Journal of Corporate Finance Management and Banking System
ISSN: 2799-1059
Vol : 01 , No. 01 , Aug-Sept 2021
http://journal.hmjournals.com/index.php/JCFMBS
DOI: https://doi.org/10.55529/jcfmbs11.26.41

Effect of Firms Attributes on Non-Performing Loans of Listed Deposit Money Banks in Nigeria

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Received: 29 April 2021 **Accepted:** 14 July 2021 **Published:** 17 August 2021

Abstract: ***This study investigates the effect of firm's attributes on non-performing loans of listed deposit money banks in Nigeria. Firm attributes was proxied by (firms size, liquidity and capital adequacy) while non-performing loans was proxied by (the ratio of non-performing loans to total loan). 2010-2019 were the period under review. The study adopts the ex-post-facto research design. Annual data used in the study were sourced from the fact books of the Nigerian stock exchange and the financial statement of the banks. Descriptive statistics, correlation matrix and the ordinary least square (OLS) multiple regression techniques were the main statistical tools used in the analysis of data. Additionally, the study conducted hausman test to choose between the fixed and random effect model which will be acceptable. The anticipated income theory was relied on as it provides the most useful theoretical explanation for the study. The result of the regression reveals that, firm size and liquidity has no significant effect of non-performing loan, while capital adequacy has significant effect on non-performing loans. Based on the findings, the study concludes that the CBN should raise capital adequacy ratio from10% since increasing CAR reduces NPLs base on the findings of this study. Banks should also sure up their capital based because it serve as a buffer and it will enables them absorb the challenges that may arise from the volume of non-performing loan they may encounter..***

Keywords: Firm Size, Liquidity, Capital Adequacy, Non-Performing Loans

1. INTRODUCTION

The banking sector is one of the most regulated institutions anywhere in the world, because of the significance role it plays in the economic development of any nation. Over a decade since the onset of the global financial crisis, it has brought about significant structural changes in the banking sector. The crisis revealed substantial weaknesses in the banking system and the prudential framework, leading to excessive lending and risk-taking unsupported by adequate capital and liquidity buffers.

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Regulators have responded to the crisis by reforming the global prudential framework and enhancing supervision. The key goals of these reforms have been to increase banks' resilience through stronger capital and liquidity buffers, and reduce implicit public subsidies and the impact of bank failures on the economy and taxpayers through enhanced recovery and resolution regimes. The financial crisis of 2008 was a watershed for the banking sector globally. It revealed a pattern of excessive risk-taking and inadequate capital and liquidity buffers within the industry, together with shortcomings in the prudential framework.

The Asset Management Corporation of Nigeria (AMCON) was established by the Federal Government in July, 2010 to buy off trillions of toxic assets to stave off a major collapse of the Nigeria banks. Having succeeded in buying off about 95% of the non-performing loans, the corporation has achieved the primary purpose for which its act was made, with a caveat not to buy new non-performing loans. Before AMCON was created, the country witnessed a consolidation and clean-up of the banks under former Central Bank of Nigeria CBN governors: Charles Soludo and Sanusi Lamido, because most of the banks were substantially under-capitalized, arising mainly from non-performing loans.

Non-performing loans (NPLs) usually slow down with the loans that for a relatively long quantity of it slow do not generate gain, that is the principal and \or interest on loans has remained unpaid for a minimum of ninety days (Caprio and Ktingebiel 2002). value and Renault, (2004) submitted that nonperforming loans (NPLs) has taken a replacement dimension in finance as charge per unit and liability management were, fifteen years past as a results of mounting pressure of non-performing loans (NPLs) on bank's balance sheets and constant banks failure..

Firm-attributes are those factors which characterized individual firms. Those factors can be influenced by managerial decisions and usually associated with the specific policy choices of a particular firm with regard to its efforts to maximize efficiency and improve its risk management. The distinctive features of the banking sector and the policy choices of each specific bank with respect to their efforts for maximum efficiency and improvements in their risk management are expected to exert a decisive influence on the evolution of non-performing loan (Onchomba, 2014).

Various studies have been conducted focusing on firm attributes and their relationships with NPLs. Some of the findings of these studies include those of Hassana et al. (2015) indicated that the bank capital and liquidity considerably affect the non-performing loans level of Greek bank.. Makri et al., (2014) indicated that liquidity of banks has positive effects on NPLs. Awour (2015) focused on bank specifics and NPL and found out that liquidity has a positive relationship on NPLs. Ngungu and Abdul (2020) reveal that liquidity has no significantly effect on banks non-performing loans in Kenya These studies are however characterized by various research gaps. The relationship between NPLs and firm attributes stem from the notion that the levels of NPLs are affected by the state of affairs in banks which is indicated by their specific attributes. The increasing levels of NPLs in the DMB have been a worrisome scenario, which is due to the fact that banks depend on lending activities for their sustainability. The general objectives of this study are to determine how firms attribute affects non-performing loans of deposit money banks; while it's specific objectives are to;

i determine the effect of bank size on non-performing loans of deposit money banks in Nigeria

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ii. examine the effect of liquidity on non-performing loans of deposit money banks in Nigeria
iii. evaluate the effect of capital adequacy on non-performing loans of deposit money banks in Nigeria

Literature Review

Concept of Firm Size

Firm size is one of the most influential characteristics in organisational studies (Pandey, Chotigeat & Ranjit, 2000). Large firms are different from smaller firms, in that larger firms are likely to have more layers of management, greater number of departments increase specialisation of skill and greater bureaucracy than smaller firms (Yegon, 2015).

Larger firms are associated with better diversification capabilities, ability to exploit economies of scale and of scope. Bigger firms are likely to be more profitable as more profit opportunities abound with bigger capital resources than smaller sized firm with smaller capital resources does. On the other hand, larger firms are also associated rigidity and unnecessary bureaucracy that can block profitable opportunities that may require urgent attention. (Goddard, Tavapoli & Wilson, 2005). Firm size can be viewed as in terms of assets owned by the banks because opportunities abound to the firm as result of the assets acquired which are also related to production efficiency. Firm size is described as a quantity and array of production capability and potential or the quantity and diversity of services a firm possesses and can make available concurrently to its clients (Shaheen and Malik, 2012). For the purpose of the study bank size will be view from the perspective of the banks as define by the CBN

Liquidity

The notion of liquidity in the economic literature relates to the ability of an economic agent to exchange his or her existing wealth for goods and services or for other assets. Liquidity can be understood in terms of flows (as opposed to stocks), in other words, it is a flow concept. In our framework, liquidity will refer to the unhindered flows among the agents of the financial system, with a particular focus on the flows among the central bank and commercial banks. Williamsonís (2008)

The availability of cash in the amount and at the time needed at a reasonable cost is called liquidity (Rose, 2015). Liquidity is defined as the ability of a bank to fund increases in assets and meet obligations as they come due, without incurring unacceptable losses (Basel Committee on Banking Supervision 2008). Thus, the Third Basel Accord has reviewed the banking practices in risk management due to the subprime crisis, in order to strengthen the financial system. These agreements have given rise to two main ratios" Liquidity ratios are a class of financial metrics used to determine a bank's ability to pay off its short-term debts obligations. It is the total specified liquid assets of a bank divided by total current liabilities (Basel Committee on Banking Supervision 2010). The higher the value of the ratio, the larger the margin of safety a bank possesses to cover short-term debts. For the purpose of this study the concept of liquidity ratio as stated by the CBN will be used to measure non-performing loan

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Capital Adequacy

Banks capital plays a very important role in maintaining safety and solidarity of banks and the security of banking systems in general as it represents the buffer gate that prevents any unexpected loss that banks might face, which might reach depositors funds, given that banks operate in a highly uncertain environment that might lead to their exposure to various risks, and losses, that might result from risks facing banks.

Capital Adequacy Ratio (CAR) according to the CBN is basically the proportion of the bank's tier 1& tier 2 equity (Qualifying capital or Equity) as a proportion of its risk weighted assets (loans). It is the proportion of a bank's own equity in relation to its risk exposure. If a bank for example, has ₦200 billion risk weighted assets and has a qualifying capital of ₦60 billion then its CAR is ₦60 billion/₦200 billion which is equal to 30%. The capital adequacy ratio (CAR) for banks in Nigeria currently stands at 10% and 15% for national/regional banks and banks with international banking license, respectively. For the purpose of this study the concept of capital adequacy ratio as stated by the CBN will be used to measure non-performing loan.

Non- Performing Loans and Deposit Money Banks in Nigeria

Central Bank of Nigeria (2010), under the Prudential Guidelines, non-performing credit facilities were subject to classification into three categories, namely; sub-standard, doubtful or lost on the bases of certain criteria below:

(1) **Sub-Standard**: The following objective and subjective criteria could be used to identify sub-standard loan:

- Objective criteria: facilities on which unpaid principal and/or interest remain outstanding for more than 90 days but less than 180 days.
- Subjective criteria: facilities which display well defined weaknesses which could affect the ability of borrowers to repay, such as inadequate cash flow to service debt, under capitalization or insufficient working capital, absence of adequate financial information or collateral documentation, irregular payment of principal and/or interest, and inactive accounts where withdrawals exceed repayments can barely cover interest charges.

(2) **Doubtful:** The following objective and subjective criteria should also be used to identify doubtful credit facilities:

- Objective criteria: facilities on which unpaid principal and/or interest remain outstanding for at least 180 days but less than 360 days and are not secured by legal title to leased assets or perfected realizable collateral in the process of collection or realization.
- Subjective criteria: facilities which in addition to the weakness associated with substandard credit facilities reflect that full repayment of the debt is not certain or that realizable collateral values will be insufficient to cover bank's exposure.

(3) **Lost Credit Facilities**: The following objective and subjective criteria should be used to identify lost credit facilities:

- Objective criteria: facilities on which unpaid principal and/or interest remain outstanding for 360 days or more and are not secured by legal title to leased assets or perfected realizable collater al in the course of collection or realization.

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- Subjective criteria: facilities which in addition to the weakness associated with doubtful credit are considered uncollectable and are of such little value that continuation as a bankable asset is unrealistic such as facilities that have been abandoned, facilities secured with unmarketable and unrealizable securities and facilities extended to judgement debtors with no means or fore closable collateral to settle debts.

Review of Empirical Studies

Bank Size and Non-Preforming Loan

Fred (2015) investigated the effects of selected bank specific factors on non-performing loans amongst commercial banks in Kenya. A cross sectional survey design was used in collecting secondary data from (2009-2014). Quantitative data was analyzed using descriptive statistics correlation matrix and regression. Findings from the study revealed that bank size and asset quality has a negative and insignificant effect on NPLs, while liquidity, operational cost efficiency, earnings ability all have positive and significant effect on NPLs. This study was carried out in Kenya where a different regulatory framework exists. The current study is done in Nigeria. The variation in regulatory framework within both countries can produce a different outcome in the study.

Furthermore, Ali and Iva (2013) who conducted study on "the impact of bank specific factors on NPLs in Albanian banking system" considered Interest rate in total loan, credit growth, inflation rate, and exchange rate and GDP growth rate as determinant factors. They utilized OLS regression model for panel data from 2002 to 2012 period. The finding reveals a positive association of loan growth and real exchange rate, and negative association of GDP growth rate with NPLs. However, the association between interest rate and NPL is negative but week. And also inflation rate has insignificant effect on NPLs. The study uses interest rate, exchange rate and GDP which are all micro economic variables, the current study is specifically restricted to firms attributes without the inclusion of any macroeconomic variable.

On his part, Aregawi (2015) examined the causes of non-performing loans and its provision in development bank of Ethiopia. The study sampled 60 firms from both performing and nonperforming clients' and 14 employees using primary data collected through questionnaire and unstructured interview. The findings of the study revealed that demographic characteristics of the clients and employees have significant effect on the repayment of loans. The study concluded that the causes of the non-performing loans are diversion to the other business, marketing problems, inflation condition, lack experts on the business, due to shortage supplies to their business and asymmetric information between the bank and employee. The study uses primary data which can be subjective, while the current study uses secondary data, which is a documented and reliable means of data collection.

Ratan, Kaysher and Sohel (2019) identify the impact of bank-specific factors on non-performing loan in context of private commercial banks of Bangladesh. In this respect, 28 Dhaka Stock Exchange (DSE) listed private commercial banks was studied for the period of 2012-2016. Descriptive analysis, correlation analysis, and regression analysis were used for the study. Findings from the study shows that, net interest income to operating profit ratio and bank size have shown significant negative on NPLs and bank age has depicted significant

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positive impact on non-performing loan. The period under review for this study is very short, not long enough to accommodate changes in policy that may affects firms' attributes

Liquidity and Non-Performing Loan

Awuor (2015) in the context of Kenya carried out a study which was based on secondary data collected from banks for a period of five years (2010 to 2014). The research used multiple regression analysis. The study findings indicate that there is a negative relationship between bank size, asset quality and levels of bank NPLs. There is also a positive connection between liquidity, operational cost efficiency. Unlike this study, the current research is going to be hinged on panel regression analysis. The period under review for this study is also very short, not long enough to accommodate changes in policy that may affects firms' attributes

Makri et al., (2014) did an investigation on the factors predicting the NPLs levels for Eurozone's banking sector where 2000-2008 was the period under consideration. A dynamic panel regression method for our examination specially, a GMM was utilised. The research findings revealed a significant linkage of firm characteristic and NPL levels. The research specifically indicated significant consequence of liquidity on t NPL levels. The research specifically indicated significant consequence of liquidity on the levels of banks' NPLs in Eurozone. The study was thus premised on banks' in Eurozone unlike this enquiry which was on the Nigerian banking sector.

Ngungu and Abdul (2020) specifically examine the effect on liquidity, capital adequacy and bank size on non-performing loans of Kenyan banks, using interest rate as a moderating variable. Secondary data was gathered from the audited financials statement of banks in Kenya. Data analysis was done based on descriptive analysis and panel regression analysis. Findings from the panel regression analysis of the study indicated that liquidity had insignificant effect on non-performing loans, capital adequacy and banks size both had significant effect on non-performing loans. The study introduce interest rate as a moderating variable while the current study adopted only the three specific firms attributes of firm size, liquidity and CAR.

On his part, Warue (2013) carried out a research on the connection between NPL and bank-specifics and macro-economic factors, and scrutinize the level at which they determine the happening of banks' NPLs. The research covers the period 1995-2009 utilizing both secondary and primary data. Principally, a census of forty four Kenyan banks was taken. The study reveals that capital adequacy significantly affects banks nonperforming loans. Liquidity however had insignificant effect on non-performing loans of commercial banks.

Capital Adequacy and Non-Performing Loans

Reyhan and Putu (2020) investigated the effect of capital adequacy ratio and non-performing loan on banking stock prices with profitability as intervening variable in Indonesia, from 2011-2018. The study sample used 4 companies listed on the Indonesia Stock Exchange through purposive sampling method. The results of the analysis show that the CAR variable has a positive effect on ROA, the NPL variable has a negative effect on the ROA variable. CAR variable has a positive effect on stock prices. The number of sample size use for this study was very small compare to all the fourteen listed DMB in Nigeria that the current study used.

Navy and Iramani (2018) examines the effect of good corporate governance, capital adequacy, liquidity and non-performing loan to bank profitability in Indonesia, from 2008-

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2016. The linear regression result from the study revealed that GCG, capital adequacy, and liquidity have significant effect on profitability, whereas Non-performing loan has no significant effect on profitability. The regulatory context can affect the observed relationships and generalizability to the corporations around the world. The outcome of this study is restricted to India with different regulatory framework

A research enquiry was undertaken by Prasanna (2014) on what determines NPLs in the context of India. Yearly panel data was used premised on a dataset of thirty one Indian banks. It relied on the period of 2000 to 2012. The research findings revealed that per capita income alongside savings have momentous impact on NPLs. The findings also revealed that capitals had strong influences on NPLs in India. The study was conducted in India where bank size and regulation are different from that of Nigeria

Hassana, and Rehman (2015) evaluate the effect of bank-specific variables and NPLs in Pakistan. A survey questionnaire was utilised in this research. The results displayed a strong impact by various bank-explicit factors like credit assessment, bank size capital adequacy, monitoring of credit and speedy credit expansion on NPLs, but interest and liquidity had a weak significance on NPLs. The conclusion from the research was that capital sufficiency and bank size have a considerable impact on levels of NPLs. The research however was based on questionnaire which can be subjective in nature as compared to quantitative data which was used in this study.

Hue (2015) did a research on the key factors contributing to NPLs for Vietnam's banking system. The study focused on the period spanning from 2009-2012. An OLS method for panel data became applicable in analysing the connection between the NPLs and various bank characteristics. The research was built on regression analysis with the outcomes revealing that bank size significantly contribute to the banks' NPLs level. The examination was focusing on Vietnam and this ongoing research is on Nigeria

Theoretical Review

Anticipated income theory

This theory was propounded by Prochnow in 1944 based on the practice of extending term loans by the US commercial banks. The theory states that bank liquidity can be planned if scheduled loan payments are based on the future income of the borrower at a point in time hence, regardless of the nature and character of a borrower's business, banks always plan the recovery of term-loan from the anticipated income of the borrower. Kolapo, Ayeni, and Oke, (2012) posited that one striking thing with this theory is its "future-oriented approach" to granting of bank loans and advances. It is also generally known as "cash flow approach" to lending in which case a term loan is for a period exceeding one year and extending to less than five years which by implication banks depends on loan portfolio recovery as liquidity source hence, incidents of loan default could be efficiently managed to reduce loan loss reserves to enhance the performance of banks. For the purpose of this study, the anticipated income theory was adopted because it enables the banks make adequate and substantial provision for loans to avoid possible loss.

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2. METHODOLOGY

This study which is the effect of firms attributes on loan provision of DMB's in Nigeria adopted the ex-post facto research design to determine the relationship between the dependent and independent variables with a view to establishing a link between them. **S**econdary data extracted from the Nigerian stock exchange fact book (NSE) and the financial statement of the listed DMB's was used. This is considered suitable for retrieval of information on the variables of study as data on firm size; firm age and leverage were extracted from the books.

The populations of this study are the fourteen deposits many banks listed in the Nigerian stock exchange as at December 31st 2019. Since the total population of the study is less than thirty (30) the entire population will be used without sampling. The period under review is 2010-2019. The study employed multiple regression analysis as a technique to ascertain the effect of firm attributes (firm size, liquidity and capital adequacy) on non-performing loans of deposit money banks in Nigeria, which is proxied as non-performing loan over total gross loan . The model used for this study was derived from the panel regression equation which combined both regular time-series and cross section regression with the used of double subscript (it) attached to each variable. The model specification here is formulated to test the three hypotheses stated as follows:

$NPL = \beta_o + \beta_1 FZE_{it} + \beta_2 LQD_{it} + \beta_3 CAR_{it} + u_t$

Where:

NPL= Is Non-performing loan

B0= Constant

FZE_{it} = Is Firm Size of bank i at time t,

LQD_{it} = Is Liquidity of bank i at time t,

CAR_{it} = Is CAR of bank i at time t

β_1 to β_4= Is the coefficients of each of the independent variables

u_t =Error Terms

Data Presentation and Analysis

Table 1: Descriptive Statistics

	NPL	BSZ	LQR	CAR
Mean	0.099530	8.566929	0.472981	0.158986
Maximum	0.786800	10.31199	1.083300	0.505400
Minimum	0.003900	5.164668	0.172600	-0.573400
Std. Dev.	0.143852	1.026581	0.158765	0.109924
Skewness	2.879683	-1.697253	1.020929	-2.481580
Kurtosis	12.38652	5.480309	4.609551	18.27345
Jarque-Bera	707.4493	103.1018	39.43238	1504.482
Probability	0.000000	0.000000	0.000000	0.000000
Observations	140	140	140	140

Source: Authors Computation, 2021 (E-views 10)

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Table 1 presents the descriptive statistics of the study which were based on descriptive analysis. All the research variables namely NPLs, bank size, liquidity and capital adequacy had a total number of observations of 140 each. Non-performing loans had 0.099530 as mean and a corresponding standard deviation of 0.1443852. This therefore was an indication that non-performing loans over the study period had been relatively stable. Also, non-performing loans had a minimum and maximum value of 0.003900 and 0.786800 respectively. Bank size had a mean value of 8.566929 and a standard deviation of 1.026581 which indicated that the size of DMB had some fluctuations within the period of the study. Liquidity had a minimum and maximum value of 0.172600 and 1.083300, with a mean value of 0.472981 and a standard deviation of 0.158765. Liquidity has been relatively stable over the years. This indicated that the liquidity regulation by the CBN has been efficient over the years as evidenced by minimal fluctuation. Capital adequacy was reported to have a mean and standard deviation of 0.158986 and 0.109924 respectively. The implication of these statistics was that capital adequacy relatively fluctuated within the study period. The minimum and maximum values were -0.573400 and 0.505400 respectively. This implied that the movements in capital adequacy of DMB were in a wide range.

The analysis was also furnished by the value of the skewness and kurtosis of all the variables involved in the model. Two variables, NPL and LQR were found to be positively skewed, while BSZ and CAR were negatively skewed. Variables with value of kurtosis less than three are called platykurtic (fat or short-tailed), none of the variables during the study period which kurtosis value was less than three, this implies that all the variables are leptokurtic (slim or long tailed) The Jarque-Bera test shows that all the variables are not normally distributed as their probability values were found to be less than 5%. This thus revealed that on the average, the data sets are not normally distributed.

Table 2: Correlation Matrix

	NPL	**BSZ**	**LQR**	**CAR**
LLP	1.000000			
FZE	-0.244826	1.000000		
LQR	-0.155068	0.146798	1.000000	
CAR	-0.500153	0.341051	0.265626	1.000000

Source: Authors Computation, 2021 (E-views 10)

The correlation matrix in table 2 shows that the correlation between firms attributes variables (BSZ, LQ and CA) which are the independent variable and NPL the dependent variable is negatively correlated, suggesting that multicollinearity problems are not severe and confirming that the model employed is sound and reliable (Kennedy, 2008). In this regard, the correlation between each of the variables is not high and the maximum degree of correlation found is very satisfactory.

Hausman Test

The Hausman test is formulated to assist in making a choice between the fixed effects and random effects approaches. For the panel data, the appropriate choice between the fixed effects and the random effects methods involves investigating whether the regressors are correlated with the individual (unobserved in most cases) effect. The Hausman statistic may

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be viewed as a distance measure between the fixed effects and the random effects estimators. Thus, we actually test:
H_0: Random effects are consistent and efficient, versus;
H_1: Random effects are inconsistent (as the fixed effects will be always consistent).
The result of the Hausman Test is presented in Table 3 below:

Table 3: Hausman Test Result

Correlated Random Effects - Hausman Test			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.685996	3	0.4426

Source: Authors Computation, 2021 (Eviews-10)

In the result shown in Table 3, the Hausman Test for random argument reveals that the Chi-square statistics of about 2.685996 (with a probability value of 0.4426) is greater than the critical Chi-square value of 3. This provides a strong argument for the null hypothesis that there is a misspecification when fixed effect model is employed and thus provides the justification for the acceptance of the random effects estimates. The implication of this is that the random effects model will not be bias and inconsistent as shown in Table 3.

Table 4: Regression Result:
Random Effect Estimation Result and Test of Hypothesis

Dependent Variable: NPL				
Method: Panel EGLS (Cross-section fixed effects)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
BSZ	-0.015721	0.011739	-1.339241	0.1827
LQR	-0.016744	0.070221	-0.238451	0.8119
CAR	-0.588679	0.105176	-5.597092	0.0000
C	0.335723	0.099879	3.361303	0.0010
R-squared	0.250331			
Adjusted R-squared	0.233794			
F-statistic	4.502960			
Prob(F-statistic)	0.000000			
Durbin-Watson stat	1.447727			

Source: Authors Computation, 2021 (Eviews-10)

Using the f-statistic, the study sought to evaluate the overall validity of the random effect multiple regression model. The F-statistics was used to establish whether the model is valid or not. The study found that the model was valid given the F-value of 4.502960 and associated P-value of 0.000000 which was seen to be less than 0.05. Therefore, this implies that all the three predictors (BSZ, LQ and CA) variables are good at explaining variations in non-performing loans of deposit money banks in Nigeria.

The R^2 (R-square) value of 0.250331 (25.03%) shows that firm attributes variables have a reasonable impact on non-performing loans of listed deposit money banks in Nigeria. It indicates that about 25.03% of the variation in non-performing loan of listed deposit money

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banks in Nigeria is explained by the three firm attributes, while the remaining unaccounted variation of 74.97% captured by other variables and the residual.

The Durbin Watson (D.W) statistics of 1.44 as it is, is significantly within the bench mark of 2; thus, we can conclude that there is no auto-correlation or serial correlation in the model specification; hence the assumption of linearity between error term and independent variables is not violated.

Statistical Test of Hypothesis

This research used 5% level of significance $\alpha = 0.05$ (or 95% level of confidence). This means that, the null hypothesis will be rejected only if the sample result is so different from the hypothesized value and the different of that amount smaller and larger would occur by chance with a probability of 0.05 or less. If the PV is less than 5% or 0.05 (that is, PV < 0.05), it implies that the variable is statistically significant at 5% level; otherwise, it is not significant at that level.

Hypothesis One

(H_{01}): Bank size has no significant effect on non-performing loans

The random effects regression in Table 3 showed that the calculated t-value for bank size is -1.339241 and its associated probability value is 0.1827 Since the probability value is greater than 0.05 at 5percent level of significance, it thus falls in the acceptance region and hence, the first null hypothesis **(H_{01})** was accepted. The result thus shows that bank size has no effect on loan provision of deposit money banks in Nigeria.

Hypothesis Two

(H_{02}): Liquidity has no significant effect on non-performing loan of deposit money banks in Nigeria

The random effects regression result in Table 3 indicated that the calculated t-value for liquidity was found to be -0.016744 and its pvalue is 0.8119. Since the probability value is greater than 0.05 or 5percent level of significance, it fell in the acceptance region and hence, we accepted the second null hypothesis **(H_{02})** and conclude that liquidity has no significant effect on non-performing loans of listed deposit money banks in Nigeria

Hypothesis Three

(H_{03}): Capital Adequacy has no significant effect on non-performing loans in Nigeria

From the random effects regression result in Table 3, it could be seen that the t-value for Capital adequacy was found to be 0.588679 and its associated probability value is 0.0000. Since the probability value is less than 0.05 or 5percent level of significance, it falls in the rejection region and hence, we reject the third null hypothesis **(H_{03})**. The conclusion here is that capital adequacy has a significant effect on non-performing loans of listed deposit money banks in Nigeria.

3. DISCUSSION OF FINDINGS

Findings from the study showed that bank size has a negative co-efficient value of -0.015721 and an insignificant pvalue of 0.1827. The results showed that a percentage change in bank size, on the average, increases NPLs negatively by -0.0436856. This shows that bank size of listed DMB does not influence NPLs. The outcome of this study is in agreement with the study of Fred (2015), which study revealed that bank size has a negative and insignificant

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Journal of Corporate Finance Management and Banking System
ISSN: 2799-1059
Vol : 01 , No. 01 , Aug-Sept 2021
http://journal.hmjournals.com/index.php/JCFMBS
DOI: https://doi.org/10.55529/jcfmbs11.26.41

effect on NPLs and also supported by Ratan, Kaysher and Sohel (2019) whose study also revealed that firm size has no significant effect on NPLs. The study was however in contrast with that of Ngungu and Abdul (2020) whose study revealed that firm size has significant effect on NPLs

Furthermore, the study also revealed that liquidity has a negative co-efficient value of -0.127502 and insignificant pvalue of 0.8119. The results showed that a percentage change in liquidity on the average, increases non-performing loan negatively by -0.127502. This shows that liquidity of listed deposit money banks does not influence their non-performing loans. The finding of this study is in agreement with the study of Awuor (2015) which is on the effect of bank characteristics and non-performing loans of commercial banks. The study found that liquidity had an insignificant effect on non-performing loans. It is also agreement with the study of Ngungu and Abdul (2020) which specifically examine the effect on liquidity, capital adequacy and bank size on non-performing loans of Kenyan banks and found that liquidity has a negative and insignificant effect on non-performing loans.

Lastly, findings from the study showed that capital adequacy with a co-efficient negative value of -0.588679 and a positive pvalue of 0.0000 respectively has a negative and significant effect on non-performing loans of DMB in Nigeria. This suggests that capital adequacy does have an inverse influence on the non-performing loan of DMB. It showed that a unit change in capital adequacy on the average reduces non-performing loans by -0.03369. This is in-line with Prasanna (2014) on what determines NPLs in the context of India. The research findings revealed that capitals had strong influences on NPLs in India.

4. CONCLUSION AND RECOMMENDATION

The conclusion of the study was informed by the various findings of the study. With respect to bank size the study have negative and insignificant effects on NPLs. The study concluded that the size of a bank is not a key factor in determining their level of NPLs. With regards to liquidity the study revealed that liquidity was not significant. The study concluded that liquidity of DMB in Nigeria can only influence their NPLs negatively; owning to the fact that the liquid nature of the banks shows that they are not giving enough loans to their customers. Finally on capital adequacy, the study indicated that capital adequacy was significant in determining the non-performing loans of commercial banks. The conclusion of the study was that the levels of non-performing loans of DMB in Nigeria were highly influenced by the capital adequacy levels of banks. This was expected as the funded banks were able to manage non-performing loans.

The following recommendations for policy were guided by the study findings as they are based on only variables which significantly predicted the levels of NPLs.

1. Rather than growing the assets of the banks that has negative and insignificant effects on NPLs, banks should channel such asset to ventures that can yield interest income and not on wasting assets that does not yield any benefit to the banks.
2. Liquidity ratios of banks should also be increase from the current 30% as stipulated by the CBN as it will help to reduce loanable funds in the hands of DMB.
3. The CBN should raise capital adequacy ratio from 10% since increasing CAR reduces NPLs base on the findings of this study. Banks should also sure up their capital based

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http://journal.hmjournals.com/index.php/JCFMBS
DOI: https://doi.org/10.55529/jcfmbs11.26.41

because it serve as a buffer and it will enables them absorb the challenges that may arise from the volume of non-performing loan they may encounter.

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Appendices

Appendix 1: Descriptive Statistics

Date: 08/01/21 Time: 04:05					
Sample: 2010 2019					
	NPL	C	BSZ	LQR	CAR
Mean	0.099530	1.000000	8.566929	0.472981	0.158986
Median	0.038300	1.000000	8.902277	0.462150	0.170400
Maximum	0.786800	1.000000	10.31199	1.083300	0.505400
Minimum	0.003900	1.000000	5.164668	0.172600	-0.573400
Std. Dev.	0.143852	0.000000	1.026581	0.158765	0.109924
Skewness	2.879683	NA	-1.697253	1.020929	-2.481580
Kurtosis	12.38652	NA	5.480309	4.609551	18.27345

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DOI: https://doi.org/10.55529/jcfmbs11.26.41

Jarque-Bera	707.4493	NA	103.1018	39.43238	1504.482
Probability	0.000000	NA	0.000000	0.000000	0.000000
Sum	13.93420	140.0000	1199.370	66.21740	22.25800
Sum Sq. Dev.	2.876364	0.000000	146.4878	3.503682	1.679583
Observations	140	140	140	140	140

Appendix 2: Correlation Matrix

	NPL	C	FZE	LQR	CAR
NPL	1.000000	NA	-0.244826	-0.155068	-0.500153
C	NA	NA	NA	NA	NA
BSZ	-0.244826	NA	1.000000	0.146798	0.341051
LQR	-0.155068	NA	0.146798	1.000000	0.265626
CAR	-0.500153	NA	0.341051	0.265626	1.000000

Appendix 3: Hausman Test

Correlated Random Effects - Hausman Test			
Equation: Untitled			
Test cross-section random effects			
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	2.685996	3	0.4426

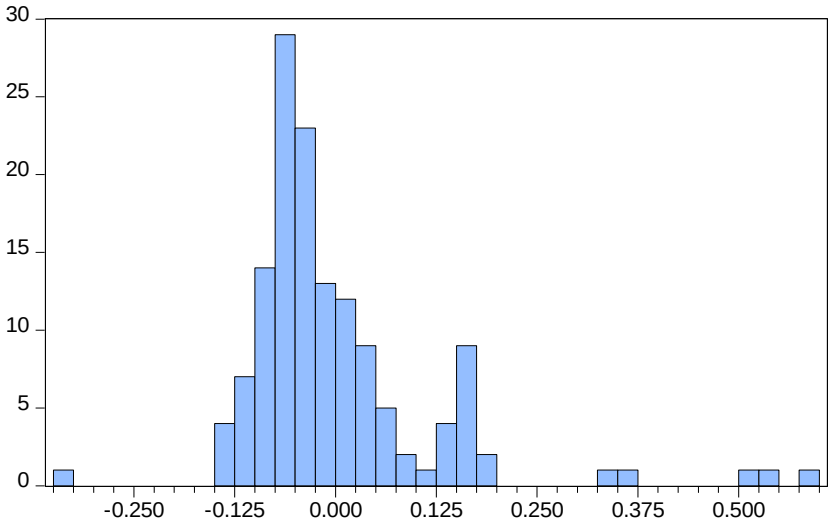
Appendix 4: Random effect model

Dependent Variable: NPL				
Method: Panel EGLS (Cross-section random effects)				
Date: 08/01/21 Time: 04:17				
Sample: 2010 2019				
Periods included: 10				
Cross-sections included: 14				
Total panel (balanced) observations: 140				
Swamy and Arora estimator of component variances				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.335723	0.099879	3.361303	0.0010
FZE	-0.015721	0.011739	-1.339241	0.1827
LQR	-0.016744	0.070221	-0.238451	0.8119
CAR	-0.588679	0.105176	-5.597092	0.0000

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	Effects Specification			
			S.D.	Rho
Cross-section random			0.033686	0.0715
Idiosyncratic random			0.121437	0.9285
	Weighted Statistics			
R-squared	0.250331	Mean dependent var		0.074822
Adjusted R-squared	0.233794	S.D. dependent var		0.138573
S.E. of regression	0.121297	Sum squared resid		2.000962
F-statistic	15.13781	Durbin-Watson stat		1.447727
Prob(F-statistic)	0.000000			
	Unweighted Statistics			
R-squared	0.255910	Mean dependent var		0.099530
Sum squared resid	2.140275	Durbin-Watson stat		1.353493



Series: Standardized Residuals
Sample 2010 2020
Observations 140

Mean	-0.000283
Median	-0.031498
Maximum	0.591470
Minimum	-0.344642
Std. Dev.	0.124053
Skewness	2.198463
Kurtosis	10.50535
Jarque-Bera	441.3685
Probability	0.000000

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