CREDIT RISK AND COMMERCIAL BANKS' PERFORMANCE IN NIGERIA

INUA, OFE IWIYISI (Ph.D.)
DEPARTMENT OF FINANCIAL STUDIES
FACULTY OF MANAGEMENT SCIENCES
NATIONAL OPEN UNIVERSITY OF NIGERIA
oinua@noun.edu.ng/ofejobs@yahoo.com

EHIKIOYA, BENJAMIN (Ph.D)
DEPARTMENT OF FINANCIAL STUDIES
FACULTY OF MANAGEMENT SCIENCES
NATIONAL OPEN UNIVERSITY OF NIGERIA
benehikioya@gmail.com

Abstract

Credit risk has remained a subject of intense debate, especially since the recent global financial crisis. Thus, this study empirically examined the effects of credit risk management on the performance of commercial banks in Nigeria. The study relied on secondary data sourced from the audited annual reports and account of the relevant sampled commercial banks, NSE Fact Book 2017 and CBN Statistical bulletin 2017. The dependent variable in this study include Return On Asset and Tobin Q. While the independent or explanatory variables are Non-performing loan, loan loss provision, bad loan written off, loan to deposit ratio and equity to asset ratio. The study employed the regression model to analyze data from banks listed in Nigeria Stock Exchange for the period 2010 – 2017. The study reveals that non-performing loans and have a significant negative effect (-0.218) on the performance of banks in Nigeria with ROA as proxy for bank performance. the study therefore recommends that Nigerian commercial banks should improve their credit risk system that allows the operationalization of a sound credit granting process and administration. The banks should promote an efficient control, monitoring and supervision system of loans and advances.

Keywords: Credit Management, Non-performing loans, Bad debt, Bank performance, Regulators

Introduction

Since the recent global financial crisis, stakeholders of the bank have been worried about the effect of credit risk on the banking system. This issue has remained a concern in the banking sector due to weak institutional and governance structures, especially in developing countries like Nigeria. The banking sector is a key sector of the economy that helps to pull resources to the real sectors. Following the uniqueness of the banking sector, different interest groups in the society has continued to advocate for the prudent management of its activities. In addition, various stakeholders have also emphasized the need for effective credit risk management in order to

guarantee the survival and growth of the bank. Organizations around the world rely heavily on loans and advances, and other forms of credit facilities to run their business activities. However, while loans and other forms of credit facilities have brought significant values to the organizations, a good number of them have equally gone extinct due to poor credit risk system in place, an indication for regulatory failure, and weak institutional and corporate governance structures in the system. A quick assessment of the Nigeria operating environment indicates that the Nigerian banks have suffered from both regulatory failure and weak institutional and governance structure. This could be seen in the number of banks that have gone down and the inability of the remaining ones to support big projects despite the rendition of quality returns to the regulators.

Globally, financial institutions play a strategic role in ensuring economic growth and development through the mobilization of savings from areas of surplus to the real sector of the economy. Lending in financial institutions constitutes a key asset of the bank that needs to be properly managed for the institutions to play a significant role in economic growth and development. For an economy that depends on the performance of the financial institutions to grow, a good credit risk system is important to enhance investors' confidence and stimulate investment. Apart from the management of the banks, the regulators have also stressed the need for banks to have a set of procedures to monitor and deal with credit transactions in order to ensure the survival of the business. Credit risk management is an essential part of banking activities for measuring and optimizing the profitability of banks in both developed and developing countries. The long-term success of any banking institution depends on an effective system that ensures the repayments of loans by borrowers. According to Greuning and Bratanovic (2003), effective credit risk management involves the establishment of a suitable credit risk environment; operating under a sound credit granting process, maintaining an appropriate credit administration that involves monitoring, processing as well as having enough controls over credit risk.

A review of the different episodes of financial crises in Nigeria reveals that several banks collapsed mainly due to significant nonperforming loans in their portfolio. Banking institution thrives on loans and advances as it core business activity. And these loans are usually classified into performing and nonperforming, which is further classified as doubtful, bad and lost. In many instances, nonperforming loans have remained a source of concerns for financial institutions, especially in developing countries. Managers of banking

institutions struggle to manage the effect of nonperforming loans on the overall performance of the bank. An efficient credit management system reduces the amount of capital tied up with debtors and minimizes bad debts. As noted by Horner (2013), good credit management can have a positive influence on performance. In economic system, financial institutions provide the responsibility of influencing economic growth by mobilizing savings for productive investments in various sectors of the economy (Shafiq & Nasr, 2010; Greuning & Bratonovic, 2003). Thus, the significance of commercial banks in an economy may not be eliminated as they are seen as institutions that provide liquidity for both lender and borrower (Lydnon, Ayunku & Ebitare, 2016).

Several scholars have argued that when there is a poor performance from the banking sector, the effects hamper the overall economic growth (Chege & Bichanga, 2017). However, to make the sector a vibrant one, banks would need to mobilize funds through deposit and channel such funds to the real sectors of the economy through lending. Lending exposes banks to risks that have to be properly evaluated in order to reduce the problem of nonperforming loans in the system (Iwedi & Onuegbu, 2014). As documented by Aminu (2012), a well-managed loan process tends to minimize bank risk by maintaining exposure with a view to protecting the bank from the adverse effects of credit risk. In view of the need to tackle this important issue faced by the Nigerian banking sector in recent times, the Central Bank of Nigeria (CBN) had an agreement in 1987 known as the Basel accord, which stressed the importance of capital adequacy for banks (Iwedi, & Onuegbu, 2014). High levels of non-performing loans (NPL) have the tendency to reduce the lending ability of commercial banks and possibly put them out of business. In line with this assertion, Nawaz et al (2012) claimed that the size of non-performing loans in the banking system could erode investors' confidence and create panic in the banking industry.

Financial institution is one of the sectors of the economy that is susceptible to many risks including the credit risks that are characterized by bad loans. Credit risk is one of the fundamental problems faced by financial institutions in developing countries. This is partly because of the high level of defaults in the system. There is no doubt that Non Performing Loans hinders the financing capacity of the banks and therefore, has an adverse impact on the overall socio-economic development of the country. The failure to manage nonperforming loans may lead to insolvency and losses among financial institutions (Ali & Iva, 2013). Consequently, following the limitations in terms of credit management variables and the recommendation for further studies

in Uwalomwa, Uwuigbe & Oyewo (2015), this study attempts to measure the relationship between credit risk and performance of commercial banks in Nigeria.

Development of Hypotheses

To investigate the impact of credit risk on bank performance, the study postulate the following hypotheses:

H_{O1}: There is no significant relationship between loan loss provision and performance of commercial banks in Nigeria.
H_{O2}: There is no significant relationship between non-performing loans and performance of commercial banks in Nigeria.
H_{O3}: There is no significant positive relationship between loan to deposit and performance of commercial banks in Nigeria.
H_{O4}: There is no significant positive relationship between bad loans written off and performance of commercial banks in Nigeria.
H_{O5}: There is no significant positive relationship between equity to asset ratio and performance of commercial banks in Nigeria.

Literature Review

Credit risk, which is the probability that a debtholder would default or unable to meet the debt obligations in a contract has been a subject of concern in recent times (Salas & Saurina, 2002; Owojori, Akintoye & Adidu, 2011). This is partly because of the importance of finance to both individuals and corporate organizations on the one hand and on the other hand, because of the alarming nature of nonperforming loans especially in developing countries like Nigeria. Ezirim (2005) argued the need for banks to handle lending with caution and tact due to the risks associated to such lending. The commercial banks have a key function to advance loans and advances to the real sector of the economy, which forms the core of its assets. This function exposes commercial banks to certain risks in its activities. Consequently, banks are usually enjoined to continually review and measure the credit risk profile as part of the strategies to guarantee returns on investment. According to Koch and MacDonald (2006), bank management is geared towards the maximization of shareholders wealth. Credit risk management aimed at reducing the potential risk of default that is likely to threaten the going concern of a business remains a tool for managers to ensure shareholders' wealth maximization.

There are several theoretical and empirical works relating to banks and its performance (Shafiq & Nasr, 2010; Iwedi, & Onuegbu, 2014; Uwalomwa et al, 2015; Lydnon et al, 2016). These studies, though with mixed results have attempted to examine how effective credit risk management may assist to reduce the possibility of loan default and improved the required financial performance of the firm.

According to the Commercial Loan Theory, banks can minimize their potential risks of default and maximize returns by engaging only in short-term and self-liquidating lending activities. This theory remains a useful tool for banks and their regulatory agencies to monitor the activities of bank lending. The theory aimed at ensuring that the banks lend to improve the overall economic activities of the country (Hosna & Manzura, 2009). Although this theory has gained popularity among the Nigerian banks because of their lending policy that focuses on short-term basis, Kargi (2011) argued that the theory might have reduced in its appeal due to recent development in banking especially as it relates to the adoption of secondary reserve assets that could serve as a liquidity buffer for the banks. An intriguing part of the commercial loan theory is the emphasis on short-term lending which makes it difficult, if not impossible, for firms in developing countries like Nigeria to finance assets such as building, land, plants and equipment. In the opinion of Ojo (1999), commercial banks can lend on medium and long-term maturity too without necessarily jeopardizing their liquidity to be able to contribute meaningfully to economic development. Part of the significant control in finance is the use of long-term financing structure to finance assets.

Investigation on the issue of credit risk management and performance of financial institutions have gained the attention of scholars and policymakers, especially since the recent global economic upheaval. Prior studies suggests that an effective credit risk management system, which involves a commitment from the financial institutions, regulators and the clients on the one hand, and on the other hand, which encompasses good policies, programs, structure, monitoring and control, contributes in several measures to the success of a credit risk management (Bagchi, 2003; Muninarayanappa & Nirmala,2004). Iwedi, and Onuegbu, (2014) argued that credit risk management plays a key role in the bank's financial performance. In the opinion of Salas and Saurina (2002), there is a significant relationship between non-performing loans and growth in GDP, credit expansion and bank profitability. In addition, studies have shown that there is a link between credit risk management and bank performance. For instance, Shafiq

and Nasr (2010) used data from emerging economies to examine the determinants of commercial banks credit risk and documented the significance of regulation and quality of management team for banks offering multi-products and services. In addition, they found that credit risk management has a significant influence on bank profitability. Godlewski (2004) reported that the level of non-performing loans negatively influences banks profitability measured as return on asset.

In a related study, Das and Ghosh (2007) used the regression technique and data from Kenya to examine the correlation between bank performance measured as Return on Equity and credit risk management proxy as the ratio of non-performing loans to the total asset. They documented that Non-performing loans (NPL) has effect on profitability. In a similar study, Chege and Bichanga (2017) examined the impact of credit risk management proxied as a nonperforming loan on 44 commercial banks in Kenya for the period 2011 to 2015 and reported that credit and nonperforming loans have very little influence on profitability. They documented that nonperforming loans had a statistically significant effect on financial performance measured as return on assets. In Costa Rican, Boland (2012) employed the regression analysis to examine the influence of credit risk on bank performance for the period 1998-2007. In that study, Boland reported that bank performance improves following regulatory changes and non-performing loans have a negative influence on performance measured as return on assets (ROA). In another study, Asantey and Tengey (2014) used data from banks in Ghana for the period 2008 to 2013 to examine the effect of bad loans on the lending potential and financial performance. They reported a significant negative correlation between bad loans and net profit on the one hand, and on the other hand, a negative relationship between bad loan and lending potential.

In a study conducted in Nepal, Osuka and Amako (2015) used time series data from 2001 – 2011 to investigate the impact of credit risk management on banks' performance. The result of their investigation reveals that credit risk management is an important predictor that can influence banks' performance. In a related study, Saba, Kouser and Azeem (2012) employed data for the period 1985-2010 and the OLS regression model to examine the determinants of non-performing loans in the US banking sector, and found a significant positive relationship between real total loans and non-performing loans. Ali and Iva (2013) employed the OLS regression model and data for the period 2002-2012 to examine the impact of banks' specific factors on non-performing loans in the Albanian banking system. The results of their study

indicated that real exchange rates and loan growth rate have a positive relationship with non-performing loans.

In Nigeria, studies have been done too to examine the influence of credit risk management on performance but with mixed results. For instance, Kargi (2011) examined this issue in some banks in Nigeria during the period 2004 to 2008 and found the existence of a significant relationship between banks performance and credit risk management. Lydnon et al., (2016) examined the link between non-performing loans and bank performance in Nigeria for the period 1994-2014 and reported that high level of non-performing loans has a significant negative effect on bank performance. Similarly, Ugoani (2016) found that nonperforming loans have a negative effect on bank profitability in Nigeria. Taiwo and Taiwo (2014) employed the annual data of ten banks during the period 2006 to 2010 to examine the relationship between credit management and profitability of banks in Nigeria. The result of the Ordinary Least Square regression analysis shows that return on asset has a positive correlation with the current ratio. Iwedi and Onuegbu (2014) used secondary data to investigate the effect of credit risk on the performance of five banks in Nigeria over the period 1997-2011. The result of their panel data regression techniques shows that there is a positive relationship between the ratio of nonperforming loans to loans and advances. In addition, their result show that there is a positive relationship between nonperforming loans and banks performance.

In a related study, Onaolapo (2012) used secondary data for the period 2004 to 2009 to analyze the relationship between credit risk management and financial health of selected commercial banks in Nigeria. The study performed unit root and test to verify the order of integration of the data employed. The results of the regression analysis revealed a nominal causation between deposit exposure and performance. Also, Ogboi and Unuafe (2013) employed data for the period 2004 - 2009 to examine the impact of credit risk on banks financial performance in Nigeria. Their findings showed that efficient credit risk management and capital adequacy positively impact on banks' financial performance. However, the study revealed too that there is a negative relationship between loan loss provisions, loans and advances, non-performing loans and capital adequacy as the independent variables and performance measured as return on asset as the dependent variable. Furthermore, Taiwo, Ucheaga, Achugamonu, Adetiloye, Okoye, and Agwu (2017) investigated the implication of credit risk management on bank performance and lending growth of Deposit Money Banks (DMBs) in Nigeria. The study employed the regression model to analyze data for the period

1998-2014. The result showed that sound credit management strategies could boost investors and depositors' confidence. However, they found that credit risk management has no significant impact on the growth of total loans and advances of Deposit Money Banks in Nigeria.

Methodology

The population of the study are the 15 commercial banks listed on the Nigerian Stock Exchange. To achieve the objective of the study, 10 banks were selected based on the purposive sampling method and these banks are Access Bank, Fidelity Bank, First Bank, First City Monument, Guaranty Trust Bank, Stanbic Ibtc, Sterling Bank, Union Bank, United Bank for Africa and Zenith Bank. These banks were selected because they had the complete set of data required for the study. The period of study witnessed sever weak corporate governance and institutional structures issue, which resulted in a huge loan structure in the banking system. Also, the change of political leadership from one Democratic Party to another informed the choice of the period under review since this could have impacted on banks and the economy. Thus, it was important to understand how banks were using credit risk management to adapt to the environment and improve performance. The study relied on secondary data sourced from the audited annual reports and account of the relevant sampled commercial banks, NSE Fact Book 2017 and CBN Statistical bulletin 2017.

Model Specification

This study employed the descriptive statistics and panel data regression model to analyse and examine the relationship between credit risk management and performance of commercial banks in Nigeria. Specifically, the regression model is anchored on fixed and random effects models, which are two main approaches to empirical research that are based on a panel data set. The fixed and random effects models have the ability to control for unobserved time-invariant heterogeneity peculiar to economic agents. The key component for these models is that while fixed effects model assumes that the heterogeneity is correlated with the explanatory variables, random effects model assumes that the individual specific effects are uncorrelated with the explanatory variables (Gujarati, 2004). The study employed the Hausman specification test to determine which of the models, fixed and random effects would be appropriate to analyse the relationship between the variables of the study. The regression model for this study is stated as;

$$ROA_{it} = \partial_0 + \partial_1 LLP_{it} + \partial_2 NPL_{it} + \partial_3 LDR_{it} + \partial_4 EAR_{it} + \partial_5 BLWO_{it} + \sum_{it} \text{..(1)}$$

$$Tobin-Q_{it} = \partial_0 + \partial_1 LLP_{it} + \partial_2 NPL_{it} + \partial_3 LDR_{it} + \partial_4 EAR_{it} + \partial_5 BLWO_{it} + \sum_{it}$$

…… *(2)*

Where:

ROA = Return on Asset
Tobin-Q = Tobin Q
LLP = Loan Loss Provision
NPL = Non Performing Loan
LDR = Loan to deposit Ratio
EAR = Equity to Asset Ratio
BLWO = Bad Loan Written Off
∂_0 = constant
∂_1 …… ∂_5 = variables that vary across banks but do not vary over time
$\sum$ = error terms over the cross section and time.
i, t = cross section of listed banks in time variant

The bank performance variable is proxy by return on asset and Tobin-Q, which is the dependent variable, and the explanatory variables include the loan loss provision, non-performing loan, loan to deposit ratio, equity to asset and bank loan written-off. The operationalization of the variables is presented in Table 1. The study tests the null hypothesis that there is no correlation between the unobserved bank-specific random effects and the explanatory variables.

$$H_0 : Cov\ (X_{it}, a_i) = 0$$
$$H_a : Cov\ (X_{it}, a_i) \neq 0$$

The test statistic is Wald X^2, with k-1 degree of freedom (where k is the number of regressors). If X^2 is statistically significant, we reject the null hypothesis and accept the alternative. It means that there is a correlation between the unobserved bank-specific effects α_I and the explanatory variables. Thus, the fixed effects model (FEM) would then be the model of choice.

Test of Homoscedasticity:

The study is set out to test whether there is a constant variance of the disturbance term, a situation that is common with homoscedasticity. For the panel data model, we would perform a Breusch-Pagan / Cook-Weisberg test for heteroscedasticity based on the estimation results. The study would test the null hypothesis of homoscedasticity.

$H_0: \delta^2\varepsilon_i = \delta^2 \text{ for all } i.$

$H_0: \delta^2\varepsilon_i \neq \delta^2 \text{ for all } i.$

The test statistic is the critical X^2 value at the chosen level of significance. If the critical chi-square exceeds the theoretical chi-square, then we would reject the hypothesis of homoscedasticity and conclude that there is the presence of heteroscedasticity.

Table 1: Operationalization of Variables

Variable	Measurement	Sources
Return on Asset (Dependent variable)	Return on asset in percentage is computed as profit after tax divided Total asset	Asantey and Tengey (2014)
Tobin Q (Dependent variable)	Tobin Q in numbers is computed as Market Capitalization + Total Liabilities' - Cash flow divided by Total asset	Ogboi and Unuafe (2013)
Non-Performing Loan (Independent variable)	Non-Performing Loans to loans in percentages is computed as non-performing loans divided by total loans and advances to customers.	Boland (2012)
Loan Loss Provision (Independent variable).	Loan loss provisions or credit impairment provisions in thousands is the amount banks set outside to cover bad loans or impaired credits.	Hosna & Manzura, (2009)
Bad Loan Written off (Independent variable).	Bank Loans Written-off in thousands is the amount of loans charged off or written off as reported under loans and advances note of accounts.	Hosna & Manzura, (2009)
Loan to Deposit Ratio (Independent variable).	Measured in percentage is derived by dividing the amount of total loan by total deposit	Godlewski, (2004)

Equity to Asset Ratio (Independent variable)	The ratio, expressed as a percentage, is calculated by dividing total shareholders' equity by total assets of the firm, and it represents the amount of assets on which shareholders have a residual claim	Godlewski, (2004)

Authors Compilation 2018

Results and Discussion

Descriptive statistics

The study investigates the influence of credit risk management on the performance of commercial banks in Nigeria. The results of the descriptive statistics as reported in Table 2 indicate that return on asset has a mean value of 2.06 and a standard deviation of 1.20. This result compared to the yearly basis, shows that the overall return on asset is below the performance of year 2012 (2.42), 2013 (2.08) and 2014 (2.26) respectively. This suggests that every naira utilization on asset yielded profit above the average for the period 2012 to 2014 clearly before the economy fell into recession in 2016. Furthermore, we observe that the only year 2012 (0.99), 2013 (1.05) and 2014 (1.01) have higher average Tobin-Q than the overall average of 0.98. Again, this result shows the same trend as the result obtained from the variable of return on asset. In terms of loan loss provision, we find that on the average, the sampled banks made an average loss provision of -2.59 and a standard deviation of 3.09. Surprisingly, the yearly analysis shows that the loan loss provision from the sampled banks was higher before the economy fell into recession. The result suggests that non-performing loan during the period of economic crisis in Nigeria, that is year 2016 (5.87) and 2017 (6.78) rose beyond the sector average of 4.37. The loan to deposit average of 0.89 and equity to asset has a mean value of 14.49 with a standard deviation of 3.41. The sampled banks wrote off loans (bad debt) worth more than the sector average of 1.67 in the year 2016 (1.73) and 2017 (4.49)

Table 2: Descriptive statistics

Variable	Mean	Std. Div.	Min	Max
ROA	2.06	1.20	0.36	5.09
Tobin-Q	0.98	0.12	0.85	1.45
LLP	-2.59	3.09	-17.56	0.13
NPL	4.37	5.06	0.58	27.39

LDR	0.89	1.70	0.32	13.8
EAR	14.49	3.41	8.74	23.75
BLWO	1.67	4.54	0	35.08

Authors' computation 2018

Correlation statistics

The results of the correlation coefficient for the sampled banks are presented in Table 3. The result shows that return on asset has a correlation coefficient (r) of -0.2670 with a non-performing loan. Similarly, the correlation coefficient (r) of Loan to deposit ratio and Loan Loss Provision as it relates to return on asset is -0.0043 and 0.1862 respectively. This result implies that there is a significant negative correlation between return on asset and the non-performing loan. Also, the result of the correlation coefficient (r) between Bad Loan Written Off and return on asset -0.1867. This suggests that there is a significant negative correlation between Bad Loan Written Off and the return of asset of the sampled banks. Overall, the correlation matrices show that the correlation coefficients among the variables are less than 0.8, which suggests that there is no multicollinearity among the independent variables (Gujarati, 2004). The possible existence of multicollinearity was further tested by computing the variance inflation factor (VIF) of the explanatory variables. The result as presented in Table 4 shows that the VIF has a mean value of 1.33, which means that there is no issue about multicollinearity since the mean value of VIF is less than 10 (Gujarati, 2004).

Table 3: Correlation coefficient

Variable	ROA	Tobin-Q	LLP	NPL	LDR	EAR	BLWO
ROA	1.0000						
Tobin-Q	0.7221	1.0000					
LLP	0.1862	0.0580	1.0000				
NPL	-0.2670	-0.0948	-0.5122	1.0000			
LDR	-0.0043	-0.0757	0.0375	-0.0865	1.0000		
EAR	0.2918	0.0376	-0.0033	0.0919	-0.0664	1.0000	
BLWO	-0.1867	-0.1281	-0.2127	0.5216	-0.0138	-0.0312	1.0000

Authors' computation 2018

Table 4: Variance of Inflation Factor (VIF)

Variable	VIF	1/VIF
NPL	1.83	0.545054
BLWO	1.40	0.716274
LLP	1.37	0.730995
EAR	1.02	0.976586
LDR	1.01	0.988036
Mean VIF	1.33	

Authors' computation 2018

Regression analysis

Diagnostic checks

The regression analysis proceeds with the diagnostic checks of the normality using the Jarque–Bera test and the heteroscedasticity using the Breusch-Pagan / Cook-Weisberg test. The result of skewness and kurtosis test for normality as presented in Table 5 shows that all the variables of interest are normally distributed and the results are significant at the 5% level. On the other hand, the result of the Breusch-Pagan / Cook-Weisberg test for heteroskedasticity as presented in Table 6 shows that there is no issue about heteroscedasticity with a probability value of 0.0153. Thus, it is safe to use the dataset for inferences.

Table 5: Results of the Normality test

Variable	Obs	Pr (Skewness)	Pr (Kurtosis)	adj chi2(2)	Prob>chi2
ROA	60	0.0116	0.7727	6.05	0.0485
Tobin-Q	60	0.0000	0.0001	30.41	0.0000
LLP	59	0.0000	0.0000	39.45	0.0000
NPL	58	0.0000	0.0000	43.85	0.0000
LDR	60	0.0000	0.0000	.	0.0000
EAR	60	0.0083	0.1702	7.81	0.0202
BLWO	60	0.0000	0.0000	.	0.0000

Authors' computation, 2018

Table 6: Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Chi^2	$Prob > chi^2$
5.88	0.0153

Authors' computation, 2018

Discussion of Findings

In the analysis, the Hausman specification test was performed to determine which of the models between fixed and random effects would best explain the influence of credit risk management on bank performance in Nigeria. The Hausman test for fixed effects assumed that there is no correlation between the error term and explanatory variables, while that of the random effect considers a correlation between the error term and explanatory variables. The result of the Hausman test as reported in Table 7 shows that the probability value of the correlated random effect is greater than 5% (0.05) for the model. Thus, the test failed to reject the null hypothesis and conclude that the random effect model is more appropriate for the empirical discussion since Prob > chi2 is 0.7041. In other words, this result implies that the null hypothesis is accepted and the random effect is selected for the regression analysis and results to draw a conclusion. Table 8 shows the regression results of both the fixed effect and random effect results, though the analysis, conclusion and policy implications of this study will focus on the random effect results.

The result of the analysis as presented in Table 8 reveals that loan loss provision with a coefficient value of 0.111 and p-value of 0.105 has a positive but no significant relationship with return on asset. Also, the analysis showed that loan loss provision with a coefficient value of 0.213 and p-value of 0.046 is positively and statistically significant with Tobin Q at 5% level of significance. This result confirms the a priori expectation. The analysis reveals that non-performing loan with a coefficient value of -0.218 and p-value of 0.009 has a significant negative relationship with performance variable measured as return on asset. Using a different performance variable measured as Tobin Q, the result shows that non-performing loan with a coefficient of -0.104 and p-value of 0.420, has a negative but insignificant relationship with the market value of the bank proxy as Tobin Q. This outcome is contrary to studies by Ugoani (2016) and Lydnon et al., (2016). However, the result is consistent with the a priori expectation that there is no significant relationship between non-performing loan and profitability of commercial banks in Nigeria. This result suggests that as the non-performing loans accumulate, bank performance in terms of return on asset will

continue to decline in value, which may affect investors' confidence on the ability of the bank to maximize shareholders wealth. This result provides evidence that there is a lack of effective control, monitoring and supervision of loans and advances on the part of banks. In addition, it shows a clear weakness in the governance and institutional structures in the system.

Furthermore, the analysis reveals that the ratio of loan to deposit has a negative relationship with the performance of the sampled banks in Nigeria. This result as presented in Table 7 shows a coefficient of -0.046 and p-value of 0.398 for ROA and a coefficient of -0.064 and p-value of 0.452 for Tobin Q. The findings show that there is no statistically significant relationship between the performance variables measured as ROA and Tobin Q and loan to deposit. Thus, it is safe to reject the alternative hypothesis of a significant relationship between loan to deposit ratio and bank performance. With a coefficient value of 0.496 and a p-value of 0.000, there is empirical evidence to support a positive relationship between asset to equity ratio and return on asset as revealed from the regression analysis. This confirms the a priori expectation. However, it was observed that asset to equity has an insignificant relationship with market value proxy by Tobin Q. The outcome of the regression analysis shows that the amount of bad loan proxy as loan written off has no statistically significant relationship with banks profitability measured as ROA with a coefficient of 0.026 and a p-value of 0.679 and Tobin Q with a coefficient of 0.034 and a p-value of 0.731 respectively. This result is consistent with Asantey and Tengey (2014) and the study rejects the alternative hypothesis of a significant relationship between loan written off and firm profitability.

Table 7: Result of Hausman Specification Test

Test summary	**Chi^2**	**Prob > chi^2**
Cross-section random	0.26	0.7041

Authors' computation, 2018

Table 8: Results of the Regression analysis

Variable	**(1) ROA (FE)**	**(2) ROA (RE)**	**(3) Tobin-Q (FE)**	**(4) Tobin-Q (RE)**
LLP	0.112*	0.111	0.235*	0.213*
	(0.123)	(0.105)	(0.036)	(0.046)
NPL	-0.214*	-0.218**	-0.106	-0.104
	(0.018)	(0.009)	(0.429)	(0.420)
LDR	-0.049	-0.046	-0.065	-0.064

	(0.393)	(0.398)	(0.456)	(0.452)
EAR	0.521***	0.496***	0.158	0.117
	(0.000)	(0.000)	(0.423)	(0.482)
BLWO	0.025	0.026	0.042	0.034
	(0.701)	(0.679)	(0.672)	(0.731)
N	58	58	58	58
R-sq	0.454		0.199	
adj. R-sq	0.277		-0.061	

Standardized beta coefficients; p-values in parentheses * p<0.05, ** p<0.01, *** p<0.001

Conclusion and Recommendations

This study examines the effect of credit risk management on the performance of commercial banks in Nigeria. The study employed the panel data regression technique to analyze data for the period 2012 -2017. The results of the random effect models established that non-performing loan and loan loss provision impact on banks' performance measured as return on asset and Tobin-Q. This result reveals that Non-Performing Loan and loan to deposit have a negative effect on bank performance, which suggests the need for banks to establish an efficient means of control, monitoring and supervision mechanisms to minimize the effects of non-performing loan on performance. This result shows that loan loss provision has a positive effect on bank performance. The study provides evidence that credit risk management indicators are important variables to explain bank performance in Nigeria.

Following the findings from the empirical analysis, the study recommends that

I. Nigerian commercial banks should improve their credit risk system that allows the operationalization of a sound credit granting process and administration. This can be done by promoting an efficient control, monitoring and supervision system of loans and advances.
II. Regulators such as the Central Bank of Nigeria should consider a combination of ratios and changes in trends of specific items such as nonperforming loan to loans and advances ratio, equity to asset ratio and loan to deposit ratio as a reporting system. This will assist in revealing the bank's credit risk status.

III. Management of commercial banks should put in place good credit appraisal procedures and effective internal control systems to mitigate the effect of moral hazard and adverse selection of customers.

This study used current data to analyze some important variables of commercial banks and shield further understanding to credit risk management and performance of banks in Nigeria. However, future research work is important to expand the scope of this work, which could include other parameters that are used to measure performance and credit management of commercial banks. Finally, other factors such as the interest rates charged on the loans and the diversification of portfolios and their relationship to the overall profitability of commercial banks can be considered for future studies.

References

Ali, S. & Iva, S. (2013). Impact of bank specific variables on the non–performing loans ratio in Albanian Banking System*, Journal of Finance and Accounting 4(7).*

Aminu, Y. (2012). Determinants of IMs as a component of working capital in ensuring corporate profitability: A conceptual approach. *Research Journal of Finance and Accounting*, 3(11), 58−61.

Asantey J. O. & Tengey, S. (2014). An empirical study on the effect of bad loans on banks' lending potential and financial performance: The case of SMEs lending in Ghana, *International Journal of Research in Business Management*, 2(11), 1-12

Basel Committee on Banking Supervision (1999). A new capital adequacy framework, June.

Basel Committee on Banking Supervision (2001). Principles for the management of credit risk, CH–4002 Basel, Switzerland Bank for International Settlements

Boland. O. (2012). Managing risk on global basis. *Journal of Accounting and Finance*, 12(1), 13-30.

Chege L. M. & Bichanga. J. (2017). Non-performing loans and financial performance of banks: An empirical study of commercial banks in Kenya, *International Journal of Management and Commerce Innovations,* 4(2), 909-916

Ezirim C. W. (2005). Co-integration and error correction: Representation, estimation and testing. *Econometrica*, 55, 251-276

Godlewski, C. J. (2004). Bank capital credit risk taking in emerging market economic*. Journal of Banking Regulation, 6(2), 128-145*

Greuning, H., Bratanovic, S. B. (2003). Analyzing and managing banking risk: A Framework for assessing corporate governance and financial risk. 2nd ed. Washington, DC: The World Bank.

Gujarati, D. (2004). *Basic Econometrics* 4th ed. McGraw−Hill Companies.

Horner, D. (2013). *Accounting for Non-Accountants*. London: Kogan Page.

Hosna, A. & Manzura, B. (2009). Credit risk management and profitability in commercial banks in Sweden, University of Gothenburg, Graduate School of Business, Economics and Law, Master of Science in Accounting.

Iwedi, M. & Onuegbu, O. (2014). Credit risk and performance of selected deposit money banks in Nigeria: An empirical investigation. *European Journal of Humanities and* Social Sciences, 31(1), 1685-1694.

Kargi, H. S. (2011). Credit risk and the performance of Nigerian banks, Ahmadu Bello, University, Zaria.

Lydnon M. E., Ayunku, P.E. & Ebitare L. M. E (2016). The impact of non-performing loans and bank performance in Nigeria, *International Journal of Humanities and Social Science Invention, 5(4), 1-5.*

Nawaz, M., Munir, S., Siddiqui, S. A., Tahseen-ul-Ahad, F. A., Asif, M., & Ateeq, M. (2012). Credit risk and the performance of Nigerian banks. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(7), 49-63.

Ogboi, C., & Unuafe, O. K. (2013). Impact of credit risk management and capital adequacy on the financial performance of commercial banks in Nigeria. *Journal of Emerging Issues in Economics, Finance and Banking*, *2*(3), 703-717.

Ojo, J. A. T. (1999). Roles and failures of financial intermediation by banks. *CBN Bullion*, 23(3), 10-12.

Onaolapo, A. R. (2012). Analysis of credit risk management efficiency in Nigeria commercial banking sector (2004-2009). *Far East Journal of Marketing and Management*, *2*(4), 39-52.

Osuka, B. & Amako, J. (2015). Credit management in Nigeria deposit money banks: A study of selected deposit money banks. *International Research Journal of Education and Innovation* (IRJEI), 1(3), 66 – 103

Owojori, A. A., Akintoye, I. R. & Adidu, F. A. (2011). The challenge of risk management in Nigerian banks in the post consolidation era. *Journal of Accounting and Taxation*, 3(2), 23-31.

Saba, I., Kouser, R. & Azeem, M. (2012). Determinants of non-performing loans: Case of US banking sector, *International Journal of Banking and Finance,* (44) 479-488

Salas, V. & Saurina, J. (2002). Credit risk in two institutional regimes: Spanish commercial and savings banks, *Journal of Financial Services Research*, 22(3), 203-224

Shafiq, A. & Nasr, M. (2010). Risk management practices followed by the commercial banks in Pakistan*, International Review of Business Research Papers,* 6(2), 308-325.

Taiwo A.M. & Taiwo A.S (2014). An empirical evidence on the impact of credit management, liquidity position and profitability of Nigerian banking sector. British Journal of Business and Management Research, 1(2), 12-21,

Taiwo J. N; Ucheaga, E. G; Achugamonu, B. U; Adetiloye, K.; Okoye, L. & Agwu, M. E (2017). Credit risk management: Implications on bank performance and lending growth, *Saudi Journal of Business and Management Studies*, 2(5B), 584-590.

Ugoani J. N. (2016). Nonperforming loans portfolio and its effect on bank profitability in Nigeria, *Independent Journal of Management & Production, 7(2), 303-319.*