Amity Journal of Management Research

Credit Risk, Market Risk and Financial Performance of Selected Deposit Money Banks in Nigeria

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Abstract

Effective mitigation of credit risk and market risk is vital for the well-being of banks as it has the propensity of either making or marring the sustainable performance of the banks. Against this backdrop, the study examined the effect of credit and market risk on the financial performance of twelve (12) deposit money banks that are listed on the floor of the Nigerian stock exchange. The study covered the period of 2008-2017 being the time of stock market crisis, corporate governance and recession problem. The data used was obtained from the financial reports of the twelve selected banks and Nigerian stock exchange publications. The collected data was analyzed employing random effect model. The study used return on equity (ROE) to proxy banks financial performance; non-performing loans ratio and loan loss provisions ratio as proxies for credit risk; and net interest income ratio and foreign currency ratio as proxies for market risk. The findings revealed that Non-performing loan ratio (credit risk) has negative statistically significant effect on return on equity (β=--0.165, $p<0.01$). Loan loss provision ratio (credit risk) also has negative statistically significant effect on return on equity (β=-0.738, $p<0.01$). Foreign currency ratio (market risk) has statistically significant effect on return on equity (β=-0.233, $p<0.05$). Meanwhile, Net interest income ratio (market risk) has positive statistically significant influence on return on equity (β=0.050, $p<0.10$). Total assets have positive statistically significant influence on return on equity (β=0.050, $p<0.10$). The study concluded that credit and market risks exert significant influence on Nigerian deposit money banks' financial performance. Accordingly, it is recommended that the Nigerian banks should be more proactive in the assessment and management of credit risk together with market risk with a view to mitigating their exposure to these risks as well as enhancing their financial performance.

Key words: Credit Risk, Market Risk, Banks Profitability, Panel Estimation

JEL Classification: C33, G32, L12

Paper Classification: Research Paper

Introduction

The banking sector of every country is central to the growth and development of its economy as it performs the roles of an intermediary between lenders and borrowers. In performing these roles several financial crises were encountered like that of the global financial crisis which started at the middle of 2007 in the United State of America and that of banking crisis of 2008 that affected both developed and developing countries. Those crises that were likened to poor credit, sub-prime loans or mortgages instant default and market instability led to the collapse of most financial institutions and their subsequent closure. This has continually informed the growing interest in the beaming of search light on credit risk and market risk issue. The high exposure of banks to credit risk and market risk has resulted in a number of bank failures that has led to some of them being merged or facing extinction (Olusanmi, Uwuigbe & Uwuigbe, 2015; Okere, Muideen, & Ogunlowore 2018; Oduro, Asiedu & Gadzo 2019).

Several studies on banking crises in different economies dwelled much on credit risk and market risk as among the prominent risks that affected banks sustainability. Based on Basel Accord credit risk and market risk are fundamental risks that faces banks or any other regulated institutions when operating in the market. Li and Zou (2014) and Badawi (2017) are also of the opinion that these categories of risks pose a great deal of threat to the survival of banking institutions.

Credit risk according to Oduro*et al* (2019) needs to be effectively mitigated as credits form a significant chunk of bank asset and so their associated risks represent the most significant risks that the banks encounter. The risk has the propensity of disparaging or sustaining the prosperity of the banks. A sizeable proportion of financial distresses experienced by most banks are partly products of high default risk exposure (Wijewardana&Wimalasiri2017; Nwude & Okeke, 2018). Odawo, Makokha, and Namusonge,(2019) stressed further that risk associated with loan facilities are the widely reported credit risk that subsist in the banking trading book, and on and off-balance sheet items are loans.

Market risks are risks that arise from price variations in the financial market resulting in fluctuations in interest rates, foreign exchange rates, equity and commodity prices. Accordingly, Market risks are classified to include foreign exchange risk, interest rate risk, commodity price risk and stock price risk (Kassi, Rathnayake, Louembe, &Ding, 2019). The Basel 1 as Amended in 1996 supported the reality that the existence of market risk serves as a threat not only to the banking sector but also to the country's economy. Consequently, banks' profit level is influenced by the capacity of the banks to control the risks related to credit and financial markets (Li &Zou, 2014).

Banks are prone to risk of market through their balance sheet and trading activities that involves interest rates or rate of exchange (Paulinus& Jones, 2017). Bikker and Vervliet (2017) assert that those risks may constitute a major threat to banks' survival in the market therefore efficient management of them is absolutely required for all banks. The industry is highly controlled due to its riskiness of operation.

The main objective of banks is to maximize owners' equity through the advancement of loans to customers; this function undoubtedly helps in financing the activities of private businesses to help build the national economy (Olusanmi*et al.*, 2015). However, this function exposes the banks to different kinds of risks among which are market risks and credit risks. Credit risk analysis and market risk appraisal generally need to receive serious attention as a result of the financial instability in global economy. The crises of 2009, 2010 and 2016 witness high exposition to credit risk, market risk, weak and isolated financial system in Nigerian banking sector together with

poor regulation and supervision that affected their profitability (Marchettini, Macagni & Maino 2015).

Banks face credit risk when the securities pledge fails to match the principal payment plus the other incurred assets like cash flows as stated in terms of the credit arrangement. The payment may possibly be deferred or remained due which could restrict effective cash flow and as a result restrain the identified level of liquidity experienced by the bank. Banks also encounter market risk when the price of investment change due to alteration in the rate of interest and rate of foreign exchange as a result of mismatch between the asset cost and the price of capital and liabilities in different currencies.

Business activities become complicated in the recent world as financial institutions are bedeviled by myriads of risks prominent among which are associated with credit and market risk. These pockets of risks, so to say, constitute major threats to the survival of banks as experienced in Nigeria in recent times. Consequently, the lack of wherewithal to curtail those risks due to their mismanagement and poor administration could spell doom on the overall financial results of banks. Evidently in Nigeria, bank failure is a common place and this scenario has always been blamed on unscrupulous loan management practices locally and internationally. So, the incorporation of sound credit risk and market risk management into the deposit money bank practices is fundamental (Olalere & Wan, 2016). Hence, the study examines the effect of credit risk and market risk on financial performance of deposit money banks in Nigeria.

In line with the above objective the following hypotheses were put forward and tested,

H_1: Credit risk has no significant effect on financial performance of deposit money banks in Nigeria.

H_2: Market risk has no significant effect on financial performance of deposit money banks in Nigeria.

Literature Review

Risk is a doubt or indecision of an outcome that has an adverse impact on the achievement of banks objectives. It includes an opportunity as well as a threat. Paulinus and Jones (2017) stressed that risk is a probability, threat and negative occurrence caused by outsider or insider weaknesses that can be circumvented through proactive action. Also, Fabrice (2018) opined that taking risk is part of the essence of management which should not be taken unnecessarily and foolishly. Risk influences banks' profitability and market value conditioned by level of risk exposure (Harelimana, 2017).

Odawo*et al.* (2019) postulated that the potential where contractual party has failed to meet its commitments in accordance with the approved terms is referred to as credit risk. The potential loss encountered from the inability of a borrower to pay its debts in line with approved terms and to service the loan plus interest charged is a risk arising from credit (Nwude & Okeke 2018; Okere*et al.*, 2018). However, there have been complaints about the inability to meet obligations, inadequate controls, and high rate of defaulters among others. Therefore, the study sought to analyze the extent to which banks' financial result in terms of return on the equity is affected by credit risk (Nonperforming loan ratio, loan loss provision ratio).

According to Basel Committee on Banking Supervision (BCBS) (1993) market risk arises from the loss encountered through the movement in market prices of on and off-balance sheet items including rate of interest, rate of exchange and equity prices. Tian (2017) further extended that

market risk is a possible loss from unpredicted movements in financial instruments that are operated in an open market. Mohd. Ab-Hamid, Abdul-Rahman, Abdul-Majid and Hawati (2018) reported in their study that Basel Committee on Bank Supervision has implemented expected shortfall to replace value at risk as the advanced risk measure for market risk. Generally, market risks are beyond the capacity of the banks as they are usually occasioned by the economy wide determinants (Aruwa& Musa 2014). Foreign exchange currency exposure and market interest rate serve as indicators for market risk.

In the body of literature reviewed bank performance is represented mainly by quantifiable financial indicators (Shoukat & Nadeem 2017; Bagh, khan, &Razzaq 2017). Bank performance shows the banks' ability to accommodate risk, increase capital base, measures quality of bank management likewise the financial capability to compare various financial institutions in the industry (Odawo*et al.,* 2019). The literatures on bank performance have closely tied bank financial performance to profitability measures by return on assets (ROA), returns on equity (ROE) and net interest margin (NIM) (Soyemi, Ogunleye&Ashogbon, 2014; Olusanmi*et al*., 2015; Okere*et al*., 2018). The study chose to measure its bank performance with returns on equity as it underscores the shareholders' wealth maximization of the firm.

Bank management has the potentiality to increase shareholders returns which come at the cost of increasing credit. This objective motivates credit risks which come from increasing credit and it can lead to banks underperformance (Olusanmi*et al.,* 2015). An exorbitant increase in credit risk suggested possible weakening of bank profitability to the extent of having adverse relationship with investment returns. Good loan suffers from provisions made because it is directly deducted from its proceeds. (Oduro*et al.,* 2019). Non-performing loans is a components of credit risk which are categorized as impaired loan loss that if not managed leads to liquidity crunches. Studies of Adeusi, Akeke, Adebisi and Olagunju (2014) and Soyemi*et al.* (2014) reported in their findings that nonperforming loan ratio (credit risk) is negatively and significantly associated with the return of equity of Nigerian banks. Ozili (2017) viewed loan default as a catastrophe that bedeviled bank's profitability to the extent of eating deep into the dividend of shareholders and equally affecting capital mobilization and discouraging investors from undertaking an investment with the banks with enormous non-performing loans portfolio. At the same times market risks affect the price of investment (investment portfolio or a trading portfolio) negatively owing to the decrease in market risk factors. Measures of standard risk of market factors are price of stock, rates of interest, rates of foreign exchange, and commodity values (Tassew & Hailu, 2019). However, the study adopted two variables to measure the effect of market risks, namely interest rate risk and foreign exchange risk.

A Study on commercial banks in Bangladesh by Noman, Sajeda, Mustafa and Hasanul (2015) found robust significant negative effect of non-performing loan and loan loss provision on the banks' profitability for the period between 2003 and 2013. Specifically, their findings also revealed further that while Basel II implementation significantly and positively affects the Bangladesh banks' Net interest margin, their return on equity is negatively affected. Similarly, Almekhlafi, Almekhlafi, Kargboand Hu (2016) also revealed that the profitability of Yemen banks negatively and significantly relates with Non-performing loans and that credit risk management has similar effect across banks performance.

Ekinci (2016) in his study examines the effects of credit and market risk (proxied with interest rate and foreign exchange rate risk) on the bank performance of the Turkish banking sector. The study employed generalized autoregressive conditional heteroscedasticity approach for the 2002-2015 periods by using weekly data. The results revealed that credit and market risk have

significant positive effect on conditional bank stock return volatility.

Saeed and Zahid (2016) believed that the UK banks attained improved performance after the global financial crisis and recommended that the bank should learn how to tackle the credit risk over the years with a view to achieving better results. The study reported that credit risk indicators had a positive association with profitability of the banks as there is interlink between bank size, leverage and growth.

Isanzu (2017) in his study of the impact of credit risk on the financial performance of Chinese banks concluded that there is a need to control credit risk as it is crucial for Chinese bank financial performance. The study showed that nonperforming loan and capital adequacy have a significant impact on financial performance of Chinese commercial banks. Nwannaand Oguezue (2017) reported contrary finding in their study where it was found that non-performing loan exert insignificant influence on Nigerian banks' profitability.

MohdAb-Hamid *et al.* (2018) examined the market risk and effects of cost and profit efficiencies on market risk using all listed banks in Malaysia for the 2000–2015 period. The study used the Expected Shortfall and Stochastic Frontier Analysis, to estimate the cost and profit efficiencies and analyze the effects on market risk. It was found that as the bank market risk exposure decreases both cost and profit efficiencies exert significant influence on the market risk.

Nwudeand Okeke (2018) in their exploratory study of the nexus between credit risk management and performance of deposit money banks in Nigeria reported positive and significant relationship between credit risk management and total loans and advances, return on assets and return on equity of the deposit money bank. The study used five banks that had highest asset base for the period 2000–2014 and adopted ordinary least square regression model.

Oduro*et al.* (2019) employed two Stage Least Square models on Ghanaian banks data and reported that a rise in the bank credit risk adversely influences corporate financial performance. Kassi*et al.* (2019) in their study concluded that market risk indicators have a negative significant influence on the financial performance as they examined market risk and financial performance of non-financial firms in Casablanca for the period 2000-2016. The study employed the pooled panel models and GMM models.

A review of Nigerian literature revealed that research on the effect of risk management on bank performance which combines credit and market risk as a measure of risk management in a single study is close to non-existence.

In addition, it was observed that no studies in Nigeria have ever used foreign currency liability and foreign currency assets to measure foreign exchange risk. Hence, there exist gaps and unanswered questions in this in the Nigerian context.

Theoretical Framework

This study was anchored on Modern Portfolio Theory as it seeks to examine effect of credit risk and market risk on the financial performance of deposit money banks in Nigeria. Markowitz (1952) postulated that Modern Portfolio Theory is an investment theory of trade-off between risk and returns. The theory highlighted the duty of management in selecting investments at an efficient frontier line which produces a higher return. Modern portfolio theory classified risks as systematic and unsystematic. A risk of market that cannot be related or mitigated is systematic risk whereas the unsystematic risk (credit risk) is managed through diversification. The central thesis behind the Markowitz's theory was that a diversified portfolio is better than a portfolio

chosen strictly based on the investment with the highest return. Modern Portfolio Theory does not guarantee protection against loss. Though diversification does help lower risk (credit risk and market), it is not a guarantee that investors will not encounter loss from which ever investment selected. The theory maximizes returns by minimizing credit and market risk. Diversifying does not lower expected return but spread risk for investors to achieve the desired returns.

The theory suggests that stakeholders understand risk and return as directly connected and so it becomes necessary for them to undertake greater risk in order to receive higher returns. The theory proposes that diversifying can reduce the risk without reducing returns, but an investor should select the portfolio with lesser risk without forfeiting the return. The theory was criticized on the ground that technical analysis offers better understanding rather than buy and hold philosophy that theory subscribes as the best to maximize returns. Despite its criticism some researchers (such as Bagh*etal.,* 2017; Onyema & Odeiem-Ogulu, 2019) still find the theory useful to analyze risk management. Consequently, the study believes the banks performance is a function of their capacity to mitigate the credit and market risk.

Methodology

This research work employed *ex-post facto* research design to examine the effect of credit risk and market risk on financial performance of deposit money banks in Nigeria. This research design was adopted because the data used were already in existence in the annual report and accounts of the sampled banks. The population for this study comprises all the fifteen (15) deposit money banks listed on the floor of the Nigerian Stock Exchange as at 31st December 2017. Purposive sampling technique was employed. The criteria used in selecting the sampled banks for the study was based on the geographical coverage. As such banks with international and national business coverage were included in the study. Consequently, only twelve (12) listed banks scaled through the conditionality. As a result, all the qualified listed banks constitute the sample size. The research data were obtained from the annual financial reports and accounts of the sampled banks from 2008 to 2017.

The study employed both descriptive and inferential statistics in analyzing the data. The descriptive statistics including the mean, standard deviation, minimum, maximum and skewness and kurtosis were used. Inferential statistics specifically, Panel regression analysis was employed to proffer answer to research questions as well as test the research hypotheses. This technique was used considering the nature of the data collected for the study as it is in form of longitudinal data which comprise time series and cross sectional data of twelve banks over ten years period (that is one hundred and twenty banks year observation). Hausman test of specification was conducted and its significance suggested the use of random effect model.

Model Specification

The study adapted the model of Ekinci (2016) which modelled banks' performance as a function of credit risk, interest rate and foreign exchange rate. The interest rate and foreign exchange rate were used to proxy market risk.

Return = *f* (Credit risk, Interest Rate, Foreign Exchange Rate). 1

$$\text{Return} = \beta_0 + \beta_1 CR_{it} + \beta_2 INT_{it} + \beta_3 FX_{it} + \mu_{it} \quad \text{.....2}$$

However, the current study made an improvement on the model using return on equity as dependent variable and credit risk measured by nonperforming loan ratio and loan loss

Provision ratio, and market risk measured by net interest income ratio and foreign currency ratio as independent variables. The study also includes natural log of total assets that is bank size as control variable.

Therefore, the model functional form becomes:

ROE= *f*(NPLR, LLPR, NIIR, FCR, LTAS) 3

The above functional form is transformed to mathematical form as;

$ROE = \beta_0 + \beta_1 NPLR_{it} + \beta_2 LLPR_{it} + \beta_3 NIIR_{it} + \beta_4 FCR_{it} + \beta_5 LTAS_{it} + \mu_{it}$ 4

Where; β_0 = Constant term, β1 – β5 = Coefficients of independent variables, subscript "it" = cross sectional and time series indication, μ_{it} = error term, ROE = return on equity (profit after tax / equity capital), NPLR = Non performing loan/total loan and advance, LLPR = Loan loss provision / loan and advance ratio, NIIR = net interest yield / interest bearing assets ratio, FCR = Net foreign currency liabilities/Net foreign currency assets, LTAS = natural log of total assets.

Results and Discussion

This section covers descriptive statistic, multicollinearity test, stationarity test, specification test, regression analysis hypotheses testing and discussion of findings

Summary of Descriptive Statistics of the Study Variables

The Table 1 below shows descriptive statistics of the study data. It contains mean, standard deviation, minimum, maximum and skewness and kurtosis which provide a snapshot of both dependent and the independent variables.

Table 1: Summary of the Descriptive Statistics

Variable	Observation	Mean	Maximum	Minimum	Standard dev	Skewness	Kurtosis
ROE	120	0.1020	0.3008	-1.1271	0.1733	-0.779	0.356
NPLR	120	0.2823	1.1049	0.0089	0.3165	-0.291	0.527
LLPR	120	0.0659	1.1051	0.0009	0.1249	-0.419	0.330
NIIR	120	0.4584	4.7336	0.0178	0.6587	0.948	2.061
FCR	120	2.1930	6.8362	0.6498	2.2840	0.051	1.152
LTAS	120	4.7046	6.7190	0.0387	2.5037	-0.718	0.033

Source: Authors' computation (2019)

The result in Table 1 above shows that bank profitability measured through return on equity, has an average value of 10.20% with a standard deviation of 17.33%, and minimum and maximum values of -112.7% and 30.08% respectively. The mean value implies that the banks, on average, contribute 10.20% to profit of their respective banks during the period under review. The standard deviation of 17.33% indicates there is wide dispersion of the data from the mean value. The minimum and maximum value of -112.7% and 30.08% implies that, during the period under study, the minimum return on equity was -112,7% and the highest return on equity recorded by the sampled banks was 30.08%.

Also, Table 1 reveals that the mean value of nonperforming loan ratio is 28.23% while the standard deviation is 31.65% minimum and maximum values of 0.89 and 110.5%. Mean value indicates that the sampled banks have an average of 28.23% of nonperforming loans on their

portfolio during the period under review. Also, the mean value of loan loss provision ratio is 6.59% standard deviation of 12.49, minimum and maximum 0% and 110.5%. The minimum value of 0%-0.89% of nonperforming loans and loan loss provision implies that some banks do not have much nonperforming loan/loan loss provision while the year with highest nonperforming loans was when the banks have 110.5% respectively that is when the banks were facing financial crisis and recession. This indicates that banks have controlled their credit risk exposures as ordered by the regulatory bodies.

Net interest income ratio (NIIR) showed an average of 45.84% with a standard deviation of 12.49%. This reveals considerable improvement in the banks earning capacity for the period covered in the study. This perhaps is a pointer to the fact that loans and advances, which are lent out at an average cost of 45.8%, constitute a large chunk of banks interest bearing assets during the study period. The foreign currency ratios of all banks that proxied the market risk have an effective performance with mean value of 219.3% standard deviation of 228.4%, minimum value of 64.98% and maximum value of 683.6%. Therefore,the study indicates that the banks under the study earned more from the foreign currency transactions as they invested more on it.

The average total asset of the banks recorded 470.5% and a standard deviation of 250% with minimum and maximum values ranging from 3.9% to 672%. This is also an indication that sizeable number of risky assets was held by the banks and this explains the higher returns in form of relatively greater interest income associated with such assets.

The coefficients for skewness and kurtosis statistics reveal that the data are normally distributed as their values are within the cut of point of -3 and 3. The rule of thumb of either ±2 or ±3 has wide applications in the literature. Thus, the results obtained from Table 1 show that the data for all the variables observed are normally distributed as their values are within the range of -3 to +3 (Ho & Yu, 2015). Therefore, parametric statistical analysis can be conducted for the study.

Multicollinearity Test

The pairwise correlation result presented in Table 2 indicates that none of the relationships among the independent variables have correlation coefficient even up to 0.6. For instance, the correlation coefficients between Nonperforming loan ratio and Loan loss provision, Non-performing loan ratio and Net interest income ratio, Nonperforming loan ratio and Foreign currency ratio, and Nonperforming loan ratio and log of total assets are 0.11618, -0.15891, 0.76593 and -0.05980 respectively. Also, correlation coefficients between Loan Loss provision and Net interest income ratio, Loan Loss provision and Foreign currency ratio, and Loan Loss provision and log of total assets are 0.18724, -0.07021 and -0.23294 respectively. In addition, the coefficients for Net interest income ratio and Foreign currency ratio, and Net interest income ratio and log of total assets are -0.23698 and -0.25618 respectively while the coefficient between Foreign currency ratio and log of total assets is 0.03125.

Table 2: Pairwise Correlation

Variable	ROE	NPLR	LLPR	NIIR	FCR	LTAS
ROE	1					
NPLR	-0.19265	1				
LLPR	-0.71295	0.11618	1			
NIIR	-0.04305	-0.15891	0.18724	1		
FCR	0.06353	0.76593	-0.07021	-0.23698	1	

LTAS	0.10833	-0.05980	-0.23294	-0.25618	0.03125	1

Source: Authors' Computation 2019

The general rule stated that correlation coefficient of 0.8 and above is a signal of the presence of multicollinearity.Consequently, the result suggests that multicollinearity problem is not severe or nonexistent (Field, 2005; Kennedy, 2008).

Stationarity test

The study conducted stationarity test to determine whether the underlying properties of the process to generate the cross-sectional time series variables in our model were stationary or non-stationary. Cross sectional data often possess stochastic trends that can be removed by differencing the variables. Therefore, the Levin, Lin & Chu t* is employed to test the order of integration of the variables. The Levin, Lin & Chu test* results are displayed in Table 3:

Table 3: Panel Unit Root Result

Variables	At level	At first difference	Order of Integration
Returns on equity	-6.2519*	-8.8167*	I(0)
NPLR	-4.8982*	-1.9878	I(0)
LLPR	-4.8040*	-0.4892	I(0)
NIIR	-6.1805*	-6.7760*	I(0)
FCR	-4.8930*	-3.7992*	I(0)
LTAS	-3.1170*	-2.9365*	I(0)

**Indicates the critical value is based on 5% significance level*

Source: Authors' Computation 2019

Table 3 above shows that all variables are stationary at level with an integration order of zero. At first difference only three variables are stationary that is returns on equity, net interest income ratio and foreign currency ratio while the remaining variables such as nonperforming loan ratio, loan loss provision ratio and log of total assets are not stationary.

Specification test

Table 4: Hausman Test

Variable	Chi-Square	P-value
Model	15.07	0.0101

Source: Authors' Computation, 2019

The model specification test in Table 4 illustrates the result of Hausman statistics. The probability value of 0.0101 is less than the chi-square statistics of 15.07 at 0.05 (that is 5% significance level). This is an indication of the failure of the study to reject the null hypothesis and thus the adoption of the random effect model for the study analysis.

Hypotheses Testing

The study hypotheses are restated in null forms and tested as follows:

Table 5: Summary of Test of Hypotheses

Variables	Coefficients	P-value	Decision	Conclusion
NPLR	-0.165468	0.0041	P-value <1%	Significant
LLPR	-0.738947	0.0000	P-value <1%	Significant
NIIR	0.049824	0.0474	P-value < 5%	Significant
FCR	-0.232926	0.0982	P-value <10%	Significant
LTAS	0.049692	0.0921	P-value <10%	Significant

Source: Authors' Computation, 2019

Hypothesis 1: Credit risk has no significant effect on financial performance of deposit money banks in Nigeria.

Table 5 shows the nonperforming loan has a negative coefficient of -0.165 with a p-value of .004 which implies that it is statistically significant at 1% level. Thus, the null hypothesis that nonperforming loan, as a proxy of credit risk, has no significant effect on financial performance of deposit money banks in Nigeria is rejected. The implication of such rejection is that nonperforming loan exerts negative and significant effect on financial performance of deposit money banks in Nigeria. Loan loss provision also has negative coefficient of -0.739 with p-value of less than 1%, which is also statistically significant at 5% level. Therefore the null hypothesis is rejected and the alternative that loan loss provision, as proxy of credit risk, has a negative and significant effect on financial performance of deposit money banks in Nigeria, is accepted. It is therefore found, based on the study results, that credit risk proxied by nonperforming loan and loan loss provision exerts significant negative effect on financial performance of deposit money banks in Nigeria.

Hypothesis 2: Market risk has no significant effect on financial performance of deposit money banks in Nigeria.

Table 5 also shows that net interest income ratio has a positive coefficient of 0.0498 with p-value of 0.0474 indicating statistical significance at 5% level. Thus, the null hypothesis that market risk (proxied by net interest income ratio) has no significant effect on financial performance of deposit money banks in Nigeria is rejected and the alternative is accepted. Hence, it is asserted that net interest income ratio has a positive and significant effect on the financial performance of deposit money banks in Nigeria. Also, foreign currency ratio with a negative coefficient of 0.233 and a p-value of 0.0982 is statistically significant at 10% level. We reject the null hypothesis and accept the alternative hypothesis that market risk (proxied by foreign currency ratio) has a significant negative influence on financial performance (return on equity) of deposit money banks. Based on these findings, a statistically significant effect of market risk proxied by net interest income ratio and foreign currency ratio on financial performance of deposit money banks in Nigeria, is affirmed . Log of total assets also has positive coefficient of 0.0497 with p-value of 0.0921 that is statistically significant at 10% level.

Table 6. Summary of the regression results of ROE Model

Variables	Coefficient	Std Error	t- Statistics	P-Value
C	-0.058735	0.343785	-0.170848	0.8647
NPLR	-0.165468	0.056339	-2.937004	0.0041***
LLPR	-0.738947	0.094905	-7.786199	0.0000***
NIIR	0.049824	0.024828	2.006771	0.0474**

FCR	-0.232926	0.098222	0.098222	0.0982*
LTAS	0.049692	0.029229	1.700050	0.0921*
R-squared	0.668575	F- (Statistics)	12.98621	
Adj R-squared	0.617092	Prob F- (statistic)	0.0000***	
S.E.of regression	0.107261	Durbin-Watson stat	1.892	

*P value*** < 0.01, P value**< 0.05 and P value*<0.1*

Source: Authors' Computation, 2019

The result presented in Table 6 showed that coefficient of determination(R^2) value of 66.9% with an adjusted R^2 of 61.7% depict that approximately 67% of the total variation in return on equity could be attributed to or explained by the variation in all of the independent variables and that the model is a good fit for the variation. This also means that nonperforming loan, loan loss provision, net interest income ratio, foreign currency ratio and log of total assets within the model explain 66.9% of the financial performance of the banks. The F-statistic was 12.986 and the p-value of less than 1% (0.0000) level of significance. This indicates that there is positive relationship between independent variables and dependent variables of the return on equity. The Durbin-Watson statistic gives a value of 1.892 which validates the suitability of data for the regression model and further reveals that the regression equation is free from the problem of autocorrelation

Discussions of Findings

Regression result was employed to examine the effect of credit and market risk on financial performance of selected deposit money banks in Nigeria during the time period of 2008-2017. Based on the results of analysis, Nonperforming loan ratio (NPLR) has negative effect on the financial performance of deposit money banks (ROE) as shown by a regression coefficient of -0.165 which is statistically significant at 1%. This is an indication that a percent point increase in nonperforming loan ratio would lead to decrease in return on equity of deposit money banks by 16.5 percent. This agrees with the apriori expectation of non-performing loan. The finding concurs with that of Isanzu (2017) and Tassew & Hailu (2019) who found a negative significant impact of credit risks on banks performance. This may be blamed on deficient credit risk administration. But in contrary with the work of Olusanmi *et al.* (2015), Wijewardana & Wimalasiri (2017) who reported that credit risk has nothing to do with bank performance.

Loan Loss Provisions Ratio (LLP) also has negative effect on financial performance (ROE) of the deposit money banks as shown by a regression coefficient 0.739 which is statistically significant at 1%. This means that a per cent point increase in Loan Loss Provisions brings about 73.9 decreased in return on equity of deposit money banks. Thus, there is not enough provision made against DMBs' loan losses which agrees with the a-priori expectation of loan loss provision. The finding is in consistence with results of Saeed & Zahid (2016), Annor and Obeng, (2017) and Ahmad (2017).

Net interest income ratio has a positive effect on the financial performance of deposit money banks (ROE). This is shown by a regression coefficient of 0.050 which is statistically significant at 5%. This connotes that a per cent point increase in Net interest income ratio would lead to increase in return on equity of the deposit money banks by factor of 0.050. This indicates that the increase in net interest income ratio has improved DMBs' profitability by 5 per cent. This finding aligns with the works of Olalere and Wan (2016) and Badawi (2017).

Foreign currency ratio has negative effect of about 0.233 on the financial performance of deposit money banks. The effect is statistically significant at 10% and this implies that a unit

increase in foreign currency ratio would lead to decrease in return on equity by 23.3 per cent. This indicates that foreign currency shock affects the profitability of banks. Tassew and Hailu (2019) also reported similar finding while Oduro *et al.* (2019) reported a contrary finding.

Log of total asset also has positive effect on financial performance of deposit money banks. This is shown by a regression coefficient of 0.0497 which is statistically significant at 10% level that is a percent increase in total assets would lead to 0.000497-unit increase in return on equity. This implies that increase in total assets is positive to the financial performance of deposit money banks. This result is in line with the work of Tassew and Hailu (2019) but contrasts the findings of Nwude and Okeke (2017) and Harelimana (2017).

Conclusion and Recommendations

Based on the findings, it is concluded that credit and market risk exerts influence on the financial performance of the Nigerian deposit money banks.

In line with the findings, it is recommended that Nigerian deposit money banks should be more concerned in terms of monitoring and controlling of their non-performing loans and loan loss provision with a view to improving their financial performance level. Banks, in order to design an effective supervision system, need to establish a suitable business environment; operating under a sound credit granting process, maintaining an appropriate credit administration that involves monitoring, processing as well as enough controls over credit risk. Also, banks need to create a mechanism necessary for hedging against risks inherent in the financial market.

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