.05 and to accept the null hypothesis when the p-values of both the t-statistics and F-

statistic are less than 0.05. The results needed for hypotheses testing are shown in Tables 4.6 and 4.7 for Hypothesis One and Tables 4.8 and 4.9 for Hypothesis Two.

Hypothesis One
From Table 4.6, using t-statistics of both FEM and REM, hypothesis one is accepted because the p-values of t-statistic of all the variables are greater than 0.05 (that is, not significant). Considering the p-values of F-statistic of the two models, only FEM with p-value of 0.018797 and R^2 of 18 per cent appear to be a more suitable model for hypothesis number one and it can explain only 18 per cent of variations taking place in Return on Asset (dependent variable). The FEM shows that both NPL and LLP exhibit negative and non-significant relationship with ROA while Loans and Advances (LAA) exhibit a positive relationship with ROA, all in line with the expectations of the study and existing literature.

Hypothesis Two
Both FEM and REM indicate that two variables each have significant relationship with ROE. In FEM, Loans and Advances (LAA) exhibits a positive significant relation with ROE while Loans Loss Provisioning (LLP) exhibit a negative and significant relationship with ROE. On the other hand, Non-performing Loans (NPL) and LLP exhibit positive and negative significant relationship with ROE, respectively. For both models, the probability of their F-statistic are less than 0.05. Consequently, the hypothesis that 'there is no significant effect of NPL, LLP and LAA on ROE of International Banks in Nigeria' is hereby rejected and the alternate hypothesis which states that, 'there is significant effect of NPL, LLP and LAA on ROE of International Banks in Nigeria is accepted.

4.7: Hausman Test
Hausman Test is usually carried out to select the more appropriate model between Fixed Effect Model and Random Effect Model. Tables 4.10 and 4.11 present the results of the test carried out in the study.

Table 10: Result of Hausman Test for Hypothesis One

Correlated Random Effects - Hausman Test Equation: Untitled Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.722249	3	0.6320

Source: Author's computation using Eviews 9

Table 4.11: Result of Hausman Test for Hypothesis Two

Correlated Random Effects - Hausman Test Equation: Untitled Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.005944	3	0.5712

Source: Author's computation using Eviews 9

Results of Hausman Tests shown in Table 4.10 and 4.11 show that Random Effect Models were found more appropriate for the two hypotheses. However, it became quite obvious that REM which was adjudged more

appropriate for hypothesis one was not found appropriate as such from its F-statistic value and even the p-value of the F-statistic as compared to the F-statistic and p-value of the F-statistic in the FEM. This inconsistency prompted the researcher to discuss the results of the analysis using both models. This inconsistency also became the major limitation of this study.

4.8: Discussion of the Findings
Following from the results of the analyses earlier presented, with both FEM and REM in hypothesis number one, all the variables were correctly signed but none of them showed a significant relationship with ROA. This finding is supported by the findings of Kelapo *et al.* (2012) [11], Marshal and Onyekachi (2014) [13], Poyraz and Ekinci (2019) [20] and Isedu and Erhabor (2021) [22]. Also, the fact that NPL exhibited a significant positive relationship in REM of hypothesis two tends to support hitherto practice of some banks that use to debit delinquent customers' accounts for their commission and other charges in order to declare jumbo profits not minding the status of the customers' account. Knowing that when banks declare more profits, investors and other stakeholders will count that for management efficiency and this has a positive impact on the market value of the banks. Theoretically, NPL and LLP are supposed to relate negatively with ROE as in Bhattarai (2019) [21] and Poyraz and Ekinci (2019) [20].

5.0: Conclusion and Recommendation
Loans and Advances are the major source of income to banks. When customers are unable to keep to the terms and conditions of loans and advances, the default or credit risk materializes. Default risk means either the principal or the loan's interest or both have not been repaid as agreed. The default leads to Non-Performing Loans and consequently, Provision for Loan loss. Both non-performing loans and provision for loans loss (es) lead to loss of income by the bank concerned. In the study, it was revealed that non-performing loans exhibit a non-significant positive relationship with return on equity of banks with international authorization when analysed with Fixed Effect Model and also a significant positive relationship with return on equity of banks with international authorization when analysed with Random Effect Model. This calls for intense regulation to avoid any imminent financial or bank crises in the country.
It is recommended that regulators (Central Bank of Nigeria and Nigeria Deposit Insurance Corporation) should be watchful and check banks' excesses in taking charges from delinquent accounts which tends to create a positive relationship between NPL and ROE.
The seeming inconsistency of Hausman test in deciding the appropriate model for the study appears to be the major limitation of the study. It is recommended that similar study on banks with regional and national authorizations be conducted in order to provide comparable findings for future decision making.

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