

Credit Risk Indicators and Performance of Deposit Money Banks in Nigeria

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Abstract: Utilizing the Asset management proposition of the CAMEL approach, the research examined the influence of Credit Risk management on performance of the Deposit Money Banks in Nigeria, utilizing secondary time series data over the period of 1998 to 2016. The study employed estimation techniques such as Unit root test, Autoregressive Distributive Lag, Bond Test and granger causality test. It was discovered that, management strategies via banks' ability to keep quality asset showed a positive and significant influence on return on equity of banking institutions followed by current value of loan to deposit ratio which showed a significant adverse/negative relationship with return on equity (ROE). Overall, a reasonable long run relationship is seen to exist between employed variables. Although, it was discovered that interest rate spread and liquidity ratios as credit management techniques failed the long run influence. It was recommended that; Banking institutions should uphold their disbursement of quality/performing assets via loans to credit worthy clients and Loan to deposit ratio should be reviewed in order not to negatively influence the ability of banks to make or sustain profit.

Keywords: Credit Risk, Quality Assets, Non-Performing Loan, Liquidity Ratio, loan to Deposit Ratio.

Note: This study encompasses the periods of financial liberalization in the economy, adoption of the Basel accords. The study evaluation period follows the adoption of Universal Banking in Nigeria, commercial and merchant banks.

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I. Introduction

Risk is the possibility that the actual return of an investment will differ from the expected return. Risk can also be defined as the realistic possibility of losing the principal invested and the amount of interests accrued on it either partially or completely. Credit risk is the risk that a borrower defaults and does not honor its obligation to service debt. It occurs when the borrower is unable to pay his debts as agreed or fails to make timely payment on his debt servicing. The default of a small number of customers may result in a very large loss for the bank (Boland, 2012). Credit risk has been identified by Basel Committee as a main source of risk in the early stage of Basel Accord. Effective management of credit risk is inseparably linked to the development of banking technology which enables high speed loan decision making and simultaneously reduce the cost of controlling credit risk.

The financial services provided by banks are essential to economic and financial development. Their role as financial intermediaries facilitates rapid economic growth. Financial stability is vital for any nation so therefore the financial institutions need to be properly managed. The velocity of loan creation in an economy significantly influences the productive activities in a nation (Taiwo *et al.*, 2017). The main motive of a bank is to redirect funds from the surplus sector to the deficit sector in a profitable and sustainable manner. Interest on loans and advances are the main sources of income for a commercial bank, by given out loans, banks are exposed to different forms of risks e.g. liquidity risk, credit risk, etc. (Kargi, 2011).

Our main focus is the credit risk a bank incurs by virtue of loan creation. The Basel Committee on Banking Supervision (BCBS) defined credit risk as the probability that a bank borrower will fail to meet its obligations in accordance with agreed terms or the possibility of losing the outstanding loan partially or totally due to credit events (Iwedi, & Onuegbu, (2014). Poor credit administration reduces bank profitability and leads to bank distress and/or failure (Osuka, & Amako, (2015). Institutions with deteriorating situations and declining CAMELS ratings are subject to ever increasing supervisory scrutiny. Failed institutions are eventually resolved via a formal resolution process designed to protect retail depositors. The components of a bank's condition that are assessed: (C)apital adequacy, (A)ssets, (M)anagement Capability, (E)arnings, (L)iquidity (also called asset liability management), and (S)ensitivity (sensitivity to market risk, especially interest rate risk). The aim of

credit risk management is to maximize a bank's risk-adjusted rate of return. This can be achieved by maintaining credit risk exposure within acceptable parameters. Efficient loan portfolio diversification can ensure that credit risk is minimized but it is imperative for banks to be wary of credit risk in administering each individual loan.

The far reaching consequences of poor credit management apart from decline in profit include loss of confidence in the bank's ability to fulfil its short term and long term obligations, lack of trust on the part of depositors and other customers alike and the concomitant reduction in the level of operations. Despite the importance of credit and liquidity risk management to bank survival, to the researcher's knowledge, only a handful of papers has so far evaluated the association between credit and liquidity risk management on a broad range and its different dimensions in the Nigerian banking industry.

In view of the above, this research is centered around the investigation of credit risk management and banks financial performance in Nigeria utilizing selected variables such as Loan Loss provision, Non-Performing Loans, Aggregate Bank Loans and Bank Lending Rate against a critical performance and profitability measures represented as Returns on Assets (ROA).

Bank failures in Nigeria and other emerging economies have been attributed to improper lending practices, lack of experience /managerial incompetence, organizational and informational systems to adequately assess credit risk in the falling economy (Kolapo, Ayeni and Oke, 2012). There is sufficient empirical evidence that poor performance as manifest in banks is indicated by low bank performance indicators including: high levels of credit risk, poor quality loans, limited and or inadequate capitalization, operational inefficiencies, higher incidences of non-performing loans, higher levels of liquidity risk, and so on. Although these are mentioned as constraints affecting banks' performance, they are based on a few studies and non-elaborate methods to generate sufficient and valid conclusions (Ogbulu and Eze, 2016). Therefore, given that lending is a core function of deposit money banks, what are those factors that can enhance the performance of the banks in Nigeria?

II. Literature Review

Theoretical Framework

Real Bill Doctrine/Commercial Loan Theory

This theory is geared to influence persuasively both the bank lending and the general economic activities. Strict adoption of this theory will reveal that it is expected to serve as a monetary supply to changes in aggregate economic activity. The popularity of this doctrine among Deposit-Money Banks (DMBs) in Nigeria is evident. Nigerian bankers believe that since their resources were repayable at short notice, such depositors' monies should be employed accordingly in short-term loans. Kargi, (2011) posited that the strong tie to this conception is rather orthodox if consideration is given to the fact that at the time of the supremacy of the theory, there were little or no secondary reserve assets, which could have served as a liquidity buffer for the bank. More so, this theory fails to consider the credit needs of Nigeria's developing economy. It has not encouraged banks to fund the purchases of plants, equipment, land, and home-ownership (Taiwo *et al.*, 2017). For a theory to maintain that all loans should be liquidated in the normal course of business shows its failure to recognize the relative stability of banks deposits. Whereas, demand deposits are on demand, all depositors are not likely to demand payment at the same time.

Shiftability Theory:

This is based on the proposition that banks liquidity is maintained if it holds assets that could be shifted or sold to other lenders or investors for cash. Also, these assets could be shifted to the Central Bank for cash without material loss in case of exigencies than relying on maturities to solve their liquidity problems (Ngwu, 2006 as cited in Ojong, Basse & Awo 2014). This theory assumes that assets need not be tied on only self-liquidating bills, but also held in other shiftable open-market assets, such as government securities (Ezirim: 1998). It must be noted that the shiftability theory did not replace the commercial loan theory or made it to be invalid. Instead, the shiftability theory took a more general view of the banking business by broadening the list of assets deemed legitimate for bank ownership. The shiftability theory does not say that commercial loan are inappropriate bank assets, it does say that commercial loans are not the only appropriate asset. The central thesis of the shiftability theory may be stated very simply.

2.2 CONCEPTUAL FRAMEWORK

In light of credit management, which is a subset of liability management, the acronym CAMELS comes to light and stand for the following factors that examiners use to rate bank institutions:

Capital Adequacy: Examiners assess institutions' capital adequacy through capital trend analysis. Examiners also check if institutions comply with regulations pertaining to risk-based net worth requirement. To get a high capital adequacy rating, institutions must also comply with interest and dividend rules and practices. Other

factors involved in rating and assessing an institution's capital adequacy are its growth plans, economic environment, ability to control risk, and loan and investment concentrations.

Asset Quality: Asset quality covers an institutional loans' quality which reflects the earnings of the institution. Assessing asset quality involves rating investment risk factors that the company may face and comparing them to the company's capital earnings. This shows the stability of the company when faced with particular risks. Examiners also check how companies are affected by the fair market value of investments when mirrored with the company's book value of investments. Lastly, asset quality is reflected by the efficiency of an institution's investment policies and practices.

Management: Management assessment determines whether an institution is able to properly react to financial stress. This component rating is reflected by the management's capability to point out, measure, look after and control risks of the institution's daily activities. It covers the management's ability to ensure the safe operation of the institution as they comply with the necessary and applicable internal and external regulations.

Earnings: An institution's ability to create appropriate returns to be able to expand, retain competitiveness, and add capital is a key factor in rating its continued viability. Examiners determine this by assessing the company's growth, stability, valuation allowances, net interest margin, net worth level and the quality of the company's existing assets.

Liquidity: To assess a company's liquidity, examiners look at interest rate risk sensitivity, availability of assets which can easily be converted to cash, dependence on short-term volatile financial resources and ALM technical competence.

Sensitivity: Sensitivity covers how particular risk exposures can affect institutions. Examiners assess an institution's sensitivity to market risk by monitoring the management of credit concentrations. In this way, examiners are able to see how lending to specific industries affects an institution. These loans include agricultural lending, medical lending, credit card lending and energy sector lending. Exposure to foreign exchange, commodities, equities and derivatives are also included in rating the sensitivity of a company to market risk.

Risk Management and Bank Performance

The efficiency of the banking system has been one of the major issues in the new monetary and financial environment. The efficiency and competitiveness of financial institutions cannot easily be measured, since their products and services are of an intangible nature. Many researchers have attempted to measure the productivity and efficiency of the banking industry using outputs, costs, efficiency and performance (Kosmidou, 2008).

2.3 Empirical Framework

Taiwo et al., (2017) evaluated the influence of credit risk management on the performance of Nigerian Deposit Money Banks (DMBs) and Bank lending growth over the period of 17 years (1998- 2014). Secondary data for empirical analysis was obtained from CBN Statistical bulletin 2014 and World Bank (WDI) 2015. The study employed multiple linear regression model to analyze the time series data. The result showed that sound credit management strategies can boost investors and savers confidence in banks and lead to a growth in funds for loans and advances which leads to increased bank profitability.

Ogbulu and Eze (2016) investigated the impact of credit risk management on the performance of deposit money banks in Nigeria using the ECM and Granger causality techniques in addition to the IRF and VDC methodology. Data for the study were sourced from the CBN Statistical Bulletin and the Annual Reports and Accounts of the NDIC for the period 1989 to 2013. Our findings demonstrated succinctly that the selected credit risk management indicators under study significantly impacted on the performance of deposit money banks measured as return on equity, return on total assets, and return on shareholders' fund respectively.

Iwedi, & Onuegbu, (2014) posited that credit risk management plays a key role in bank's financial performance. Owojori, Akintoye & Adidu, (2011) observed if a link existed between capital regulation and performance of Nigerian banks. Their findings revealed that consolidation of banks has increased the potential of banks to compete effectively at all levels.

Kargi (2011) studied some Nigerian banks between 2004 and 2008 and found that there exists a significant relationship between banks performance and credit risk management. Shafiq & Nasr, (2010) found that the credit risk management had a significant influence on bank profitability.

Osuka & Amako, (2015) found that the indicator of Non-performing loans had negative impact on banks profitability as measured by return on equity (ROE) and return on assets (ROA). Alshatti, (2015) revealed that the variables of credit risk management influenced banks' profitability.

Osuka & Amako, (2015) using time series data from 2001 – 2011 appraised the impact of the credit risk management in bank's financial performance in Nepal. The result of the study indicated that credit risk management is an important predictor of banks' profitability and financial performance.

Iwedi, & Onuegbu, (2014) examined the role of capital requirement on bank competition and stability in Kenya using data estimation on time series data between 2000 and 2011. The result of study indicated that regulatory efficiency improves competition in the banking sector.

Boland (2012) in their work examined bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007 using regression analysis. The result of their study showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets (ROA) while the capital adequacy ratio has a positive impact on the net interest margin.

Kolapo, Ayeni and Oke (2012) showed that the effect of credit risk on bank performance measured by ROA was cross-sectional invariant, though the degree to which individual banks were affected was not captured by the method of analysis employed in the study.

Moti, Masinde, & Mugenda, (2012) investigated the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Co-operation Council (GCC) countries over the period 1998-2008. Using regression analysis, he observed that bad debts or credit risks, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

Chen and Pan (2012) in their work examined the credit risk efficiency of 34 Taiwanese Commercial banks over the period 2005- 2008. Their study used financial ratios to assess the credit risk and was analyzed using Data Envelopment Analysis (DEA). The result of their study indicated that only one bank is efficient in all types of efficiencies over the evaluated periods.

Kargi, (2011) concluded that liquidity and bank size affected strongly on effectiveness of credit risk management. Boland (2012) discovered that effective risk management was critical to any bank for achieving financial soundness. Shafiq & Nasr, (2010) concluded that bank's financial performance had been affected by sound credit risk management and capital adequacy.

Afriyie & Akotey, (2011) investigated the effect of credit risk management techniques on the banks' performance of unsecured loans. They concluded that financial risk in a banking organization might result in imposition of constraints on bank's ability to meet its business objectives.

Kargi, (2011) used Return on Equity as a measure of bank's performance and a ratio of non-performing loans to total asset as proxy for credit risk management. They found that Non-performing loans (NPL) had a larger effect on profitability as measured by (ROE) than capital adequacy ratio (CAR) and the effect of credit risk management on profitability varied among Ghanaian banks included in their study.

Kithinji (2010) examined the impact of credit risk management on the profitability of commercial banks in Kenya between 2004 and 2008. Using regression analysis, he found that the larger part of the banks' profits was influenced by other variables other than credit and nonperforming loans. Das, & Ghosh, (2007) revealed that credit risk management has a strong bearing on bank profitability in Kenya.

Shafiq & Nasr, (2010) examined the key determinants of credit risk of commercial banks on emerging economies banking systems compared with the developed economies. They found that regulation is important for banking systems that offer multi-products and services, management quality is critical in the cases of loan-dominant banks in emerging economies. Boland (2012) studied the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989-2005 and found that bank capitalization and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability.

Hosna & Manzura, (2009) investigated the effects of credit risk and other risk components on the banks' financial performance. They found a strong relationship between risk components and the banks' financial performance. Harvey & Merkowsky (2008) examined the relationship between credit risk and banks' profitability. They found a linear relationship between credit risk and bank profitability.

Harvey & Merkowsky (2008) used descriptive, correlation and regression techniques to study whether credit risk affects banks' performance in Nigeria from 2004 – 2008. They also found out that credit risk management has a significant impact on profitability of Nigerian banks.

III. Materials and Methods

For purpose of clarity, this section is further divided into subsections as presented below: While employing the expo-facto research design, the study employed secondary data culled from the central bank of Nigeria statistical bulletin over the period of 1998 to 2016. Employed data are presented in the following section.

Data and Employed Variables Description:

Table 1: Return on Equity (ROE), Quality asset ratio (QAR), Interest rate spread (IRS), Liquidity Ratio (LQR) and Loan to Deposit Ratio (LDR) of banks in Nigeria 1998 to 2016.

Year	ROE	QAR	IRS	LQR	LDR
1998	86.08	26.78	15.85	46.80	74.40
1999	80.59	25.65	21.86	61.00	54.60
2000	99.45	30.00	16.26	64.10	51.00
2001	114.29	39.62	15.85	52.90	65.63
2002	41.63	15.65	26.04	52.45	62.78
2003	29.11	13.44	18.77	50.90	61.85
2004	27.23	4.40	16.63	50.48	68.63
2005	4.81	2.17	15.66	50.18	70.80
2006	17.36	6.39	15.56	55.70	63.60
2007	36.83	1.07	14.82	48.75	70.78
2008	34.11	7.27	15.86	44.25	80.93
2009	-64.72	2.40	19.95	30.70	85.66
2010	16.00	3.21	20.30	30.43	74.20
2011	-0.28	4.52	21.01	42.00	44.77
2012	22.20	5.03	22.09	49.72	42.31
2013	23.21	4.50	22.52	63.21	37.97
2014	13.76	6.32	22.36	38.28	61.89
2015	21.70	15.24	23.13	39.65	68.56
2016	11.80	19.60	23.54	41.24	75.93

Source: Central Bank of Nigeria Statistical Bulletin (2016).

Operationalized Variables: The Return on Equity is expected to be predicted by the following variables; **Quality Asset Ratio:** This captures the ratio of performing assets to total assets over the study period. **Interest rate spread** which entails the difference between the cost of funds and cost of deposit measures the cost benefit analysis associated with credit operations. **Liquidity ratio** measures the nature of risk associated with the rate of having a certain amount of liquidity which is also an inverse form of credit risk management risk. **Loan to deposit ratio** shows the rate of aggregate loan to total deposit thereby gauging the nature of risk firms are exposed to.

Model specification

In light of taiwo *et al.*, (2017), the study employs the following model;

$$ROE = f(QAR, IRS, LQR, LDR) \tag{1}$$

Transforming the above to econometric model would include the constant and error term as presented below:

$$ROE_t = \beta_0 + \beta_1 QAR_t + \beta_2 IRS_t + \beta_3 LQR_t + \beta_4 LDR_t + \mu_t \tag{2}$$

Due to the nature of employed series, an autoregressive model will thus be appropriate as presented below as follows:

$$ROE_t = \beta_0 + \alpha ROE_{t-1} + \beta_1 QAR_t + \beta_2 IRS_t + \beta_3 LQR_t + \beta_4 LDR_t + \mu_t \tag{3}$$

Where:

- ROE = Return on Equity
- QAR = Quality asset ratio
- IRS = Interest rate spread
- LQR = Liquidity Ratio
- LDR = Loan to Deposit Ratio
- β_0 = Constant/Intercept
- $\beta_1 - \beta_4$ = Coefficient/Trend
- μ_t = Error Term

apriori expectation: $B_1 B_2 B_4 > 0$ while $B_3 < 0$

Where:

- B_1 = Quality Asset Ratio
- B_2 = interest rate spread and
- B_3 = Liquidity ratio
- B_4 Loan to Deposit ratio

Specification of Analytical Tools and Tests:

The core objective of this study is to evaluate on comparative basis, the nature of interrelationships which prevail between Credit Risk Management and Firm Performance. For clarity, this subsection is considered as follows;

Stationarity Tests

In order to minimize the incidence of unit roots which leads to spurious estimates, it is usually important to evaluate the stationarity properties or otherwise, of given time-series data. To this effect, the Augmented Dickey Fuller (ADF) test is employed. The decision rule is to reject the null hypothesis of significant existence of a unit root if the absolute value of the ADF test statistics is higher than the absolute values of all the McKinnon critical values at 1%, 5% and 10% levels respectively.

Autoregressive Distributive lag Test (ARDL)/Bond Test

In statistics and econometrics, a distributed lag model is a model for time series data in which a regression equation is used to predict current values of a dependent variable based on both the current values of an explanatory variable and the lagged (past period) values of this explanatory variable.

Granger Causality Test:

The standard Pair-wise Granger Causality test in accordance with Maddala (2007), seeks to examine the extent to which variations in a given set of paired variables tend to provide support for growths in each other and the extent, to which inclusion of lagged values of each of them will improve the explanation in a given regression framework as expressed in equation (3) and (4) below:

IV. Presentation of Results

The presentation and evaluation of the results of this study are presented below under the following subheads:

4.1 Presentation of Stationarity Test Results:

Accordingly, the stationarity test results for the variables of study are presented in table1 below;

Table 2. Results of Stationarity Test Output for Study Variables:

VARIABLES	ADF CRITICAL VALUE	McKinnon's Critical values			Level of Integration	Probability
		1%	5%	10%		
ROE	-5.965489	-3.886751	-3.052169	-2.666593	I(1))	0.0002
QAR	-4.339567	-3.920350	-3.065585	-2.673459	I(1))	0.0007
IRS	-6.040439	-3.886751	-3.052169	-2.666593	I(1))	0.0002
LQR	-4.473052	-3.886751	-3.052169	-2.666593	I(1))	0.0032
LDR	-3.911866	-3.886751	-3.052169	-2.666593	I(1))	0.0053

Source: Extracts from E-views 10.

The results presented in table I above show that all the variables are stationary at first difference. They are therefore, integrated of order I(1). Accordingly, they could be employed for subsequent Johansen's Co-integration analysis.

Autoregressive Distributive lag Test (ARDL)/Bond Cointegration

Table 3: Autoregressive Distributive lag Test output

Dependent Variable: ROE
 Method: ARDL
 Date: 07/28/18 Time: 10:43
 Sample (adjusted): 1999 2016
 Included observations: 18 after adjustments
 Maximum dependent lags: 1 (Automatic selection)
 Model selection method: Akaike info criterion (AIC)
 Dynamic regressors (1 lag, automatic): QAR IRS LQR LDR
 Fixed regressors: C
 Number of models evaluated: 16
 Selected Model: ARDL(1, 1, 1, 0, 1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
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ROE(-1)	-0.507238	0.278118	-1.823823	0.1015
QAR	2.398600	0.759286	3.159022	0.0116
QAR(-1)	1.629104	1.078861	1.510023	0.1653
IRS	-2.924452	2.114934	-1.382763	0.2001
IRS(-1)	-2.426380	1.997537	-1.214686	0.2554
LQR	0.858616	1.001530	0.857305	0.4135
LDR	-0.441382	0.281074	-2.148067	0.0331
LDR(-1)	-0.708556	0.509222	-1.391448	0.1975
C	134.7919	122.8275	1.097408	0.3010

R-squared	0.867555	Mean dependent var	29.39333
Adjusted R-squared	0.749826	S.D. dependent var	39.36105
S.E. of regression	19.68738	Akaike info criterion	9.104685
Sum squared resid	3488.335	Schwarz criterion	9.549871
Log likelihood	-72.94217	Hannan-Quinn criter.	9.166070
F-statistic	7.369084	Durbin-Watson stat	2.618475
Prob(F-statistic)	0.003553		

*Note: p-values and any subsequent tests do not account for model selection.

Source: Extracts from E-views 10.

The study discovers evidence of significant long run relationship based on the universal statistics in which; employed predictor variables jointly account for 86.76 percent of variation in the return on equity of employed banks in Nigeria. Also, the f-statistics shows a viable model. The study discovers that quality asset shows a positive and significant influence on return on equity of banking institutions followed by current value of loan to deposit ratio which shows a significant adverse/negative relationship with return on equity (ROE). Overall, a reasonable long run relationship is seen to exist between employed variables. Although, it can be seen that interest rate spread and liquidity ratios as credit management techniques failed the long run influence.

Bond Test

The study proceeds to carry out the bond test of the above ARDL model below:

Table 4: Bond Test output

ARDL Bounds Test
 Date: 07/28/18 Time: 10:44
 Sample: 1999 2016
 Included observations: 18
 Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	5.544693	4

Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Test Equation:
 Dependent Variable: D(ROE)
 Method: Least Squares
 Date: 07/28/18 Time: 10:44
 Sample: 1999 2016
 Included observations: 18

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(QAR)	2.390373	0.842361	2.837706	0.0195
D(IRS)	-3.709472	2.691320	-1.378310	0.2014
D(LDR)	-0.925490	0.589093	-1.571043	0.1506
C	204.3592	155.8349	1.311383	0.2222
QAR(-1)	4.163408	1.002380	4.153521	0.0025
IRS(-1)	-6.237653	3.002364	-2.077580	0.0475
LQR(-1)	0.219363	1.534845	0.142922	0.8895
LDR(-1)	-1.535678	0.741990	-2.069674	0.0484
ROE(-1)	-1.468689	0.303966	-4.831748	0.0009
CointEq(-1)	-0.257853	0.071402	-3.611430	0.0023
R-squared	0.843730	Mean dependent var		-4.126667
Adjusted R-squared	0.704824	S.D. dependent var		37.64446
S.E. of regression	20.45228	Akaike info criterion		9.180918
Sum squared resid	3764.661	Schwarz criterion		9.626104
Log likelihood	-73.62827	Hannan-Quinn criter.		9.242304
F-statistic	6.074091	Durbin-Watson stat		2.677965
Prob(F-statistic)	0.007004			

Source: Extracts from E-views 10.

In light of existence of long run relationship as seen by the Bond test above, it can be further reckons that the disequilibrium between the long and short run ARDL model can be adjusted backward by approximately -0.257856. This shows that there would be a 25.79 percent adjustment back to equilibrium in the model. In light of the long run coefficients. Going by the significant f-statistics value of 5.544693, the study discovers that; performance of firms is predicated on its past value. This is seen in light of the negative ROE (-1) which shows that, past performance has a poor influence on present performance of financial institution. In the long run, quality asset sustained its positive and significant influence on bank returns coupled with a significant influence of past values of quality asset while loan to deposit ratio shows a negative but significant influence on the financial performance of existent banks in Nigeria. Interest rate spread and liquidity ratios show no profitability motive in light of their significance.

4.1.4 Presentation of Granger causality Test Results:

The results of Granger Causality test for the employed data are presented in table 4 below:

Table 5: Pairwise Granger Causality Test Result:

Pairwise Granger Causality Tests
 Date: 07/28/18 Time: 10:45
 Sample: 1998 2016
 Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
QAR does not Granger Cause ROE	17	2.84775	0.0425
ROE does not Granger Cause QAR		0.06537	0.9370
IRS does not Granger Cause ROE	17	0.30387	0.7435
ROE does not Granger Cause IRS		0.26440	0.7720
LQR does not Granger Cause ROE	17	0.62864	0.5500
ROE does not Granger Cause LQR		0.73462	0.5001
LDR does not Granger Cause ROE	17	1.70932	0.2222
ROE does not Granger Cause LDR		0.46937	0.6364
IRS does not Granger Cause QAR	17	0.50191	0.6175
QAR does not Granger Cause IRS		4.21818	0.0410
LQR does not Granger Cause QAR	17	0.12478	0.8838
QAR does not Granger Cause LQR		0.88391	0.4384

LDR does not Granger Cause QAR	17	0.32354	0.7297
QAR does not Granger Cause LDR		0.00273	0.9973
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LQR does not Granger Cause IRS	17	1.16155	0.3458
IRS does not Granger Cause LQR		0.02309	0.9772
<hr/>			
LDR does not Granger Cause IRS	17	1.08296	0.3695
IRS does not Granger Cause LDR		0.53958	0.5965
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LDR does not Granger Cause LQR	17	0.65242	0.5383
LQR does not Granger Cause LDR		2.53814	0.1204

Source: Extracts from E-views 10.

Unidirectional Causal relationship is seen to spill from quality asset to return on equity. This shows that, the most viable means of credit risk management is predicated on the management of quality assets in the form of performing loans. Absence of bidirectional causality amongst employed predictor variable shows the absence of multicollinearity in the model.

Summary of findings: The findings of this study shows a great influence of quality loans on the financial performance of banks and it can be seen that the loan to deposit ratio had a counter effect in bolstering performance of banks in Nigeria.

V. Discussion, Conclusions And Policy Recommendation:

The research tested for the influence of Credit Risk management on performance of the Deposit Money Banks in Nigeria within the period of 1998 to 2016 using time series data set, it was discovered that, overall, the model was discovered to be substantial based on the F-statistics, denoting that the model is statistically substantial, all employed variable were found to have little to no influence in the short term and long term except for quality assets ratio and the loan to deposit ratio. This goes a long way to show that.

- i. The banking system has been curbing its credit risk to a reasonable extent via the disbursement of quality assets.
- ii. Loan to Deposit ratio is limiting the ability of banking institutions from achieving their profitability objectives.

VI. Recommendation

In light of this, it is recommended that;

- Banking institutions should uphold their disbursement of quality/performing assets via loans to credit worthy clients.
- Loan to deposit ratio should be reviewed in order not to negatively influence the ability of banks to make or sustain profit.
- There is need to review techniques associated with interest rate spread and liquidity ratios.

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Appendix

Year	Return on Equity	Performing Asset	Total Asset	Quality asset ratio	Savings Rate	Maximum Lending Rate	Interest rate spread	Liquidity Ratio	Loan to Deposit Ratio
1998	86.08	456.98	1706.16	26.78	5.49	21.34	15.85	46.80	74.40
1999	80.59	532.29	2075.39	25.65	5.33	27.19	21.86	61.00	54.60
2000	99.45	513.00	1710.05	30.00	5.29	21.55	16.26	64.10	51.00
2001	114.29	738.59	1864.40	39.62	5.49	21.34	15.85	52.90	65.63
2002	41.63	532.45	3402.27	15.65	4.15	30.19	26.04	52.45	62.78
2003	29.11	592.23	4406.73	13.44	4.11	22.88	18.77	50.90	61.85
2004	27.23	441.59	10034.51	4.40	4.19	20.82	16.63	50.48	68.63
2005	4.81	188.30	8688.99	2.17	3.83	19.49	15.66	50.18	70.80
2006	17.36	652.49	10203.96	6.39	3.14	18.70	15.56	55.70	63.60
2007	36.83	97.04	9057.81	1.07	3.55	18.36	14.82	48.75	70.78
2008	34.11	636.97	8767.69	7.27	2.84	18.70	15.86	44.25	80.93
2009	-64.72	401.50	16750.71	2.40	2.68	22.62	19.95	30.70	85.66
2010	16.00	664.76	20680.45	3.21	2.21	22.51	20.30	30.43	74.20
2011	-0.28	680.60	15062.62	4.52	1.41	22.42	21.01	42.00	44.77
2012	22.20	733.35	14583.36	5.03	1.70	23.79	22.09	49.72	42.31
2013	23.21	678.13	15062.62	4.50	2.17	24.69	22.52	63.21	37.97
2014	13.76	922.38	14583.36	6.32	3.38	25.74	22.36	38.28	61.89
2015	21.70	2513.98	16492.27	15.24	3.58	26.71	23.13	39.65	68.56
2016	11.80	4743.34	24195.57	19.60	3.75	27.29	23.54	41.24	75.93

Source: Central Bank of Nigeria Statistical Bulletin (2016).

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