



## Credit Risks and Financial Performance of Nigerian Banking Industry

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### Abstract

Banking businesses worldwide are often bedeviled with the risk of providing credit facilities to borrowers. The performance, in terms of economic and financial stability of these banks is adversely affected by credit risks. Deposit Money Banks (DMBs) in Nigeria are not left out of this challenge. It is essential to understand how credit risks impact the financial performance of DMBs so as to mitigate and control its unfavorable effect on banks' performance. The study examined the impact of credit risks on the financial performance of listed DMBs in Nigeria, from 2006-2017. Data for the study were secondary in nature and gotten from audited financial reports of all the 15 listed DMBs in Nigeria as on 31st December, 2017. Regression tools were employed for data analysis, and the results show that non-performing loans and impairment loan charge-off have negative and significant impact on the financial performance of banks. The impact of capital adequacy on financial performance is negative but statistically insignificant. The study recommends that DMBs should improve their risk management strategy to reduce the increase of default loans. In addition, a short-term periodic review of prudential guidelines and other regulations governing the issuance of credit facilities by DMBs is advocated, so that current realities and intrigues about credit risks will be captured in policies.

**Key words:** Non-performing Loans, Capital Adequacy, Loan Impairment Charge-off, Return on Assets and Deposit Money Banks

**JEL Classification:** G19, G20 and G21

**Paper Classification:** Research Paper

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### Introduction

Financial institutions play a very important and prominent role in providing finance and credit facilities to drive businesses for the development of economies of nations. Deposit money banks (DMBs) remain a key player in the performance of this role. These banks by virtue of their business substance are able to mobilize funds from various sources especially from depositors and savers, and channel the funds gathered to sectors of the economy that need them to finance their

operations. The banks, therefore, serve as mediators between depositors (savers) and borrowers by facilitating the provision of credit from the deposits collected to fund borrowers' investments. This function of DMBs is very critical to its survival and it is believed to be an integral aspect of its income-generating activity (Kargi, 2011)

The provision of credit by DMBs contributes largely to its income base through interest charges paid by borrowers. Even though it accounts for one of the main sources of income for DMBs, the underlying risks of providing credit remain an issue affecting the performance of DMBs. These risks could be traced to the poor conception of the assessment of creditworthiness of borrowers and non-adherence to lending principles, to the point where the risk is consummated by the actual default of the terms of repayment by borrowers. Thus, according to the Basel Committee on Banking Supervision (2001), the likelihood of partially or wholly losing an outstanding loan due to credit events makes credit financing volatile. When a loan that is due for payment becomes outstanding for a certain period of time, it becomes a non-performing loan, and these mature but unrecovered loans are used as one of the measures of assessing the credit risk of DMBs.

Non-performing loan profile in the DMBs in Nigeria is rising, and this has been identified as a disturbing trend. According to Etale, Ayunku and Etale (2016), the increasing portfolio of non-performing loans led to the introduction of the prudential guideline by the Central Bank of Nigeria (CBN) in 2010. These guidelines by the apex bank in Nigeria mandated DMBs to continually review their loan portfolios from time to time. This should be done at least once every three months, to enable DMBs to spot any adverse risk in the loan portfolio. This regulatory guideline further directed the banks to classify a loan as non-performing where interest charge on the loan or the facility itself is mature for payment and unpaid for a period of 90 days and more; and where there is a capitalization of interest which results to a new loan status through rearrangement and rolled over. The prudential guidelines subdivide non-performing credit facilities into three categories which are, substandard, doubtful or lost (Central Bank of Nigeria, 2010). Despite the CBN's prudential guidelines, the level of non-performing loans continues to rise. For instance, in the year 2012, the Nigeria Deposit Insurance Corporation (NDIC) reported that non-performing loans totaled 286.09 billion naira, while in the year 2013, it increased to 321.66 billion naira representing an increase of 12.43% (Nigeria Deposit Insurance Corporation, 2013). Recently, the International Monetary Fund Report (International Monetary Fund, 2018) for Nigeria also reported an increase from 5% to 15.6% of non-performing loans in relation to total loans between June 2015 and October 2017. This development, apart from its negative impact on credit intermediation and the ability of the banking sector to support growth, also impairs banking performance since interest from loans which is the mainstay of banking income is lost.

Risk in the DMBs is also measured by the level of capital adequacy. Capital adequacy is a fundamental aspect of risk management and control function in a financial institution, including DMBs. Capital adequacy is an indicator of the financial strength of a bank revealed by the extent to which the bank's capital is able provide cushion to its risky loans. According to Mendoza and Rivera (2017), a good capital adequacy ratio enhances the financial stability of banks and improves their efficiency in the protection depositors' funds. The quality and strength of capital influence profitability. This is because the low level of Capital Adequacy Ratio (CAR) leads to higher borrowing cost which lowers profit. Capital adequacy, therefore, impacts banks' performance. The financial stability report by the CBN (Central Bank of Nigeria, 2017) documented that CAR came down by 3.3% for the period covering December 2016 to June 2017. Furthermore, the magnitude of risky assets in relation to first-tier capital stood at 16.3% in December 2016, while it came down to 12.4% in June 2017, representing a decline of 3.9%.

It's lawful for banks to charge-off debt (impaired loan) when it reaches a certain level of delinquency, and this varies with the type of credit (debt). A bank loan is impaired when it is likely that it will not be collected when it falls due as specified by the loan contract conditions and terms. When an impaired loan is charged off, it is entered as an expense in the income statement account. This has a declining effect on the value of the asset and the bank's financial position, including the net profit, especially in the year the charge is made. Impaired loan charge off is therefore an extension of credit risk which affects financial performance of DMBs. A case in point is the recent collapse of Diamond Bank Plc, whose huge non-performing loan level led to its impairment charges of 25 billion naira yearly. The bank consequently reported a profit after tax of less than 3 billion naira in its 2018 nine-month financial report (Nelson, 2018)

How do these risks impact performance of DMBs in Nigeria? The study closely examines the impact of these highlighted risks on financial performance of DMBs in Nigeria. Particularly, the extent to which impaired loan charge off impacts the performance of DMBs in Nigeria is a high point of the study as there are limited researches in this area.

## Literature Review

The review will cover brief conceptualization of the credit risks examined in the study and the empirical review of previous related studies.

### Conceptualization

The concepts of the credit risks considered in the study are highlighted in the first part of literature review. A non-performing loan is a risk factor in organizations providing credit, especially DMBs. It relates to loans for which the service agreement with respect to its liquidation is in full or part default. According to Hou and Dickinson (2007), non-performing loans are loans that are not generating interest because complete receipts of principal and interest are no longer probable from debtors and the facility has become delinquent for 90 days or more.

From this definition, a loan is said to have reached the threshold of being a non-performing loan if the interest on the loan and principal or both, remain fully or partly uncollected for a period of 90 days or more. It is in this light that the CBN Prudential Guidelines categorized non-performing loans into three: substandard, doubtful and lost. Substandard non-performing loans are loans for which interest and principal or both have not been fully collected for a period of 90 but less than 180 days. Doubtful loans remain irrecoverable for 180 but less than 360 days, while the loss category has a default period of 360 days or more. For each classification, the days in default start counting from the day loan repayment of both interest and principal are to commence.

High non-performing loans lead to bank failure because it adversely lowers the liquidity level and stifles the ability of the banks to expand credit. This, in addition to negatively impacting banks' performance also slows down growth in the real sector of the economy (Somoye, 2010; Hou & Dickinson, 2007).

Capital adequacy is an important concept in business particularly in the banking business because of its role in providing cover for its risky assets. Capital adequacy measures how much of a bank's capital represented by its net worth can allay the unfavorable effects of its risky loans (Economic Times Bureau, 2010), it mitigates widespread distress in the banking industry and spurs business exertion and performance (Ezike & Oke, 2013) and increases credit risk when it is low (Mukhtarov & Mammadov, 2018). In the banking sector, capital is composed of two types which are first-tier capital and second tier capital (Basel Committee on Banking Supervision, 2015).

Mendoza and Rivera (2017) explains that the first-tier capital is able to sop up losses which is not bad enough to force the bank to close operations, while the second-tier capital absorbs losses when the operations of the bank is in the process of liquidation and lowers the safety depositors' fund.

Impaired loan charge off are portions of total impaired loan which are charged against income in the income statement. The Basel Committee on Banking Supervision provides that impairment should be measured at its projected recoverable amount and be recognized by reducing the book value of loan through providing for an allowance or charge-off. This allowance or charge-off is then written off to the profit and loss statement in the financial year in which the impairment was done.

## Empirical Review

Roni and Teddy (2019) in their study tested the effect of credit risk in addition to liquidity and operational risks on performance of five (5) listed banks in Indonesia from 2009-2017. Non-performing loans and return on assets were proxy for credit risk and performance respectively, and data for these variables were analyzed by linear regression techniques. The regression results revealed that credit risk does not affect the performance of banks; this may be that the banks studied do not have a high level of default loans because of a good and workable credit risk management system in place. The result, however, showed that the relationship between performance and credit risk was negative, which is an indication that a continuous rise in non-performing loans will lower bank performance.

The CAMELS model was used by Kwado (2019) to assess the performance of Ghanaian banks. The first component in the model which is capital adequacy was measured as the sum of tiers 1 and 2 capital, forming the numerator of the ratio and the weight of risky assets (loans) as the denominator, to show the extent of credit risk, while return on equity was used as the performance measure. Results of the multiple regression analysis which the study adopted indicated that capital adequacy affects the performance of banks in a significant manner, though the relationship was negative.

In Uganda, Serwadda (2018) analyzed data for credit volatility and bank performance of twenty (20) commercial banks, in order to find out the relationship between them. Non-performing loans, the ratio of loan loss provision to total loan, among others, signified credit risk in the study, while return on assets measured performance of the banks. The regression results of the study showed that as non-performing loans increased, return on assets decreased in the opposite direction.

A panel regression analysis of the study of Ajayi and Ajayi (2017) revealed that the profitability (performance) of banks is negatively influenced by the trio of cost per loan, loan loss provision and non-performing loan, which was used as measures of credit risks. The study concluded that non-performing loans are increasing in the same direction of growth with total loans and advances of DMBs in Nigeria. This corroborates the International Monetary Fund (2018) report which stated an increase from 5% of total loans in 2015 to 15.6% in 2017.

Though most studies in Nigeria documented that non-performing loans impede performance of banks, the study of Patrick, Ikenna, and Ekemezie (2017) reported otherwise. The study concluded that an increase in non-performing loans increased the performance of the banks studied, noting that the poor performance of loan recovery spurred a higher interest on loan, which in turn increased profitability. Though it can be argued that what actually caused the increased performance was the higher interest rate and not the unrecovered loan per se.

The performance of banks in Nigeria was negatively influenced by increasing levels of bad loans and doubtful loans, for the period of 21 years from 1994-2014. This was revealed by the empirical study of Etale, Ayunku, and Etale (2016). The study generated data for its research from annual reports of the listed banks domiciled with the CBN and NDIC. Statistical measures of unit root test, descriptive statistics, and regression techniques were used to analyze the data. Specifically, results indicated that bad loans and doubtful loans impacted negatively, and in a significant manner, on return on capital employed, which was used as a measure of bank performance; while substandard loans did not have a significant impact on return on capital employed with both having a negative relationship.

Ozurumba (2016) submitted that non-performing loans pose an immense danger to the corporate existence of commercial banks in Nigeria and it should not be underestimated as it also affects banks' performance negatively. His study covered 14 years from 2000-2013 and the results of the ratio and regression analysis led to the conclusion that the performance of the banks both in terms of return on assets and return on equity was low when the non-performing loan level rises.

The study of Omitogun, Olanrewaju, and Alalade (2016) sought to know the relationship between loans default, which they referred to as 'problem loans' (p. 65) financial performance in five (5) Nigerian banks. These banks' financial statements for five years (2010-2014) were examined using the ordinary least squares regression technique, and the result of the regression revealed a positive and significant relationship between default loans and returns on assets. The study also reported that, at a significant level of 10%, a negative relationship existed between loans and advances and returns on assets. This level of significance of 10% (being more than 5% benchmark for most researches in the social sciences) between loans and advances and performance may be seen as not significant enough to conclude that increasing loans and advances lead to declining returns on the banks' assets.

Another Nigerian study conducted by Kayode, Obamuyi, Owoputi, and Adeyefa (2015) noted that the performance index of return on assets of six banks was poor and was on a decline from the year 2000 to 2013, as a result of an increase in credit risk portfolios. However, the study also found that total loan can significantly trigger an increase in returns on assets of the banks. This goes to say that when banks are able to expand their loan credit facilities, and recover substantial amounts of the loans, it will lead to high performance in profitability and returns.

Empirical research covering the period of eleven (11) years from 2000-2010 by Kolapo, Ayeni and Oke (2012) was carried out in order to investigate how credit risk exerts influence on performance of commercial banks in Nigeria. It was found in the study that, for the period under review, performance of the banks was reduced by about 6.2% when non-performing loan facilities increased by 100%. In the same vein, an increase of 100% in loan loss provision brought down banks' performance by about 0.65%. On the contrary, banks' performance which was represented as return on assets in the study witnessed an increase of about 9.6% when total loan and advances increased by 100%. Even though the empirical analysis did not show the individual effects of these risks on each of the banks' performance, it noted that the risks effect was similar across all the banks studied.

Sheeba (2017) conducted a time-series study focusing on how volatility of credit impacted on profitability of The State Bank of India. Data for return on equity were collected to measure performance while relevant ratios such as capital adequacy ratio, non-performing asset to asset ratio among others were used as measures for credit risks. The bank's financial statements for twenty (20) years from 1997 to 2016 were analyzed using multiple regressions. The result showed

that only non-performing facilities to total assets ratio wielded significant and negative impact on the performance of the single bank studied.

Isanzu (2017) focused his research on Chinese banks and investigated the financial performance of the banks vis-à-vis the potential influence of credit risk. The study reported that non-performing loans have a negative impact on financial performance, while capital adequacy positively improved the level of performance. However, both impaired loan reserve and loan impairment did not have any significant impact on financial performance. On the whole, the study concluded that credit risk influences the financial performance of Chinese banks.

Moved by the susceptibility of banks to the adverse effect of credit risk, especially on their profit, Annor and Obeng (2017) did a study of listed commercial banks in Ghana to assess how profitability reacts to the impact of credit risk. The Ghana Banking Survey and financial reports of the banks provided data for a loan to asset ratio, capital adequacy, loan loss provision, non-performing loan and return on equity, the latter being the measure of profitability. Statistical analysis of the results of the study shows that capital adequacy and profitability are positively and significantly related. However, the individual impact of loan to asset ratio, loan loss provisions, and non-performing loans was inversely related to profitability in a significant manner.

Kodithuwakku (2015) examined the association of credit risk and performance of eight (8) Sri Lankan banks. Five (5) year panel data from 2009-2013 were collected from the selected banks. Profitability which was measured as return on assets represented the banks' performance while non-performing loans to overall loans, loan provision to overall loan, loan provision to overall assets and loan provision to non-performing loans, on the other hand, were used as a proxy for credit risk. Results from the study revealed that credit risk significantly impacted on performance of the banks.

This study will therefore hypothesize that: There is positive impact of capital adequacy on performance of DMBs in Nigeria, and there is negative impact of both non-performing loan and impaired loan charge off on the performance of DMBs in Nigeria.

## Research Methodology and Study Models

This study adopted the Correlation and Ex-post factor design. This is because correlation establishes relationship, which further explains impact of two or more variables on each other. Study data emanated from secondary sources collected from the individual bank's annual reports and accounts, certified by external auditors for the period 2006-2017. All the fifteen (15) deposit money banks quoted on the Nigerian Stock Exchange as on 31st December, 2017 constituted the population of the study. Table A1 presents the list of the listed deposit money banks that make up the population. The study used multiple regression technique as a tool of analysis with the aid of STATA 13. Data was extracted for the independent variables of the Non-Performing Loan (NPL) ratio, Capital Adequacy (CAD), Impairment Loan Charge-off (ILC) and the dependent variable of Return on Assets (ROA).

**Table A1: Listed Deposit Money Banks in Nigeria**

S/No.	Listed DMBs
1	Access Bank Plc
2	Diamond Bank Plc
3	Eco Bank Plc
4	Fidelity Bank Plc
5	First Bank of Nigeria Plc
6	First City Monument Bank Plc
7	Guarantee Trust Bank
8	Skye Bank Plc
9	Stanbic IBTC
10	Sterling Bank Plc
11	Union Bank of Nigeria Plc
12	United Bank for Africa Plc
13	Unity Bank Plc
14	Wema Bank Plc
15	Zenith Bank Plc

Source: NSE 2017

## Model Specification and Variable Measurement

The study employed the GMM model to regress the dependent variable against the independent variables, and to test the hypotheses of the study. The functional equation/model is given as:  $ROA = f(NPL, CAD, ILC)$ . This is translated into an econometric model as:

$$ROA_{it} = \alpha_0 + \beta_1 NPL_{it} + \beta_2 CAD_{it} + \beta_3 ILC_{it} + \beta_4 SIZ_{it} + \beta_5 LEV_{it} + e$$

Where: ROA is Return on Assets; it denotes cross-section and time;  $\alpha$  is constant term;  $\beta_1 - \beta_4$  represents the slope or gradient of independent variables; NPL stands for Non-Performing Loan; CAD is the acronym for Capital Adequacy; ILC is Impairment Loan Charge; SIZ is Firm Size; LEV is Leverage and  $e$  is the error term. Firm size and leverage are added to the model as control variables. Table B2 displays the variables measurement.

**Table B2 : Variable Measurements**

S/N	Variable Acronym	Variable Name	Variable Measurement	Nature of Variable	Source
1	ROA	Return on Assets	Ratio of Total Income to Total Assets	Dependent Variables	Patrick, et al. (2017)
2	NPL	Non-Performing Loan	Ratio of Total Non-Performing Loan to Gross Loan	Independent Variables	Isanzu (2017)
3	CAD	Capital adequacy	Weighted Capital Adequacy for Tier 2	Independent Variables	Isanzu (2017)
4	ILC	Impairment Loan Charge	Ratio of Total Loan Impairment Charge to Total loan	Independent Variables	Isanzu (2017)
5	SIZ	Firm size	Log of Firm Size	Control variable	Kutum (2017)
6	LEV	Leverage	Ratio of Total Liabilities to Total Assets	Control Variable	Hashim and Hassan (2017)

### Discussion of Results

The statistical results as generated by the STATA software are presented in tables and discussed.

**Table C3: Descriptive Statistics**

Variables	No of Observations	Mean	Standard Deviation	Minimum	Maximum
ROA	168	0.0177	0.0326	-0.1241	0.2828
NPL	168	0.0663	0.0659	0.0047	0.3009
CAD	168	0.1949	0.1261	-0.4698	0.4823
ILC	168	0.0198	0.0225	0.0000	0.0962
LEV	168	0.8591	0.0890	0.7019	1.3901
SIZ	168	5.8796	0.4246	4.8789	6.7264

Source: Results from STATA Output

Refer to Table C3 for descriptive statistics. The return on assets has a mean value of 0.0177 and a standard deviation of 0.0326 indicating a wide disparity of the data from the mean. It further showed that non-performing loan has a mean value of 0.0663 and a standard deviation of 0.0659 suggesting a moderate dispersion. Also, Capital Adequacy has an average value of 0.1949 and a standard deviation of 0.1261 indicating that there is a close cluster of the variables around the mean. This mean value reveals that throughout the period of study the average value for weighted capital adequacy of the listed deposit money banks is 19.5% which is above the statutory requirement of 15% (Patrick, Ikenna, & Ekemezie, 2017). This is also an indication of a robust capital base of the banks. The loan impairment charge displays a mean value of 0.0198 and a standard deviation of 0.0225. The standard deviation suggests a wide dispersion from the mean. It suggests that the loan impairment writes off of the banks does not follow a similar pattern. The mean and standard deviation for the control variable, leverage, shows a value of 0.8591 and 0.890 indicating a low dispersion. It suggests that the debt patterns of the bank are similar, and the banks finance their operations through borrowing to the tune of 85%; the remaining 15% is

attributable to equity financing. Finally, the firm size shows a mean value of 5.8796 and a standard deviation of 0.4246, indicating a disparity in the asset base of the banks for the period of the study.

**Table D4: Correlation of Variables**

Variables	ROA	NPL	CAD	ILC	LEV	SIZ
ROA	1.0000					
NPL	-0.1491	1.0000				
CAD	0.0878	-0.0823	1.0000			
ILC	-0.2055	0.2475	-0.2196	1.0000		
LEV	-0.3961	-0.0287	-0.1488	0.1472	1.0000	
SIZ	-0.0608	-0.3069	0.0643	-0.3379	0.1157	1.0000

Source: Results from STATA Output

Refer to Table D4 for correlation matrix which shows the strength of the associations between the variables as well as the direction which these relationships follow. The matrix reveals that the correlation coefficient between ROA and NPL is -0.1491, which indicates that NPL has a weak negative association with ROA. The strength and direction of association between ROA and CAD is very weak at 0.0878, which is positive. Furthermore, both ILC and LEV are negatively associated with ROA and with weak and moderate association coefficients of -0.2055 and -0.3961 respectively; SIZ also has a very weak and negative correlation with ROA. The correlation matrix also shows that no explanatory variables are perfectly correlated which is an indication of the absence of harmful multicollinearity among independent variables. This is further corroborated by the results of the Variance Inflation Factor (VIF) in Table F6 (given in appendix) an overall mean VIF of 1.15.

**Table E5: Summary of Regression Result – OLS Model**

Variables	Coefficients	T-Value	P-Value
Constant	0.1179	1.9300	0.0550
NPL	-15.7466	-2.1400	0.0340
CAD	-0.0064	-0.0900	0.9310
ILC	-0.1401	-2.4100	0.0170
LEV	-0.0571	-2.1300	0.0350
SIZ	-0.0091	-1.1900	0.2370
R <sup>2</sup>	0.2066		
Adj. R <sup>2</sup>	0.1821		
F-Statistics	7.2000		0.0000
Hausman test	3.1700		0.6743
Lagrangian Multiplier Test	2.2900		0.0650

Source: Results from STATA Output

Refer to Table E5 (Summary of Regression Result – OLS Model given in appendix) for discussions on the impact of each credit risk on the performance of DMBs. The OLS model is used to interpret the results of the study after running tests for the fixed effects model (Table G7 given in appendix), random effects model (Table H8 given in appendix), Hausman specification (Table I9 given in appendix), and the Lagrangian multiplier test for random effects (Table J10 given in appendix). The result of the Lagrangian multiplier test for random effects suggested that the OLS

model is best suited for the study, hence the justification for using the result to examine the impact of each of the considered credit risk on the performance of the banks studied.

### **Non-Performing Loan Ratio and Financial Performance**

Non-performing loan (NPL) has a negative and significant impact on the financial performance of listed deposit money banks in Nigeria during the period under review. This is indicated by the sign of the coefficient which is -15.746, the t-value of -2.14 and the p-value of 0.034. This further shows that an increase in the non-performing loan ratio will affect financial performance negatively. It further means that any percentage increase in the ratio of non-performing loan against gross loan will reduce the financial performance of the banks. The result is in conformity with previous works by Isanzu (2017), Almekhalafi, Almekhlafi, Kargbo and Hu (2016), Kolapo, Ayeni & Oke (2012) and Ruziqua (2013); and contrary to the work of Patrick, Ikenna & Ekemezie (2017), Kutum (2017), Saeed and Zahid (2016). On the strength of this result, the study fails to reject the hypothesis that there is a negative impact of NPL on ROA.

### **Capital Adequacy Ratio and Financial Performance**

The results show that capital adequacy was found to have a negative and insignificant effect on return on assets. The table reveals that capital adequacy has a coefficient of -0.00647 and a p-value of 0.931 which is not statistically significant. The result is contrary to prior studies by Annor and Obeng (2017), Isanzu (2017) and Kargi (2011). The study, therefore, rejects the hypothesis of positive impact of CAD on ROA.

### **Impairment Loan Charge-off and Financial Performance**

The study also found that loan impairment charge has a negative and significant impact on ROA of DMB's in Nigeria. The result output shows that ILC has a coefficient of -0.14011 and p-value of 0.017. This implies that any impairment written off will, in turn, affect the financial performance of the deposit money banks in Nigeria negatively. This is contrary to the work of Isanzu (2017) and thus, the hypothesis that there is a negative impact on impairment loan charge on performance is, therefore, accepted.

## **Conclusions, Recommendations and Policy Implications of the Study**

This study examined the impact of credit risks on the financial performance of listed deposit money banks in Nigeria between 2006 and 2017. The study used a sample of fifteen deposit money banks listed on the NSE as at 31 December 2017. From the panel least square regression results, the study concludes that non-performing loan and loan impairment written off have a negative and significant impact on financial performance of the deposit money banks in Nigeria; while the impact of capital adequacy was insignificant in the period under review. Drawing from these conclusions, it is recommended that a thorough review of existing rules and guidelines bothering on the provision of bank loans be done by stakeholders in order to assess and evaluate their effectiveness in light of current realities in the banking sector. By way of policy implication, there should be a policy for short-term periodic review of prudential guidelines and other regulations governing banking operations with respect to providing loan facilities, which will address evolving issues relating to credit risks.

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## Appendix

**Table F6: Test for Multicollinearity (Variance Inflation Factor)**

Variables	VIF	1/VIF
NPL	1.14	0.880704
CAD	1.07	0.936548
ILC	1.25	0.802173
LEV	1.07	0.932782
SIZ	1.24	0.809643
Mean VIF	1.15	

Source: Results from STATA Output

**Table G7: Fixed Effects (within) Regression**

No. of observations	168	R-sq:within	= 0.1326			
No. of groups	14	between	= 0.4439			
F(5,149)	4, 56	overall	= 0.1946			
Prob>F	0.0007					
ROA	Coef.	Std. Err.	t	p>[t]	95% Conf.	Interval
Constant	.1383922	.0483786	2.86	0.005	.0427954	.233989
NPL	-17.84585	7.901678	-2.26	0.025	-33.45967	-2.232029
CAD	.0292222	.0886872	0.33	0.742	-.1460248	.2044693
ILC	-.1167145	.0742748	-1.57	0.118	-.2634825	.0300535
LEV	-.0425856	.0132682	-3.21	0.002	-.0688038	-.0163675
SIZ	-.0147631	.0082763	-1.78	0.076	-.0311172	.001591
<b>F-test</b>	<b>F(13, 149)</b>	<b>=1.84</b>			<b>Prob&gt;F=0.0414</b>	

Source: Results from STATA Output

**Table H8: Random Effects GLS Regression**

No. of observations	168	R-sq:within	= 0.1300			
No. of groups	14	between	= 0.5125			
Walc chi2(5)	32.74	overall	= 0.2051			
Prob>chi2	0.0000					
ROA	Coef.	Std. Err.	z	p>[t]	95% Conf.	Interval
Constant	.1240083	.0399754	3.10	0.002	.0456579	.2023587
NPL	-17.00351	7.492927	-2.27	0.023	-31.68938	-2.317644
CAD	.0072709	.0830162	0.09	0.930	-.1554379	.1699797
ILC	-.1329512	.0709347	-1.87	0.061	-.2719807	.0060782
LEV	-.0510596	.0119139	-4.29	0.000	-.0744104	-.0277087
SIZ	-.0110442	.0067151	-1.64	0.100	-.0242056	.0021171

Source: Results from STATA Output

**Table I9: Hausman Specification Test**

Variables	fe	re	Difference	S.E.
NPL	-17.84585	-17.00351	-.842339	2.5085
CAD	.0292222	.0072709	.0219513	.0312046
ILC	-.1167145	-.1329512	.0162367	.022023
LEV	-.0425856	-.0510596	.0084739	.0058399
SIZ	-.0147631	-.0110442	-.0037189	.0048378
Chi2(5) = 3.17 Prob>chi2 = 0.6743				

Source: Results from STATA Output

**Table J10: Lagrangian Multiplier Test for Random Effects**

Variables	var	sd
ROA	.001067	.032665
e	.0008174	.0285907
u	.0000806	.008979
<b>Chibar2(01) = 2.29</b>	<b>Prob&gt;Chibar2 = .0650</b>	

Source: Results from STATA Output

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### *Authors' Profile*

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