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An Empirical Investigation of the Impact of Credit Risk Management on Commercial Banks Financial Performance in Nigeria (Generalized Method of Moments Approach)

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Abstract

This study seeks to empirically investigate the impact of credit risk management on commercial banks' performance in Nigeria from 2013 to 2017 on a panel data analysis. Fifteen commercial banks' data listed on the floor of the Nigeria stock exchange were extracted to analyse the study. The data were subjected to jarque-bera test of normality to remove spurious regression. The key objective of the study is to find out the impacts of nonperforming loans and performing loans on capital adequacy ratio. To achieve the objectives, a linear model was formulated and a Generalized Method of Moments (GMM) was adopted as the method of estimating the parameters. From the GMM regression results, the study found out that there is a negative relationship between non-performing loans and capital adequacy ratio in the Nigeria banking sector. The T-calculated value for NPL is -3.599695 which is compared with 5% statistical value (-3.599695<0.05). We accept the null hypothesis that non-performing loans do not affect capital adequacy ratio in the Nigeria banking sector. The coefficient of determination of the GMM shows that 55.35% of the independent variables are captured by the dependent variable, making the model a good fit. The study therefore recommends an appropriate value at risk model for credit risk management in the Nigeria banking sector.

Keywords: Credit risk, banks, non-performing loans, regression, capital adequacy ratio

1.0 Introduction

The issue of credit risk management has a long history in the Nigeria banking system. It is as a result of this long history that the federal government of Nigeria tries to redesign the credit risk management system from time to time. In September 2018, the federal government of Nigeria issued additional regulatory guidelines for the operation of the redesigned Credit Risk Management System (CRMS). However, it is noted that the importance of banks in economic growth cannot be over-emphasized as they are the primary source of credit to individuals

and organizations in any economy. While research into the role and performance of banks has been ongoing for the last twenty years, it has often been limited by availability of requisite data (Syed 2017). To ensure their concern, banks have continually developed policies that guide their activities. Regulatory agencies also exist to create boundaries for the operation of the banks and ensure a stable and sustainable banking industry. However, experience has shown that despite periods of robustness, the banking system remains vulnerable to shocks, a major source of which is credit risk. Commercial banks have the primary function of carrying out financial intermediation, i.e., they accept deposits from customers with surplus funds and loan out to customers with a funding gap. The cost of receiving the deposits from customers is termed interest expense, while the return from loaning the funds out to other customers is termed interest income. Typically, interest income is higher than interest expense; the difference is the spread or profit which accrues as interest income to the bank. In addition to the spread, financial institutions also invest funds at their disposal with the ultimate aim of making a return on their investments.

The financial industry today is globally characterized by stiff and intense competition which threatens the very survival of the institutions themselves. As the stronger banks try to consolidate their hold on the industry, the smaller players develop strategies to compete. This leads to the creation of different banking products, varying from different types of accounts with varying attached benefits to different offers for loans and mortgages, thus increasing the pressure on the banks to extend credit and maximize profit without creating appropriate models to absorb credit shock. In the year 2018, one of the famous Nigeria banks was taken over and one of the reasons for this take-over was bad credit risk management. In as much as credit management is important, the problem is the inappropriate modelling of credit risk management in accordance with the Basel Accord. Therefore the study objective is to find out the impact of non-performing loans and performing loans on profitability from 2013-2017 on a panel data analysis with 15 listed commercial banks in Nigeria.

2.0 Literature

Lending operations are core banking activities and the most profitable assets of credit institutions. Credit risk is defined as the risk of a credit institution suffering losses due to default, late or incomplete execution of the debtor's financial obligations is the credit organization in accordance with the terms of the contract.

Risk is determined by factor not belonging to the bank such as general unemployment levels, changing socio-economic conditions, and debtors' attitudes

and political. The role of bank remains central in financing economic activity and its effectiveness could exert positive impact on the overall economy, as a sound and profitable banking sector is better able to withstand negative shocks and contribute to the stability of the financial system (Achou & Tenguh, 2008). The determinants of bank performance have attracted the interest of academic research as well as of bank management. Studies dealing with internal determinants employ variables such as size, capital, credit risk management and expenses management. The need for risk management in the banking sector is inherent in the nature of the banking business. Poor asset quality and low levels of liquidity are the two major causes of bank failures and represented as the key risk sources in terms of credit and liquidity risk and attracted great attention from researchers to examine the impact on bank profitability.

2.1 Concept of Credit Risk in Banks

A bank exists not only to accept deposits but also to grant credit facilities, and is therefore inevitably exposed to credit risk. Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risks (Ali, 2015).

According to Badar and Javid (2013), credit risk is the degree of fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. Credit risk management maximizes banks risk adjusted rate of return by maintaining credit risk exposure within acceptable limit in order to provide framework for understanding the impact of credit risk management on banks profitability (Ayele, 2012). A sound credit risk management framework is crucial for banks so as to enhance profitability and guarantee survival. The main source of credit risk include, limited institutional capacity, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Hosna, 2009). An increase in bank credit risk gradually leads to liquidity and solvency problems. Credit risk may increase if the bank lends to borrowers it does not have adequate knowledge about.

Credit risk, according to the Basel Committee of Banking Supervision BCBS (2001) and Ayele (2012), is the possibility of losing the outstanding loan partially or totally, due to credit events (default risk). Credit events usually include events such as bankruptcy, failure to pay a, repudiation / moratorium or credit rating change and restructure. Basel Committee on Banking Supervision BCBS defined

credit risk as the potential that a bank borrower or counterparty will fail to meet its obligations in accordance with agreed terms (Ernest and Fredrick 2017). Joseph et al (2012) observe that credit risk as the risk that an asset or a loan becomes irrecoverable in the case of outright default, or the risk of delay in the servicing of the loan. In either case, the present value of the asset declines, thereby undermining the solvency of a bank. Credit risk is critical in the default of a small number of important customers can generate large losses, which can lead to insolvency (Masun & Lind 2002). From the year 2004 to 2018, the banking industry has proven to be no doubt a regulated sector as a result of the riskiness of its operation. This can be seen from the prevention of the ruin of Skye bank in 2018. Consequently, risk management in banks is fast becoming a discipline that every participants and player in the industry need to align with. It is obvious that risk management involves risk identification, risk measurement, risk monitoring and risk control. This however, had helped the regulators of the Nigeria banking sector to effectively manage the transmission of Skye bank to Polaris Bank (CBN, 2018).

Credit policies provide the framework for the entire credit management process. They set objective standards and parameters to guide officers who grant loan and manage the loan portfolio. They also provide the board of directors, regulators, internal and external auditors with a basis for evaluating a bank's credit management performance. When credit policies are carefully formulated, administered from the top, and clearly understood by all organizations levels, they enable bank managements to maintain proper credit standards, avoid excessive risks, and evaluate business opportunities properly. Bank supervisors' consider sound written loan policies to be fundamental to good credit risk management. In developing countries like Nigeria, credit policy often emanate from the monetary authorities. The basic reason for credit policy is to ensure operation consistency and adherence to uniform and sound practices. Policy is the general rule designed to guide each decision. The credit creation role so peculiar to commercial bank is central on banking operations. The bankers' job is to decide who can be trusted with depositors' money. This banking function is critical. A bank must decide which loans it will or will not make, to when it will lend, and under what circumstances it will lend. All of these critical decisions call for policy objectives to maintain a desirable relationship among loans. Deposits and other liabilities, credit policy objectives should encompass several settlements; the selection risk, loan portfolio, etc.

Flamini et al (2009) assert that credit risk arises from non-performance by a borrower. Credit risk arises whenever a lender is exposed to loss from a borrower,

counterparty, or an obligator who fails to honour their debt obligation as they have contracted (Kargi, 2011). According to Colquitt (2007), this loss may derive from deterioration in the counterparty's credit quality, which consequently leads to a loss to the value of the debt. Kolapo et al. (2012), the borrower defaults when he is unwillingly to fulfil his obligations.

Financial institutions have had challenges in managing credit risk because of its magnitude in the effect of bank operations. Nwaz et al (2012) pointed out that credit risk is critical since the default of a small number of important customers can generate large losses, which can lead to insolvency. The goal of credit risk management is to achieve the maximum risk adjusted return by identifying credit risk inherent in its individual bank transactions as well as portfolios and controlling the risk to acceptable limits. Basel (2001) points out that the effective management of credit risk is a critical component of a comprehensive approach to risk management and essential to the long-term success of any banking organization.

The deregulation of the financial system in Nigeria embarked upon from 1986 allowed the influx of banks into the banking industry. As a result of alternative interest rate on deposits and loans, credits were given out indiscriminately without proper credit appraisal (Onaolapo & Soyebo, 2012). The resultant effects were that many of these loans turn out to be bad. It is therefore not surprising to find banks to have non-performing loans that exceed 50 per cent of the bank's loan portfolio. The increased number of banks over-stretched their existing human resources capacity which resulted into many problems such as poor credit appraisal system, financial crimes, accumulation of poor asset quality among others (Sanusi, 2002). The consequence was increase in the number of distressed banks.

Studies on the relationship between risk management and financial performance of banks mostly have been conceptual in nature, often drawing the theoretical link between good risk management practices and improved bank performance. Adeusi and Akeke, (2013) in their study which focused on the association of risk management practices and bank financial performance in Nigeria, using a panel of secondary data for 10 banks and for four years they reported an inverse relationship between financial performance of banks and doubtful loans, capital asset ratio was found to be positive and significant. Similarly it suggests that the higher the managed funds by banks, the higher the performance. The study concludes a significant relationship between banks performance and risk

management. Hence, the need for banks to practice prudent risks management in order to protect the interests of investors.

Tabari et al (2013) state the importance of good risk management practices to maximize firms' value. In particular, they suggest that effective enterprise risk management (ERM) has a long-run competitive advantage to the firm (or banks) compared to those that manage and monitor risks individually. It is, therefore suggested that companies should manage risks strategically by viewing all the risks together within a coordinated manner. In relation to this, Stulz (1996) associates good risk management practices with the elimination of costly lower-tail outcomes by proposing "full-cover" risk management as compared to "selective" risk management. The study suggests that prudent risks management is important in reducing the bankruptcy costs. Ahmed, Takeda and Shawn (1998) in their study found that loan loss provision has a significant positive influence on non-performing loans. Therefore, an increase in loan loss provision indicates an increase in credit risk and deterioration in the quality of loans consequently affecting bank performance adversely.

Poudel and Sharma (2012) in an attempt to examine the impact of credit risk management on the profitability of commercial banks in Kenya for the period 2004 - 2008 showed that the majority of commercial banks are not affected by the amount of credit risks. Richard et al (2008) examined the level of influence that credit risk management has on profitability in four Swedish commercial banks. It was revealed in the analysis that credit risk management had an impact on profitability in all the sampled banks although NPL had more significant impact than CAR. Njanike (2009) explored the association between credit risk and macroeconomic development, employing a broad set of data containing in-depth information for over 3000 firms. It was revealed that firms had the tendency of taking excessive risks in periods of economic growth. It was also observed that default probabilities are influenced by several firm-specific characteristics, so even as financial conditions are significant in explaining default probabilities, in assessing default probabilities macroeconomic situations should be considered.

Bolahen et al (2012) examined bank performance in the presence of risk for the Costa-Rican banking industry during 1998-2007. The results showed that performance improvements followed regulatory changes and that risk explains difference in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the interest margin. They stressed that banks with larger loan portfolios appear to require a higher net interest margin to compensate for higher risk of default. They

add that variations in credit risk would lead to variations in the health of banks' loan portfolio which in turn affect bank performance.

Likewise, Kargi (2011) assessed 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 Cooperation Council (GCC) countries over the period 1998-2008. Using the fixed effect regression analysis, results showed that credit risk, 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.

Gerhead (2011) highlighted that available statistics from liquidated banks clearly showed that inability to collect loans and advances extended to customers and directors or companies related to directors/managers was a major contributor to the distress of the liquidated banks. Kargi (2011) evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress. Naceur and Kandil (2006) examined the impact of capital requirement on bank's performance in Egypt using generalized method of moment (GMM). Their findings reemphasized the importance of capital regulation to banks' performance.

3.0 Methodology

The model adopted for this study "the impact of credit risk management on commercial banks in Nigeria" measured profitability with a function of capital adequacy ratio. The basis and justification of the model and method is distilled from the literatures. Researchers such as Ali (2015), Ernest and Fredrick (2017), Syed (2017) and Naceur and Kandil (2006) used a regression model. On the basis of this empirical literature the model was formulated thus:

CAR =f (NPL, PL, NII)…….…....Eq(1)

Rewriting the Model in Linear form

$$CAR_t = \beta_0 + \beta_1 NPL_t + \beta_2 PL_t + \beta_3 NII_t + \mu_t$$

Where:
CAR = Capital adequacy ratio as proxy for profitability

NPL = Non Performing Loan

PL = Performing Loan

NII = Net Interest Income
β_0= Slope of the regression
$\beta_{1,2,3}$= Coefficient of the variables

U_t = Error term
CAR $= \frac{total\ deposits}{bank\ size}$, $f^i(CAR) > 0$
NPL= $\frac{default\ loans}{total\ loans}$, $f^i(NPL) > 0$
PL= $\frac{performing\ loans}{total\ loans}$, $f^i(PL) > 0$
NII= $\frac{net\ interest}{average\ earning}$, $f^i(NII) > 0$

3.1 Jarque-Bera (JB) Test for Normality

Jarque–Bera test is a goodness-of-fit test of whether sample data have the skewness and kurtosis matching a normal distribution.

The Jarque-Bera test statistic is defined as:

$$\frac{N}{6}\left(S^2 + \frac{(K-3)^2}{4}\right)$$

with S, K, and N denoting the sample skewness, the sample kurtosis, and the sample size, respectively.

Table 1: Results of Jarque-Bera Test of Normality

Skewness	0.5423
Kurtosis	3.2345
N	75
JB	3.8479
Chi-square (0.05,2)	5.99

JB<Chi-square

Since 3.85<5.99 we conclude that the data follows a normal distribution.

3.2 Generalized Method of Moments Test

Table 2

Dependent Variable: CAR
Method: Generalized Method of Moments
Date: 11/21/18 Time: 12:22
Sample: 2013 2017
Included observations: 75
Linear estimation with 1 weight update
Estimation weighting matrix: HAC (Bartlett kernel, Newey-West fixed bandwidth = 4.0000)
Standard errors & covariance computed using estimation weighting matrix
Instrument specification: NPL, PL, NII
Constant added to instrument list

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	28.64845	4.913237	5.830870	0.0000
NPL	-13.08219	3.634248	-3.599695	0.0000
PL	0.574966	0.730954	0.786597	0.0000
NII	-367.2605	87.20668	-4.211380	0.0001

R-squared	0.553507	Mean dependent var	35.44462
Adjusted R-squared	0.531548	S.D. dependent var	14.72279
S.E. of regression	10.07680	Sum squared resid	6194.057
Durbin-Watson stat	1.143535	J-statistic	0.000000
Instrument rank	4		

Source: Eview7, 2018

3.3 Discussions and Interpretation of Statistical Significance of the Variables in the Model

Table 1.1 shows the probability of each of the variables used in the model. The probability value shows if the variables are statistically significant or not. It is noted in statistics that a probability value of 0.0000 are statistically significant. The non-performing loan (NPL) shows a probability of 0.0000 indicating that there is a statistical significant probability relationship between the dependent variable CAR and the independent variable NPL.

Non-performing loan (NPL) from the above regression result show a negative relationship with bank profitability proxy for capital adequacy (CAR) of

13.08219. This means that one percent increase in NPL will lead to a fall in CAR. Kuwara and Garba (2014) on their study titled 'the effect of credit risk management on bank's profitability' stated that NPL is a strong indicator of bank credit risk management because any up and down movement of NPL reflect on bank's profitability. Their study shows that the impact of NPL on commercial banks is dependent on some risky variables. Li and Zou (2014) stated that the purpose for calculating NPL is to checkmate the impact of profitability and stability of the bank. Having noted the significance of NPL in credit risk management, some studies such as the work of Idowu and Awoyemi (2014) justify that NPL as a significant negative relationship with profitability. To generalize this relationship, this study therefore shows empirical that the relationship between NPL and CAR is negative.

Performing Loan (PL) shows positive relations with CAR of 0.574966. This means that one percent increase in PL will lead to a corresponding increase in CAR. In this context where there is a positive relationship between PL and CAR, there is certainty that as banks regularly monitor performing loans in Nigeria, the rate of credit risk will fall thereby affecting bank profitability in the long run. The panel functional relationship between PL and CAR is 0.574966. This indicates a positive relationship. From the economic criterion stated in this study, it is expected that PL should be positive and thus bring about a positive effect on CAR. Therefore, the result of PL corroborate with the a priori expectation.

In the result, the coefficient of determination is high. It shows that about 55.35 percent of the total variations in CAR are explained by all the independent variables in the GMM regression result. This however, indicates that the dependent variable and the independent variables are a good fit. The Durbin Watson statistics show 1.1435, indicating the presence of a positive serial correlation.

3.4 Test of Hypotheses

Non-performing loan does not significantly affect capital adequacy ratio.

The variable to be tested here is NPL against CAR. The reason for the test is to validate the research question and the objective that the researchers had in mind and if the findings corroborate with other empirical literatures. The P-value or Sig value is compared with that of 5% confidence interval. From the panel data result, the t-calculated for NPL is -3.599695 which is the same as the P-value, and is therefore compared with 0.05 i.e. -3.599695 <0.05 we accept the null hypothesis that non-performing loan (NPL) does not affect bank profitability in Nigeria. Therefore, one of the findings of this study is that non-performing loan in credit

risk management does not affect bank profitability. This finding corroborate other studies in this field of research such as the work of Li and Zou (2014) and Kuwura and Garba (2014).

There is no significant relationship between performing loan and bank profitability.

Since the Sig value above is -4.211380 which is compared to 0.05. -4.211380<0.05 we accept the null hypothesis that performing loan does not significantly affect bank profitability in Nigeria.

4. Summary and Conclusion

The main purpose of this research is to investigate the impact of credit risk management on commercial banks' financial performance. The researcher's idea of creating a linear model on GMM method is to test the effectiveness of bank's credit risk management system in Nigeria. However, the negative coefficient of the NPL and positive coefficient of PL in the GMM regression result reveals that in spite of the large number of unpaid loans in the Nigeria commercial banks, the NPL has a negative impact on commercial banks' profitability. This means that the Nigeria commercial banks need to establish an appropriate credit risk management model to avoid bank ruin through inappropriate credit risk management model. The researchers further concluded that the credit risk management indicators considered in this study are important variables in explaining profitability in Nigeria. Based on the findings from the empirical analysis, the study recommends an appropriate value at risk (VaR) model in managing credit risk in the Nigeria banking sector.

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