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Effects of Monetary Policy Instruments on Lending Behaviour of Quoted Deposit Money Banks in Nigeria

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ABSTRACT

Monetary policy involves among others the utilization of monetary policy instruments to regulate the value, supply as well as cost of money in nation's economy. Although there are many monetary policy instruments used by the Central Bank of Nigeria, this study however examines the effects of conventional monetary policy instruments in the form of Cash Reserve Ratio (CRR), Monetary Policy Rate (MPR) and Open Market Operation (OMO) on the lending behaviour of quoted Deposit Money Banks (DMBs) in Nigeria. Ex-post facto and causal research designs are used on data collected from the annual reports of the sampled DMBs for the period spanning through 2007 to 2016. Panel regression was used on the panel data collected and it was found from the random effect model that Cash Reserve Requirements, Open Market Operation and Deposit Ratio were negatively related to lending behaviour of banks with statistical insignificance. However, a significant negative effect of Monetary Policy Rate on Lending Behaviour was found while Exchange Rate was found to have a significant positive effect on lending behaviour of quoted DMBs. The study concludes that quoted DMBs' ability to grant more credit is not significantly influenced by CRR, OMO and Deposit mobilization. However, lending behaviour of the DMBs significantly reduces as MPR increases, but increases as Exchange Rate increases. The study recommends that, CBN should reassess the use of CRR and OMO as the instruments of monetary policy if the objective of the policy is to influence lending of the quoted DMBs. Monetary policy Rate should also be reviewed to an optimal level that would ensure cost of borrowing supports reasonable access to finance by productive sectors of the economy.

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KEYWORDS: Monetary Policy, Open Market Operation, Cash Reserve Ratio, Monetary Policy Rate, Exchange Rate, Loans & Advances and DMBs

1. INTRODUCTION

The Central Bank of Nigeria like many other Central Banks uses monetary policy instruments to achieve a number of macroeconomic goals like economic growth, low inflation, low unemployment, healthy balance of payment and availability of credit among others. It is worthy to mention that Nigeria has just exited from recession and one of the basic tools of economic recovery and sustainability is availability of finance to the appropriate sectors of the economy. To this end, the country must ensure that the intermediation role of the Deposit Money Banks (DMBs) remain effectively discharged. It is however, important to understand that an effective discharge of intermediation by DMBs is only possible when the right atmosphere is provided by the Government. This would range from, stable political environment with adequate security of life and property including the right and effective legal system down to conducive regulatory and supervisory atmosphere. While it is obvious that achieving this requires collaborative effort of both monetary and fiscal authorities, it would however be impossible to achieve even with the required harmony between the two authorities unless an appropriate and effective monetary policy instruments are selected and applied. This, therefore brings us to the question, how effective are the monetary policy instruments of the Central Bank of Nigeria in achieving the monetary policy goals of the CBN particularly that of lending.

Although studies in relation to monetary policy instruments and banks' lending behaviour have been conducted, most of these studies gave credence to developed countries and even those that were conducted in Africa do not seem to have significance to Nigeria context (Punita & Somaiya, 2006;

Simpasa, Nandwa & Nabassaga, 2014; Mutwol & Kubasu, 2016; Dhungana, 2016; Bhattarai, 2016). More so the studies conducted in this area used mostly ordinary least square method of regression (OLS) (see Mohammed, 2006; Olokoyo, 2011; Kimani, 2013; Olutoye & Emmanuel, 2015; Benjamin & Onyewuchi, 2015; Simpasa, Nandwa & Nabassaga, 2014; Mutwol & Kubasu, 2016; Dhungana, 2016), as most of the studies used time series data which seems not to have explained the individual or cross sectional effect of the sampled banks given their respective peculiarities, and that, panel data address a broader range of issues and tackle more complex problem than would be possible with either pure time series or pure cross sectional data alone. A more robust analysis could be conducted using panel regression (fixed or random effect model) on the panel data as it explains better the explanatory variables than the OLS regression. It is indispensable to note that, the studies conducted in Nigeria with respect to monetary policy instruments and lending behaviour of banks did not bother to used panel regression (see Olokoyo, 2011; Ayodele, 2014; Olutoye & Emmanuel, 2015; and the latest work of Benjamin & Onyewuchi, 2015). However, some foreign studies such as Said and Ismail (2008) in Malaysia, and most recent works of Bhattarai (2016) and Timsina (2016) in Nepal, as well as Mukhanyi (2016) in Kenya all used panel regression in this respect. Thus the need to adopt the panel regression model in the Nigerian context given its advantages is important. Thus this study expands the frontier of knowledge by feeling these gaps identified in literature by making use of the panel regression model to examine the effect of monetary policy instrument in terms of Cash Reserve Requirements (CRR), Open Market Operation (OMO) and Monetary Policy Rate (MPR) on lending behaviour of quoted DMBs in Nigeria. Worthy to note is that, the study introduces banks' deposit ratio and Exchange rate as control variables to facto in the effect of savings mobilization by quoted DMBs and macro variable on the ability of banks to extend credits to customers.

Following the highlighted gaps expected to be filled by this study, the following research question ensued:

Q1: What is the effect of Monetary Policy Instruments on lending behaviour of quoted DMBs in Nigeria?

To answer the above research question, the following research hypothesis has been formulated and stated in a null form.

H_1: Monetary Policy Instruments have no significant effect on lending behaviour of quoted DMBs in Nigeria.

2. LITERATURE REVIEW

2.1. Cash Reserve Requirements and Lending Behaviour

Mutwol and Kubasu (2016) examine the effects of some selected monetary policies on credit performance amongst banks in Kenya. The study utilises thirty (30) commercial banks and thirty (30) credit officers representing each of the sampled banks used for data collection. Questionnaires were used for the collection of primary data and the Central Bank of Kenya Statistical Bulletin was used for secondary data. The variables used in the study are Open Market Operation, Central Bank discount rate, reserve ratio and Kenya interbank rate as predictor variables. The explained variable in the study is the loan portfolio performance. Phi and Cramer's V test was done to create the strength of the relationship subsists between the explanatory and explained variables of the study as Chi-square (X^2) was applied to test for the significance of each of the predictor variables. Furthermore, the study uses multiple regression and it was found that, the effect of monetary policies in terms of OMO, Central Bank discount rate, reserve ratio and Kenya interbank rate on loan portfolio performance of banks in Kenya is insignificant. The work of Mutwol and Kubasu (2016) did not bother to run the pre and the post residual diagnostic test to ensure the robustness of the result. This can be said to be responsible for the insignificant effect noticed in all the variables studied.

Dhungana (2016) examines the effects on lending of monetary policy in Nepal. The research designs adopted in the study are the descriptive and causal designs. Data were collected from banking and financial statistics, quarterly economic bulletin and annual audited reports of the twenty (24) sampled banks in Nepal out of the population of thirty (30) banks as at 2015. The analytical tools used were descriptive statistics, correlation analysis and linear regression for the period of 1996 to 2015. It was found that, cash reserve ratio and open market operations are negatively related to lending behaviour of Nepal with statistical significance. However, a significant positive effect of bank rate on lending behaviour was found. Panel regression analysis would have been used to capture the cross sectional or individual effects of the sampled banks because of their peculiarities.

Bhattarai (2016) assesses the determinant of lending behaviour of Nepalese commercial banks using variables such as loans and advances to measure lending behaviour, and bank size, liquidity, investment portfolio, cash reserve ratio, deposit to capital ratio as the determinants. The study utilises four commercial banks in Nepal for the period spanning through 2007 to 2014. Data were collected from the Nepalese banks and were analysed using regression analysis. It was found based on the regression result that, bank size is positively related to loans and advances with statistical significance. He argues that Nepalese banks are more willing to extend credit as they expand in terms of their total assets. However, the study argues that cash reserve requirement ratio, liquidity and investment portfolio decrease the banks' intention and penchant to extend further credit to customers. This is as a result of the significant negative result noticed in the regression analysis. In the case of deposit to capital ratio, the study reveals a significant

positive effect on lending behaviour. Thus, reported that banks have more on ground to extend credit to customers when they are able to mobilize saving from customers. It is sufficed to say from this study that, the study was conducted in Nepal and data used in the analysis only stopped at 2014. Furthermore, the study only looked at variables such as bank size, liquidity, investment portfolio, cash reserve ratio and deposit to capital ratio. Other variables such as open market operation, customer deposit as well as exchange rate would have been looked at, since they seem to command great influence on the lending behaviour of banks. Again the use of OLS does not seek to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities.

2.2. Open Market Operation and Lending Behaviour

Timsina (2016) examines the determinants of lending behaviour in Nepal. The study utilizes bank loans and advances as dependent variable, while cash reserve ratio, open market operation, bank rate, bank assets, capitalization and liquidity as independent variables. Panel data were used which were collected from the twenty (24) commercial banks of Nepal for the period of twenty years spanning through 1996 to 2015. Descriptive statistics, correlation matrix and regression analysis were used for the analysis and it was found that, cash reserve ratio and open market operation are negatively related to loans and advances with statistical significance. Conversely, the study found positive and significant effects of bank rate, bank assets, capitalization and liquidity on loans and advances. The study was only limited to a time period (i.e. 2015) that requires an update to 2016 to make it more current. Again the study was conducted using Nepalese data, and the need to conduct similar research using Nigeria data could make a great deal of difference.

Sheyin (2015) examines the impact of treasury bills returns on financial intermediation in Nigeria. Loans and advances was used to proxy financial intermediation as dependent variable, while total deposits, treasury bills, federal government bonds, interbank rates, and the yield spread between loans and treasury bills were used as independent variables. The study utilizes vector error correction (VEC) model for analysis on quarterly data for the period of 2003 to 2013. It was found that Treasury bill is negatively related to loans and advances with statistical significance. That the spread between credit to private sector and treasury bills return determined their demand in the short-run. Federal Government Bonds had a more significant negative effect on financial intermediation than Treasury bills. It is concluded that demand for governments' deficit financing instruments reduced financial intermediation in Nigeria but runs more through FGN Bonds than through treasury bills. Although the study was conducted in Nigeria and the analyses were done in a manner that they are expected to be done, the time covered in the study needs to be updated. Since the study was limited to 2013, the need to make it up to 2016 is indispensable.

Udoka, Bassey and Arikpo (2015) examine the effects of interest rate on bank lending behaviour in Nigeria. The study utilizes variables as loans and advances to proxy lending behaviour, while deposit rate, lending rate, treasury bills rate and policy rate were used as independent variables. The study adopted ex-post facto research design and time series data were collected from the CBN Bulletin for the period spanning through 1980 to 2013. Ordinary least square method of regression (multiple) was used and found that, except for lending rate that is positively significant to loans and advances, other variables (i.e. deposit rate, monetary policy rate, and treasury bill rate) were found to be negative and significant to lending behaviour of banks in Nigeria. The study although was conducted in Nigeria, was limited to 2013. Again the use of OLS does not seem to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities. Panel data stand to tackle a more set of problems and address more sophisticated issues than either pure time series or pure cross sectional data alone would address. Thus the use of panel regression is capable of given more robust result that can be acceptable than OLS. More so, since the study was limited to a time frame of 2013, efforts could be made to expand the horizon to 2016.

Simpasa, Nandwa and Nabassaga (2014) in their study, Bank lending channel of monetary policy transmission in Zambia using baseline estimation regression on data collected from the commercial banks' prudential reports on balance sheet and capital positions, and the income statement submitted to the bank of Zambia found that, monetary policy has only a moderate lagged effect on banks' loan supply. It was further found that Treasury bill has negative and insignificant effect on lending behaviour at 5% level of significance. However, at 10% the Treasury bill was found to be significant. Bank specific variables (i.e. bank size, liquidity, capitalization) are found to be negative but significant at 10%. The macroeconomic variables are found to be insignificant. Similarly, other variables such as global financial crisis are reported to be insignificant to lending behaviour. Conversely, bank ownership with dichotomous variables used was found to be significant. This study gave attention to Zambia, and given their peculiarities with Nigeria it is important to have a similar look at Nigerian situation.

2.3. Monetary Policy Rate and Lending Behaviour

Ayodele (2016) assesses the effects of monetary policy on lending of commercial banks in Nigeria. The study utilises data collected from the CBN and NBS for the period of 1988 to 2008. Test of stationary and co-integration test were run before the ordinary least regression analysis, and it was found that a long run relationships exist among the variables of the study as revealed by the Vector Error Correction Model. The regression result indicates positive and

significant effects of both exchange rate and interest rate on lending behaviour of banks in Nigeria, whereas, money supply and liquidity ratio are found to be negative but significant to lending behaviour of banks in Nigeria. This study only gave credence to variables such as exchange rate, liquidity ratio, money supply and interest rate. Attention was not given to other instruments like cash reserve requirements and open market operations. These would have better explained the lending behaviour of banks in Nigeria. Again the use of OLS does not seek to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities.

Ayieyo (2016) examines the determinants of lending behaviour in selected commercial banks in Kenya. Lending behaviour was proxied by loans and advances, whereas volume of deposit and interest rate were used as the determinants (independent variables). The research design adopted for the study is co-relational. The ten (10) listed on the floor of the Nairobi security and exchange commission as at 2012 were used as the study population. Census method of sampling was used and nine (9) banks were selected for the study. Ordinary least square method of regression was used on time series data collected from the Nairobi security exchange for the period of ten years spanning through 2002 to 2011. The study found that volume of deposit is positively related to loans and advances with statistical significance, while a significant negative effect of interest on loans was found. The study gave attention to only Kenya and the data used in the analysis only stopped at 2011. Furthermore, the study only looked at variables such as volume of deposit and bank interest rate. Variables such as open market operation and cash reserve requirements among others would have been looked at, since they seem to command great effect on the banks' lending behaviour. Again the use of panel regression seeks to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities. Panel data stand to tackle a more set of problems and address more sophisticated issues than either pure cross sectional or time series data alone would address. Thus the use of panel regression is capable of given more robust result that can be acceptable than OLS.

Lucky and Lyndon (2016) examine the determinants of commercial bank lending policy in Nigeria. The determinants used in the study are Gross Domestic Product (GDP), Prime lending rate, exchange rate, and inflation rate. The study data are collected from CBN Bulletin for the period of 30 years (i.e. 1985-2014). The ordinary least square method of regression (OLS) was applied and it was found that, GDP has positive and significant relationship with lending behaviour. Similarly, exchange rate and inflation rate revealed significant positive effects on bank lending behaviour. Conversely, a significant negative effect of prime lending rate on bank lending behaviour was found. The study was conducted without both pre and post residual diagnostic test to ensure whether the estimation is BLUE (Best Linear Unbiased Estimator) for robust regression result. Thus, this is capable of given spurious result. The study is purely on macroeconomic variables such as GDP, Prime Lending rate, Exchange rate, and Inflation rate. However, variables such as, open market operation could have said to influence the lending behaviour. These ought to be given attention. The need to update the data to capture more recent time is also indispensable since the study stopped at only 2014. There is need to update it to 2016.

Getahun (2014) examines the determinants of lending behaviour of banks in Ethiopia. Loans and advances was used to proxy the lending behaviour as dependent variable, while deposit volume, bank size, cash reserve requirement, interest rate, inflation rate, liquidity ratio as well as gross domestic product were used as the determinants (independent variables). The study utilizes nineteen (19) commercial banks in Ethiopia as population and purposive sampling method was used to select only nine banks for the study. Data from audited financial statements of the sampled banks for the period of eleven (11) years spanning through 2003 to 2013 were collected. The study utilizes descriptive statistics, correlation matrix and panel regression (fixed effect) for the analysis. It was found that, volume of deposit, bank size, cash reserve ratio, gross domestic product and inflation rate are positively related to lending behaviour of banks with statistical significance. However, significant negative effects of interest rate and liquidity ratio on loans were found. In the case of gross domestic product, insignificant positive effect on lending behaviour was found. It is sufficed to say from this study that, attention was only given to Ethiopia and the data used in the analysis only stopped at 2013. Furthermore, the study only looked at variables such as bank size, liquidity ratio, cash reserve ratio, volume of deposit, bank interest rate, inflation rate and GDP. Variables such as open market operation would have been looked at, since they seem to command great effect on the banks' lending behaviour. Again the use of panel regression seeks to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities. Panel data stand to tackle a more set of problems and address more sophisticated issues than either pure pure-cross sectional or time series data alone would address. Thus the use of panel regression is capable of given more robust result that can be acceptable than OLS.

Jonas and Samuel (2013) examine the determinants of bank lending behavior in Ghana. The study utilizes GMM-System estimator developed by Arellano and Bover (1995) and Blundell and Bond (1998) and found that, bank size and capital structures have positive effects on bank lending behaviour with statistical significance. Conversely, negative and significant effects of central bank lending rate and exchange rate on bank lending behaviour in Ghana were found. In the case of competition in the industry, a positive and significant effect on bank lending behaviour was

revealed. Also, banking relationship was found to have positive relationship with banks' lending behaviour in Ghana. This implies that, effective policies that are targeted at maintaining stable macroeconomic fundamentals would greatly accelerate lending decisions of banks in Ghana. This study gave credence to only Ghana, as attention was not given to Nigeria. Furthermore, the study was limited to 2011. However, given the recent monetary policies in place, the need to review or revisit this area is important.

2.4. Customers' Deposit and Lending Behaviour

Timsina (2017) examines the determinants of bank lending in Nepal. The study made use of the private sector credit, interest rate, volume of deposit, cash reserve requirement, liquidity ratio, exchange rate, gross domestic product and inflation rate. Variables such as government policies, past relationship and central banks' guidelines with customers were used. Ordinary least square method of regression was used on data collected from the banking and financial statement of Nepal Rastra Bank (NRB), Economic survey (ministry of finance), quarterly economic bulletin, annual reports of banks, for the period spanning through 19975 to 2014. Based on the aggregates data collected, the OLS depicts that, volume of deposit is positively related to bank lending behaviour insignificantly. However, interest rate, cash reserve ratio, and inflation rate were found to be negative and insignificant. In the case of liquidity ratio, a significant negative effect was found on lending behaviour. Exchange rate indicates insignificant positive effect, and a significant positive effect of gross domestic product on bank lending behaviour was found. The study could have captured more determinants of lending behaviour such as open market operations among others. Again the study was only limited to a time period that spans through 1975 to 2014 that requires an update.

Mukhanyi (2016) examines the determinants of lending behaviour of commercial banks in Kenya. In the study, variables such as loans and advances, bank size, cash reserve ratio, interest rate spread (difference between lending rate and deposit rate), bank capitalization, real gross domestic product and volume of deposit were used. The study collected data from Central Bank of Kenya (CBK) covering the periods of 2006 to 2015. The study data are on the thirty five (35) commercial banks in Kenya. The study also used panel regression which helps in controlling for unobserved heterogeneity, thus, increasing the possibility of obtaining findings that are not biased. Based on the panel regression result, it was found that bank size is positively related to lending behaviour with statistical insignificance. In the case of interest rate spread, bank capitalization, and volume of deposits, significant positive effects were found on lending behaviour. It is only GDP that reveals a significant negative effect on lending behaviour. The study could have captured more determinants of lending behaviour such as open market operations among others. Furthermore, although panel regression analysis was used, key residual diagnostics test were not conducted (i.e. heteroskedasticity and multicollinearity). Unless these are conducted, the assumption of the regression analysis could have said not to have been made. Again the study was only limited to 2015. More attention could be given to 2016 to update the study.

Olokoyo (2011) examines the determinants of lending behaviour of commercial banks in Nigeria. The study utilizes variables such as loans and advances to proxy the dependent variable, deposits volume, lending interest rate, gross domestic product, investment portfolio, cash reserve ratio, exchange rate, and liquidity ratio to proxy the independent. Secondary data were collected from the 89 commercial banks as at 2005. These data were collected from the CBN Bulletin and National Bureau of statistics for the period spanning through 1980 to 2005. Ordinary least square method of regression was used and it was found that, the model is significant with the result of the estimators as expected. However, bank deposits have the greatest impact on lending behaviour than any other variable studied. The study could have captured more determinants of lending behaviour such as open market operations among others. Furthermore, panel regression analysis would have been used to capture the cross sectional or individual effects of the sampled banks because of their peculiarities. Again the study was only limited to a time period (i.e. 2005) that requires an update.

Bingilar and Andabai (nd) examine the effect of deposit mobilization on lending behaviour of banks in Nigeria. Aggregate bank capital was used as proxy for deposit mobilization, while loans to manufacturing sector and agricultural sector was used to measure lending behaviour. The study utilizes secondary data collected from the CBN Bulletin and National bureau of statistics (NBS) for the period of nineteen (19) years spanning through 1996 to 2014. Multiple regression, correlation and percentages were used for the analysis and fond that, deposit mobilization is positively related to credit to manufacturing sector with statistical significance. However, insignificant positive effect of deposit mobilization on credit to agricultural sector was found. The study although was conducted in Nigeria, was limited to 2014. Again the use of OLS does not seem to explain the individual or cross sectional effect of the sampled banks given their respective peculiarities. Panel data stand to tackle a more set of problems and address more sophisticated issues than either pure time series or pure cross sectional data alone would address.

2.2.8 Exchange Rate and Lending Behaviour

Akpan and Atan (nd) examine the effects of exchange rate movements on economic growth in Nigeria. The study utilizes quarterly data for the period of 1986 to 2010. It was centred on both the direct and indirect relationship between exchange rate and GDP growth. A Generalised Method of Moments (GMM) technique was used. The study found no evidence of strong direct relationship between changes in exchange rate and output growth. Further found in the study

was the more linked of economic growth and monetary variables. This study gave credence to exchange rate and economic growth in terms of GDP. Attention was not given to lending behaviour by DMBs in Nigeria. More so, the study was limited to 2010. Thus expanding the horizon is indispensable and the need to look at lending as is related to exchange rate.

Ahmed (2015) studies the effect of foreign exchange exposure on the financial performance of Kenyan commercial banks. The study utilizes both primary and secondary data for analysis. The listed Kenyan commercial banks form the population of his study, as data were collected from Nairobi stock exchange. Descriptive research design was adopted and regression analysis was used. It was found from the regression result that, interest rate has insignificant positive effect on Kenyan banks' financial performance. It was also found that foreign exchange exposure has negative effect on Kenyan banks' performance. The work of Ahmed (2015) was limited to Kenya, and the study was based on financial performance as it was not specific to lending behaviour of banks. This therefore, provides a gap to be filled by looking at Nigeria situation and being particular to lending behaviour as against financial matrix used in the study.

Ilegbinosa, Peter and Lekan (nd) analyse the effects of interest and exchange rates on the Nigerian economy for the period spanning through 1975 to 2008. The study utilises data from CBN Statistical bulletin for analysis. OLS was used having run for unit root and co-integration test. It was found that exchange rate lag is positively related to economic growth with statistical significance. Also, significant negative effects of interest rate and exchange rate are indicated on economic growth in Nigeria. This study was only limited to 2008. Thus lapse of time could necessitate further study in the area. Furthermore, the study was centred on economic growth as against lending or credit growth to be used for the purpose of this study.

Ujuju and Etale (2016) analyse the determinants of commercial banks' lending policy in Nigeria using econometric approach. The study utilizes macroeconomic variables such as Gross Domestic Products, Prime lending rate, exchange rate, and consumer price index (CPI) to regress against loans and advances to customers of quoted Deposit Money Banks in Nigeria. Data were collected for the period of 30 years spanning through 1985 to 2014. These data were collected from the CBN Bulletin for analysis in secondary form. Ordinary least square method of regression was used and found out that Gross Domestic Products, exchange rate, and consumer price index (CPI) have positive correlation with commercial banks' lending behaviour in Nigeria. In the case of prime lending rate, a significant negative effect was found on lending of commercial banks in Nigeria. This study dwelled up to 2014 however attention could be made to 2016 to expand the horizon. Furthermore, the study utilizes OLS to look at the aggregate effects instead of the cross sectional effect. Thus panel regression could be used to enhance the quality of the work by looking at the cross sectional effects of these variables.

2.6. Loan Pricing Theory

The theory of loan pricing was propounded by Stiglitz and Weiss in 1981. It was argued that commercial banks would not want to fix high interest rates with a view to maximizing their profits at the detriment of their customers, since doing that will create problems of adverse selection and moral hazard because forecasting the nature and type of borrower from the scratch is often difficult (Stiglitz & Weiss, 1981). Thus, they argued that, when banks decided to set interest rates that are too high, they may likely induce adverse selection problems since risk takers are willing to take the high rates despite the consequences. However, the moment the customers collect the credit facilities, moral hazard behaviour may be developed as they may undertake projects or investments that are highly risky to be able to pay off the high interest accruable to the facilities and at the same time gain something from it (Chodecai, 2004). This theory is used in previous studies such as Olokoyo (2011); Njeri (2013); Kosak, Li, Loncarski and Marinc (2014); and more recently Timsina (2017).

2.7. Loanable Funds Theory

The proponents amongst this theory are such as Bibow (2000). This theory advocates that, the interest rate is computed on the basis of demand and supply of available funds set out in the capital market for loans. Thus the theory affirms that in the long run, loans interest rate is determined by the function of savings and investments. However, the theory suggests that in the short-run, the financial condition prevalence in the economy of the nation forms the basis of arriving at the interest rate. Thus rate of interest rate is determined by the amount of money available for customers' loan, which is usually instigated by factors such as the customers' deposits, the net increase in currency deposits, willingness to increase cash balances, as well as the chances for the creation of new capitals (Bibow, 2000). Some of the studies that adopted this theory include Punitaa and Somaiya (2006); Njeri (2013); Alhassan, Brobbey and Asamoah (2013); Churchill (2014); and more recently Cucineli (2015).

3. METHODOLOGY

This study utilizes ex-post facto and causal research designs. The study made use of panel data of the quoted DMBs for the period of ten years spanning through 2007-2016 to examine the effects of the independent variables i.e. Cash Reserve Ratio (CRR), Open Market Operation (OMO) and Monetary Policy Rate (MPR) as well as Deposit Ratio (DEPR) and Exchange Rate (EXCR) as control variables on the dependent variable i.e. Loans and Advances. The population of the study is the Fifteen (15) banks quoted on

the Nigerian stock exchange as at 2016 (i.e. Access Bank Plc, Diamond Bank Plc, Ecobank Plc, Fidelity Bank Plc, First Bank of Nig. Plc, First City Monument Bank Plc, Guaranty Trust Bank Plc, Skye Bank Plc, Stanbic IBTC Bank, Sterling Bank Plc, UBA Plc, Union Bank Plc, Unity Bank Plc, Wema Bank Plc, and Zenith Bank Plc). Census sampling technique was used to select the entire (15) quoted DMBs listed on the Nigerian Stock Exchange as at 2016 which formed the population of the study as the sample for the study. The study utilizes secondary data from Banks' Annual Reports, CBN Bulletin and the Nigeria Stock Exchange Market Fact Book for the analysis as Panel regression analysis was used with the aid of Eviews 9.0 to determine and analyze the effects of monetary policy instruments on bank lending behavior to be measured by loans and advances of quoted DMBs in Nigeria. The study was validated using pre and post residual diagnostics test such as Descriptive Statistics, Test of Normality, Correlation Matrix, Hausman Specification Test, Heteroskedasticity Test and Multicolinearity Test.

Panel Regression Model

The model below has been specified in an attempt to determine the effects of monetary policy instruments (CRR, OMO, MPR) and control variables (DEPR, EXCR) on the Lending Behavior (loans and advances) of Quoted Deposit Money Banks' in Nigeria:

$$LOANs = f(CRR, OMO, MPR, DEPR, EXCR)$$

Transforming the relationship into an estimation form, we have:

$$LOANS_{i,t} = \alpha_0 + \beta_1 CRR_{i,t} + \beta_2 OMO_{i,t} + \beta_3 MPR_{i,t} + \beta_4 DEPR_{i,t} + \beta_5 EXCR_{i,t} + \mu_{i,t} \quad (2)$$

Where:

LOANS = Loans and Advances

CRR = Cash Reserve Ratio (Minimum Reserve Requirement)

OMO = CBN Issued Treasury Bills

MPR = Monetary Policy Rate (CBN Monetary Policy Rate)

DEPOSIT = Customers' Deposit

EXCR = Exchange Rate (Official Exchange Rate)

α = Intercept or Regression Constant;

μ= Error Term;

i = cross-sectional dimension;

t = time series.

Variables of the study

Lending Behavior is the dependent variable for the study. The explanatory variables are Cash Reserve Requirements, Open Market Operation and Monetary Policy Rate while Deposit Mobilization and Exchange Rate were used as control variables.

The variables labels, basis of measurement and priori expected sign is presented in table 3.1 below:

Table 3.1: Variables labels, description, measurement and expected sign

S/N	Label	Description	Measurement	A priori Expectation
		Dependent Variable		
1	LOANs	Lending Behaviour	Loans and Advances /Total Assets	N/A
		Monetary policy Instruments		
2	CRR	Cash Reserve Requirement	Amount sterilized at CBN/Total Deposits	Negative
3	OMO	Open Market Operation	Treasury Bills/Total Assets	Negative
4	MPR	Monetary policy Rate	Interest Rate	Negative
		Control Variables		
5	DEPR	Deposit Ratio	Customer Deposit/Total Assets	Positive
6	EXCR	Exchange Rate	Bilateral Official Exchange Rate	Ambiguous

Source: Researcher's summary

4. RESULTS AND DISCUSSION

4.1 Preliminary Analysis

Table 4.1: Descriptive Statistics

	LOANR	CRR	OMO	MPR	DEPR	EXCR
Mean	48.99640	12.23607	8.587933	10.57500	65.91207	169.5310
Median	48.10500	12.00000	6.590000	11.50000	66.03500	157.2950
Maximum	86.71000	51.11000	29.96000	14.00000	125.0200	305.0000
Minimum	22.44000	1.000000	0.010000	6.000000	21.80000	117.9700
Std. Dev.	10.34073	8.614545	6.631850	2.555713	14.88043	49.47261
Jarque-Bera	9.077578	10.02033	20.42241	14.97172	96.13696	143.2699
Probability	0.010686	0.006670	0.000037	0.000561	0.000000	0.000000

Source: Researcher's Computation, 2018 using Eviews Version 9.0

Table 4.1 is the table that described the characteristics of the study variables in terms of loan ratio, cash reserve ratio, open market operation, monetary policy rate, deposit ratio, and exchange rate. The average scored for the respective variables are 48.99, 12.23, 8.58, 10.57, 65.91 & 169.53. The respective Jarque -Bera probability values indicate that, the data are not normal. This would not obstruct the analysis in any way, since the normality is for the residuals.

Figure 4.1 Normality Test

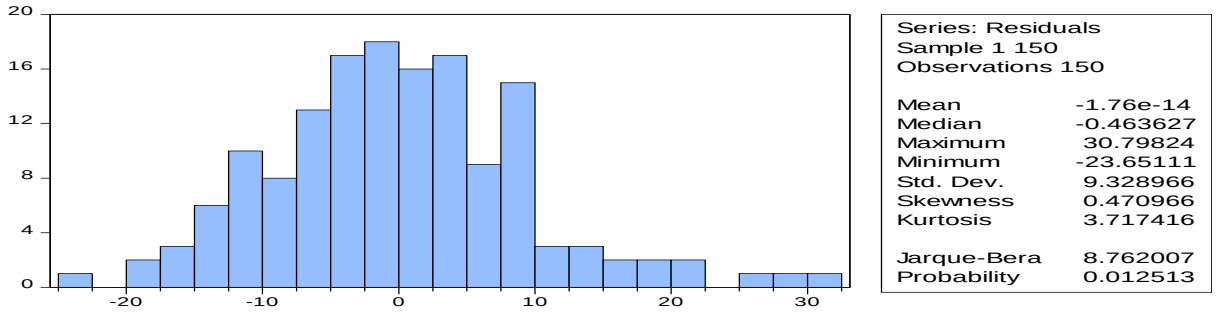

Figure 4.1 is the histogram table for test of normality. It is therefore posits to note that, the Jarque-Bera statistics value and its corresponding p-value of 0.012 indicate absence of normality. This could be attributable to the persistent increase in explanatory variables. However, the study can be continued in spite of this since the normality required is that of the residuals.

Table 4.2 Correlation Matrix

Covariance Analysis: Ordinary
Date: 03/02/18 Time: 08:22
Sample: 1 150
Included observations: 150

Covariance Correlation	CRR	OMO	MPR	DEPR	EXCR
CRR	73.71565				
	1.000000				
OMO	4.352602	43.68822			
	0.076699	1.000000			
MPR	15.77940	3.683122	6.488125		
	0.721524	0.218763	1.000000		
DEPR	21.51312	-0.091032	0.906078	219.9510	
	0.168951	-0.000929	0.023985	1.000000	
EXCR	266.9697	16.46175	67.10293	-5.578501	2431.222
	0.630623	0.050510	0.534281	-0.007629	1.000000

Table 4.2 is a correlation matrix that explains the association among the independent variable. This table clearly depicts positive correlation/association between the explanatory variables. These are given by the respective coefficients of 0.08, 0.72, 0.16, 0.63 for OMO, MPR, DEPR, EXCR

.

Table 4.3 Hausman Specification 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	0.000000	5	1.0000

* Cross-section test variance is invalid. Hausman statistic set to zero.

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CRR	0.028897	-0.018704	0.000599	0.0518
OMO	-0.031470	-0.112685	0.001971	0.0674
MPR	-1.180081	-1.051709	0.002384	0.0086
DEPR	-0.169613	-0.105978	0.001004	0.0446
EXCR	0.092483	0.094863	0.000003	0.1874

Table 4.3 is a Hausman specification test, which guides to choose between the fixed effect and the random effects model. Fixed effect model is only chosen when the probability value is less than or equal to the t-value of 0.05 (5%). However, given the P-value of 1 which is greater than the t-value of 0.05, the Random effect model is chosen against the fixed effect model.

4.2. Test of Hypothesis (Monetary Policy Instruments and Lending Behaviour)

***Table 4.4 Panel Regression (Random Effect Model*)**

Dependent Variable: LOANR
Method: Panel EGLS (Cross-section random effects)
Date: 03/02/18 Time: 08:26
Sample: 2007 2016
Periods included: 10
Cross-sections included: 15
Total panel (balanced) observations: 150
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	52.21784	6.017143	8.678178	0.0000
CRR	-0.018704	0.131155	-0.142612	0.8868
OMO	-0.112685	0.121448	-0.927842	0.3550
MPR	-1.051709	0.398794	-2.637228	0.0093
DEPR	-0.105978	0.060224	-1.759725	0.0806
EXCR	0.094863	0.017758	5.341874	0.0000
	Effects Specification			
			S.D.	Rho
Cross-section random			4.634440	0.2474
Idiosyncratic random			8.083216	0.7526
	Weighted Statistics			
R-squared	0.219556	Mean dependent var		23.66341
Adjusted R-squared	0.192458	S.D. dependent var		9.137330
S.E. of regression	8.211113	Sum squared resid		9708.822
F-statistic	8.102084	Durbin-Watson stat		2.016563
Prob(F-statistic)	0.000001			
	Unweighted Statistics			
R-squared	0.157042	Mean dependent var		48.99640
Sum squared resid	13430.56	Durbin-Watson stat		2.011864

Table 4.4 depicts the Random effect regression model. Thus, the regression line of LOANR = 52.21 – 0.018CRR – 0.112OMO – 1.051MPR – 0.105DEPR + 0.094EXCR indicates that, loans and advances to customers of quoted DMBs in Nigeria decreases with increase in Cash Reserve Ratio (CRR), Open Market Operation (OMO), Monetary Policy Rate (MPR) and Deposit Ratio (DEPR), but increases as Exchange Rate (EXCR) increases. The respective p-values indicate insignificant effects of monetary policy instruments on lending behaviour at 5% level of significance except in the case of MPR and EXCR. The R-Squared of 0.219 indicates that about 22% of variation in lending behaviour of quoted DMBs in Nigeria can be explained by Monetary Policy (CRR, OMO, MPR, DEPR, and EXCR). The remaining 78% is captured by the disturbance or error term. The F-statistics of 8.102 and its p-value of 0.0000 indicate that the model is fit on the regression model.

4.3 Post Diagnostic Tests

Table 4.5 Multicollinearity Test

Variance Inflation Factors
Date: 03/02/18 Time: 08:16
Sample: 1 150
Included observations: 150

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	35.42766	59.01235	NA
CRR	0.022211	8.266609	2.727295
OMO	0.014664	2.868576	1.067116
MPR	0.212544	41.88928	2.297040
DEPR	0.002919	22.19642	1.069621
EXCR	0.000427	22.16115	1.728433

Table 4.5 is a Multicollinearity table that test whether the explanatory or independent variables are highly correlated. These variables can only be highly correlated if the Variance Inflation Factor (VIF) is greater than 10. However, since the respective VIFs are less than 10 (i.e. 2.72, 1.06, 2.29, 1.06, 1.72), this means that there is absence of autocorrelation.

Table 4.6 Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.066997	Prob. F(5,144)	0.1016
Obs*R-squared	7.443655	Prob. Chi-Square(5)	0.0631
Scaled explained SS	18.07724	Prob. Chi-Square(5)	0.0029

Table 4.6 is a heteroskedasticity table which explains the homokedasticity of the study. The Observed R-Squared of 7.443 and the Probability value of 0.0631 is greater than the t-value of 5% which indicates Homokesdasticity of the residuals. This however, reveals absence of heteroskedasticity in the residuals, since the null hypothesis says that the residuals are Homokesdasticity, and the alternative hypothesis says the residuals are heteroskedasticity.

Discussion of Findings

The result of the regression shows that R^2 has a value of 22%. This indicates that about 22% of the variation in Loans and Advances are explained by Cash Reserve Ratio (CRR), Open Market Operation (OMO), Monetary Policy Rate (MPR), Deposit Ratio (DEPR) and Exchange Rate (EXCR). The remaining 78% is explained by error terms and other variables not captured in the model. The F-statistics of 8.102 and its p-value of 0.0000 indicate that the model is fit on the regression model. This implies that the combined effect of the independent variables (CRR, OMO, MPR, DEPR, EXCR) on the dependent variable (Loans and Advances) is statistically significant.

It is evident from the above results and analyses that, Cash Reserve Ratio (CRR) is negatively related to lending behaviour of quoted DMBs in Nigeria with statistical insignificance. This implies that, loans and advances to customers of quoted DMBs in Nigeria, decreases insignificantly as CRR increases. The finding aligns with the loan pricing theory and priori expectation. It is also in agreement with the findings from Dhungana (2016), Bhattarai (2016), Younus and Akhta (2009). It however

contradicts the findings of Ajayi and Atanda (2012); Olutoye and Emmanuel (2015); and more recently Mutwol and Kubasu (2016).

Similarly, Open Market Operation (OMO) was found to have an insignificant negative effect on lending behaviour. This infers that, increase in issuance of treasury bills to quoted DMBs decreases their capacity to extend credit facilities to customers. This is in agreement with the previous works of Simpasa, Nandwa and Nabassaga (2014); Sheyin (2015); Udoka, Bassey and Arikpo (2015) and disagrees with the study of Mutwol and Kubasu (2016).

In the case of Monetary Policy Rate (MPR), a significant negative effect on loans and advances to customers of quoted DMBs in Nigeria was found. This implies that, lending to customers of quoted DMBs in Nigeria significantly decreases when there is an increase in the MPR. This rate usually discourages banks to further extend credits to customers if the rate is not good enough to carter for all the contingencies and required mark up. The finding is supported by the earlier findings in the work of Mohammed (2006); Amidu and Wolfe (2008); Getahun (2014); and more recently, Ayieyo (2016); Lucky and Lyndon (2016). The study is in tandem with the theory of Loan Pricing.

The study also found an insignificant negative effect of Customers' Deposit Ratio (DEPR) on lending to customers by quoted DMBs in Nigeria. This implies that, loans and advances to customers of quoted DMBs in Nigeria decrease with increase in savings mobilization. This is not in line with the study's a priori expectation and does not tally with the conventional wisdom. However, in some cases especially when it is not the priority of the DMBs to grant out loans to customers perhaps owing to the poor lending rate, the banks would not want to extend facilities to customers even when there is increase in savings mobilization. This could also be possible when the yield on government securities are high such that banks prefer to invest in risk free government securities and a higher yield at no risk rather than lending to the customers whose additional yield or premium does not compensate for the additional risk. This finding contradicts the early works of Bhattarai (2016), Ayieyo (2016).

The study finally found a significant positive effect of exchange rate on lending behaviour of quoted DMBs in Nigeria. This means that loans and advances to customers of quoted DMBs in Nigeria increases as exchange rate increases. The finding is supported by the previous findings such as Olusanya, Oyebo and Ohadebere (2012); Ajayi and Atanda (2012); and more recently, Ayodele (2016); Lucky and Lyndon (2016), but inconsistent with Jonas and Samuel (2013).

5. CONCLUSION AND RECOMMENDATIONS

Based on the finding that Cash Reserve Ratio (CRR), Open Market Operation and Deposit ratio which are negatively related to lending behaviour of quoted DMBs in Nigeria with statistical insignificance, the study concludes that lending to customers of quoted DMBs in Nigeria is not majorly influenced by Cash Reserve Ratio, Open Market Operation and Deposit saving mobilization. This means that other variables could have said to determine the lending by quoted DMBs in Nigeria. In the case of Monetary Policy Rate (MPR) and lending behaviour, the study concludes in relation to significant negative effect that lending to customers of quoted DMBs in Nigeria significantly decreases when there is an increase in the MPR. This rate usually discourages customers to collect loans from banks when the rate is high. The banks will be willing to grant out credit facilities to customers when the rate is high in order to enhance their profitability but the customers will not be willing to collect because of the high cost of capital involved.

To this end, the study recommends that the CBN should reevaluate the use of CRR and OMO as monetary policy instruments to influence lending behaviour of quoted DMBs in Nigeria as the instruments do not seem to significantly affect the banks' lending behaviour. Emphasis could be place more on the MPR if the target of the monetary policy is to influence lending behaviour of quoted DMBs in Nigeria in view of the statistical significant of this variable. Considering the costs associated with OMO on the part of the CBN arising from payment of interest on the securities used for the OMO and the statistical insignificant in influencing lending behaviour, its active use as monetary policy instrument should be reassessed. The CBN should consider reviewing the level of the MPR to an optimal level that would ensure cost of borrowing supports reasonable access to finance by productive sectors of the economy.

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