**ARF INDIA**
Academic Open Access Publishing
www.arfjournals.com

# AN EMPIRICAL ANALYSIS OF THE IMPACT OF MONETARY POLICY ON BANK LENDING IN NIGERIA

## Muftau O. Olarinde[1], Yusuf Isah Usman[2], Abdullahi Buba[3] and Musa Abdu[3]

[1]*Department of Economics, Usmanu Danfodio University, Sokoto – Nigeria.*
*E-mail: muftau@gmail.com olarinde.muftau@udusok.edu.ng*
[2]*M.Sc. Candidate, Department of Economics, Usmanu Danfodio University, Sokoto – Nigeria.*
*E-mail: sufisman2014@gmail.com*
[3]*Department of Economics, Gombe State University, Gombe – Nigeria and PhD Candidate,*
*Department of Economics, Ferdowsi University of Mashhad, Mashhad – Iran. E-mail:*
*abdulmaikano85@gmail.com abdullahibuba@gsu.edu.ng; musaabdu87@gmail.com*

*Abstract:* The study examined the impact of monetary policy on Banks' lending in Nigeria. The study covered the periods of fifteen years 2001 to 2015 using quarterly data. The study adopted bound testing approach for co-integration, error correction model developed within an Autoregressive Distributive Lag (ARDL) Model and granger causality test to assess both long-run equilibrium relationship and direction of causality between monetary policy instruments on bank loan and advances. Using the approach, the study found evidence in support of existence of long-run relationship among the variables in the model at 5% level of significance with the exception of real exchange rate that remained insignificance. The study also established the existence of unidirectional causality runs from loan and advances to real exchange rate without feedback at 5% significance level. The result further revealed that, cash reserve requirement and money supply are significance and positive, while monetary policy rate and real exchange rate negatively impacted on loan and advances in the long run. The short run result also indicated that, monetary policy rate, cash reserve requirement and real exchange rate have significance negative influence on loan and advances, while money supply impacted on loan and advances positively. The study recommended that, monetary authority should focus more on monetary policy rate and real exchange rate quality, in order to improve banks lending. Equally, the authority should design optimum interest rate on deposit and loan that will encourage banks lending in Nigeria.

*Keywords:* Monetary policy, Interest Rate, Monetary Authority, Real Exchange Rate, Money Supply, Nigeria

*JEL Classification: E52, E43, E59,* E51

## INTRODUCTION

There is general consensus that banks play a pivotal role in the transmission of monetary policy action in the economy. The achievement of economic growth remains one of the objectives of monetary policy; even though emphasis on techniques and instruments to achieve these objectives had often changed over time, depending on the existing economic situation. In Nigeria and other developing countries the objectives of monetary policy include: full employment of economic resource, financial stability, domestic price stability, adequate economic growth, and external sector stability (Soludo 2014). The supplementary objectives of monetary policy according to Uchendu (1995) include, strengthening the business circle, protection of financial instability and stabilizing the long term interest rate and real exchange rate.

The effectiveness of monetary policy on the economy had for long caught the attention of monetary economists and policy makers (Mansor, 2005). Monetary policy is effective when change in policy rate transmitted to lending rate, which in turn influences aggregate domestic demand, investment, and output (Xu & Chen 2012). As argued by Bernake & Gertler (1995), monetary policy can affect the bank portfolio behavior through the bank assets in terms of loans, securities, and bank reserve.

Therefore, monetary policy and money deposit banks are mutually linked. Olokoye (2011) maintained that, assessment of banking activities particularly in the area of loan and advances can be evaluated through the performance of monetary policy tools. For instance from 2001 to date Nigerian Banks have experienced series of monetary policies, which resulted to fluctuation in the various instruments of monetary policy with the aim for achieving financial stability in the country. In 2014, significant instruments were deployed to achieve price and financial system stability in the form of monetary policy rate, discount rate, open market operation; cash reserve ratio, foreign exchange position and indirect control (Soludo, 2014). In addition to this Olokoye (2011), posited that bank decision to lend out loans is influenced by a lot of factors such as prevailing interest rate, volume of deposit, the level of domestic and foreign investment, bank liquidity ratio and many other factors. Equally Banks reserve is influenced by the central bank through various instrument of monetary policy these instruments include; the cash reserve requirement, liquidity ratio, open market operation and direct control to influence the movement of reserve (Ajie & Nenbe 2010). Thus these entire instruments are manipulated to influence the bank activities and availability of loanable funds.

In Nigeria banking system particularly Deposit Money Banks (DMBs), was came into being in the late 19th century, it creation was influenced by colonial master to provide a safe haven for keeping cash and distribution of credit in case of needs. The DMBs was reinstated by the Central bank of Nigeria in 2001, when the Universal Banking Policy was introduced, to eradicate the dichotomy of operating barrier that exists between commercial banks and merchant banks. The policy by implications merged commercial banks and merchants' bank together to be called Deposit Money banks (DMBs).

Thus, in an emerging economy such as Nigeria's, banking industry plays a pivotal role, as banks create money in the economy by lending loan to various sectors of the economy. Therefore, bank is one of the agents of capital formation. Bank according to Jeucken (1999) receive money and distribute it into various productive and demanding sectors through mobilizing people and economic agents who are reluctant to deposit their excess fund by offering attractive deposit rates.

A good economic system of any country is therefore highly dependent on a sound financial system. No good financial system can do without well-structured and efficient financial institutions especially the banking industry. Khan & Mukharanjee, (2001) opined that poor performance of these financial institutions do not only affect the economic growth and financial structure of a particular country, but also affect the entire world. By and large, an effective monetary policy is required to checkmate the activities of banks, consequent upon the vital role of intermediation played by banks; the banking sector is highly regulated by the regulatory agencies. It is based on this reason that in 2005 deposit money banks were reformed to offer a wide range of changes in financial services. This required that the minimum capital share of Nigerian Banks be raise to twenty five billion, (¦ 25b) Naira. This resulted to several mergers and acquisitions, as bank struggled to meet the capital requirement, which had reduced the number of banks operating in Nigeria to twenty four from eighty nine.

Thus, for effective regulation, monetary policy is used by the government as its instrument to regulate the affairs of the banking services. The instrument which could be regarded as monetary indicators, serve as mediation machinery between the surplus and the deficit sectors of the economy respectively. Therefore, the efficiency of the bank's performance and ability to make, and issue loans, and advances is the function of how the policy designed by the regulatory body, (Central Bank like in the case of Nigeria), affect these Banks. This is because at any moment in time these policies change, the banks operation may consequently be affected. It will also affect their performance. It is in view of this; this work intends to analyze the impact of monetary policy on banks' lending in Nigeria, with reference to deposit money banks DMBs and the effect of monetary policy on their lending activities.

It is understood that, there has been quite a number of achievements recorded by the Central Bank of Nigeria towards resolving the identified structural imbalances in banking operation (Akinne, 1986). These achievements were made from a number of experiences in the Nigerian banking reforms, related to monetary policy.

Nigerians have witnesses six major reforms since 1892 as identified by Udende (2009) noted as follows; free banking era (1892 - 1951), Regulatory Era (1952 - 1991), Liberalize Regulatory Era with Special Role (1991 - 2000), Liberalize Regulation with Universal Role (2000-2005), Regimented Regulation / consolidation policy (2005 - 2009), Regimented Regulation/ Ownership Solution (2009 to date). But there is no policy without its short coming, as agued by Segun (2009) and CBN (2009) that Universal banking has undoubtedly

assisted the monetary policy's transmission mechanism in the banking sector but Segum was of the opinion that, universal banking was the main factor responsible for the 2009 banking crisis in Nigeria,

However, there are many other studies that are related to this study in relation to monetary policy and banking lending in Nigeria. But the studies that are devoted to evaluate the effect of monetary policy on bank lending were relatively few, not only restricted here but the result obtained differed from one to another, the methodology used, scope, data as well as variables used in the models, see (Omorokunwa & Adegboye 2011; John & Nwachukwu 2017; Amidu & Wolf (2008) Otalu, Oladesaumi & Okapo, (2004), Alex (2005) and Felicia (2011) to mention but a few. But their study are not without limitations, the main disadvantages associated with the studies include the application of bivariate model which suffered from the omission of variables bias, simple correlation, and regression analysis which cannot be able to account for detailed dynamic time series properties like test of unit root stationarity, cointegration and causal relationship among variables of interest. See, Okoye & Eze (2013), Alex (2005),Victor & Eze (2014)

To cover this gaps this work would study the period when universal banking policy was introduce, adopted a modified Autoregressive distributed lag model (ARDL Model), to analyze the impact of monetary policy on bank lending in Nigeria with particular reference to deposit money banks. ARDL Model provide opportunity to employ data with a mixture of stationary and non stationary time series, it is capable in measuring both short run and long run parameters of the model respectively, (Pesaran, Shin & Smith 2001). It is against the aforementioned backdrop this study seeks to narrow these gaps and answer the following questions:

i)   To what extent do monetary policy instruments affect bank lending in Nigeria?

ii)  Is there any long-run relationship between Monetary Policy instruments and bank lending in Nigeria?

iii) What are the directions of causality between Monetary Policy instruments and bank lending in Nigeria?

## THEORETICAL FRAMEWORK

The study adopted bank lending channel of monetary transmission mechanism theory as explained by Bernake & Blinder (1988) as its theoretical underpinning. This is in line with the work of Felicia (2011), Alex (2004), Amidu (2004), Okpara (2010) and Otalu, Oladeseumi & Okapo (2004). The theory was chosen because it is more comprehensive in incorporating a greater number of possible factors influencing lending capacity of banks in Nigeria especially monetary policy instruments, which affects the lending behavior of banks in Nigeria.

### Review of Empirical Literature on Bank Lending in Nigeria

Adegboye, Olowe & Uwuigbe, (2013) investigated the return on investment of deposit money banks in Nigeria, from 1977 to 2010. The study introduced three stages of assessment

of deposit money banks characteristics and some macro economics variables, on total credit, investment and commercial banks total lending and deposit rate. He investigated bank efficiency between specific and environmental factors. Using OLS as techniques of data analysis findings revealed that return and profitability of commercial banks is significantly affected by macroeconomic variables. The study recommend that macroeconomic policy are to be deployed to promote low inflation and stable output and also suggested that, government should boost credit expansion to the benefit of the Nigerian economy.

Akanbe & Ajagbe, (2012). analyzed the impact of monetary policy on commercial banks in Nigeria , using a panel data of three commercial banks covering the periods of 1992 to 1999, employed fix effect panel data analysis. The result of the fixed panel shows that increase in interest rate led to a decrease in the lending rate while liquidity ratio and cash ratio were statistically significant. They concluded that non-Bank institution should follow the realm of monetary policy.

Samson & Tarila, (2014) in their study of Money Deposit Bank and Economic growth in Nigeria using Eagle-Grager representation theorem, co-integration regression from OLS Model to ascertain the extent to which pectoral credit allocation by MDBs have influenced growth in the Economy. The findings showed that credit allocation to productive sector is significantly promoting economic activities. The conclusion of their findings is that the banking system should perform its role of credit allocation effectively, it must channel fund into productive investment and more productive uses.

In another study Ogunbiyi & Ihejirika, (2014) analyzed the interest rate and deposit money Bank lending in Nigeria between 1999 and 2010, using multivariate regression analysis, ARDL, Model, The findings revealed that money lending rate, real interest rate; saving deposit have negative and significant impact on bank lending. They concluded that, banks lending depends on the interest rate, thus the government should adopt monetary policy that will help Nigerian Money Deposit Banks improve their lending capacity and there is need to review the banks' lending rate.

Sunday & Thabitha, (2015) adopted fixed panel data to investigate the effects of macroeconomic factors on financial performance of commercial banks in Nigeria, where bank loan and advance was used as proxy to measure the performance. The findings showed that, Unemployment rates, exchange rates and real interest rates has negative significant association with loan and advance, also real exchange rate interest rates have positive insignificant association while inflation has insignificant negative influence on loans and advances. The study suggests that, commercial banks operating in Nigeria should provides strategies that aim at adjusting their lending rates and financial activities to automatically balance the rate of real interest rate. They further maintain that the bank should be aware of changes in exchange rate and interest rate so as to adjust their rate accordingly since an increase in interest rate worsen the performance and decreases better the performance.

Furthermore, Jegede, (2014) Examined the effect of monetary policy on commercial bank's lending in Nigeria. From econometric estimation method Vector auto-correlation

mechanism of ordinary least square techniques, the study covered the period from 1998 to 2008. Findings revealed that, there is a long-run relationship among the variables in the model. Specifically, the findings also revealed that exchange rate and interest rate have significance influenced on commercial banks lending, while money supply and liquidity ratio have negative impact on commercial banks loans and advances. The study concluded that monetary policy instrument are not effective to stimulate commercial banks loan and advances in the long run, while banks credit is more responsive to cash reserve ratio. Therefore, monetary authority should make efforts to develop indirect monetary instrument and exercise appropriate control over the monetary sector.

Somoye & Iio (2009) analyzed the impact of macroeconomic instability on the banking sector lending behaviors in Nigeria from 1986 to 2005. Their study shows that mechanism of transmission of monetary policy stock to banks operations. The co-integration and vector error correction provides a long-run relationship between bank lending and macro-economic instability.

Ajayi & Atanda, (2012) investigated the effect of monetary policy instruments on banks performance to determine the existence of long-run relation between 1978 and 2008. Using Engle-granger two step co integration approaches, The empirical estimated result indicated that bank rate, inflation rate and exchange rate enhances banks performance, while liquidity ratio and cash reserves ratio exert negative effect on banks total credit. Although, it is only cash reserve ratio and exchange rate that were found to be significant. He concluded that monetary policy instruments are not effective to stimulate credit in the long-run; while banks total credit is having effective impact on cash reserve ratio. By implication he maintained that, monetary authority should moderate the minimum policy rate as a tool for regulating commercial banks operations and facilitating investment in the economy.

Omorokunwa & Adegboye (2011), Using OLS techniques to Study the habit of monetary policy on bank lending habit, covering the periods between 1980 to 2009, the co integration and error correction techniques revealed that monetary policy and bank loans and advances have significant impact particularly in the short run, the findings suggests that banks in Nigeria should take a long run perspective of monetary policy.

John & Nwachukwu (2017) examined the impact of monetary policy and credit delivery in commercial banks in Nigeria the study used OLS as a technique of data analysis, covering findings over a sample period of 35 years from 1980 to 2015. The variable considered include: cash reserve requirement, liquidity ratio, monetary policy rate, money supply and loan and advances. The finding revealed significant association between monetary policy and loan and advances in the long run, the finding suggest that, central bank should carefully and thoroughly consider the turn over effects in deciding liquidity reserve ratio.

In another study Okoye & Eze (2013) who studied the impact of bank's lending rate on the performance of Nigerian deposit money bank between 2002 to 2010 they specifically determined the effect of lending rates and monetary policy rates on performance of Nigerian

deposit money bank and analyzed how bank lending rate and monetary policy affects the performance of deposit money bank. The study found a significant positive relationship between banks lending rate and monetary policy in the deposit money banks in Nigeria.

Alex (2005) examined the effects of monetary policy on money deposit banks in Nigeria, using OLS model. The study considered bank lending rates as a dependant variable, monetary policy rate, Liquidity Ratio, Cash Reserve Ratio and Average Exchange Rates as independent variables, the study spannen from 1985 to 2008 the result showed that monetary policy rate revealed significant effects on bank loans and advances. Thus conclude that, Central Bank should create policy procedure and analytical capabilities which should be entrenched in credit management.

Sanusi (2010) used structural vector auto-regression (SVAR) model to examine interest rate efficiency of monetary policy in Nigeria, the study cover the periods from 2002 to 2010. The work was expanded to determine the distortion on the retail loan and deposit market on monetary policy. The outcome showed that retail lending and deposit rates are insignificant. It recommends that central banks should do all their possible to remove the distortions in order to make monetary policy effective.

Otalu, Oladesaumi & Okapo, (2004) examined credit creation from monetary policy on the commercial banks performance in Nigeria;. Using OLS econometric model, monetary policy instrument; interest rate and cash reserve ratio were used as independent variables and bank credit as dependant variable. Results from the findings revealed that credit creation has positive impact on commercial banks performance, but money supply, cash reserve ratio, have much more impact on credit creation of commercial banks. The study recommended that a vibrant monetary policy be promulgated that will be effective in controlling the credit creation power of commercial banks in Nigeria.

Felicia (2011) in another dimension analyzed the determinant of commercial banks lending behavior in Nigeria, she examined the effectiveness and the common determinant of commercial banks lending behavior and how it will affect the lending behavior of the commercial bank in Nigeria the model captured the secondary data of a total population of 89 bank in Nigeria, to estimate commercial banks loans Advances and other variables such as the total deposit, Instruments portfolio, lending rate, Stipulated cash reserve ratio and the liquidity ratio. Covering the period of 1980 to 2005, The model estimated through OLS techniques hypothesis that, there is functional relationship between the dependant variable loans and advances and independent variables, total deposit, lending rate cash reserve ratio, and liquidity ratio. she recommended that, commercial banks should focus on mobilizing more deposit as it will enhance their lending performance by formulating a concrete, realistic and comprehensive device and financial plan.

Omakharintan, Okorie and Taiwo, (2015) examined the effects of monetary policy on loan risk exposure in Nigerian commercial banks. The study adopted vector error correlation model (VECM) frame work, as techniques of data analysis. The findings revealed that, lending rate does not play a significant role in support of loans and advances. This indicates

that monetary policy rate is the competent parameter in determining the performance of banks in the allocation of their credit facilities. Base on their findings the study decide that monetary intermediaries should give opportunity for the full interplay of the market forces to determine the allocation of credit with close supervision to prevent banks by creating artificial scarcity of fund in order to link their lending rate.

John & Nwachkwu (2017) examined the monetary policy and credit delivery in Nigeria commercial banks. The study used ordinary least square model, the findings showed that monetary policy rate, money supply and cash requirement reserve positively related loan and advances while liquidity ratio has negative relationship. The study therefore maintained that monetary policy instrument can work better if all variables can effectively work together as instruments of bank regulation and finally suggested that, cash reserve requirement should complement open market operation to ensure excess liquidity to supply loan in the economy.

Olokoye (2011) examined the determinant of commercial bank's lending behavior in Nigeria using ordinary least square estimation as method of data analysis. The result of the findings revealed that banks deposits have greatly impacted on the banks' lending and recommend that commercial banks should focus more on mobilizing deposits and formulating qualitative financial plan.

## Review of Empirical Literature on Bank Lending in other Countries

In a study carried out by Gambacorta & Lanni (2005) which examined the velocity and asymmetry in banks response to interest rates to monetary policy shock. The study covered 1985 to 2001 using Asymmetric Vector Correlation Model (AVECM) that allows for different behavior in both the short run and the long run. The study revealed that the speed of adjustment of banks interest rate to monetary policy is positive but negative shock is asymmetric in the short run with the believed that in the long run the equilibrium is quite different. Their finding also showed that the banks adjust their loan price faster during the contractionary monetary policy.

In india Kayshab & Stein (1995) studied the bank's business lending respond to monetary policy tightening. The study covered a period between 1960 and 1980 and using error correction model. They found that policy tightened has negative impact in both total loan and business loan on small banks. But it does not affect loan at large banks. This variation according to them is an indication of insufficient fund in the small banks than in the large banks. They suggests that, government should provide measures that more fund will be injected to improve their ability to provide loan to businesses.

Younus & Akhtar (2006) examined the significance of statutory liquidity requirement as a monetary policy instruments in Bangladesh. Using descriptive statistical technique of data analysis, the findings revealed that statutory liquidity requirement has experience frequent change he found that statutory liquidity requirement has experience constant changes and previous evidence indicate that fall in statutory requirement has positive impact

on bank credit. The study suggests that, open market operation should be use constantly rather than the change in the banks rate and statutory liquidity rate as instrument of monetary policy.

In another study by Cloudio & Leonardo (2017) who examined monetary policy and bank lending in low interest rate environment: diminishing effectiveness. Sampling 108 international banks covering the period of 2010 to 2014 the study adopted GMM econometric model for data analysis. the finding shows that, low interest rates on banks' lending lower the performance of banks and suggest that, reduction on short term interest rate are less effective in stimulating banks lending growth.

Christophe, Anne & William (2017) studied the unconventional monetary policy and bank lending relationship in France firm in 2012. The studied revealed the reduction in credit cases increases in eligibility to firms on banks debts and reduces both default on their suppliers and relegates their credit ratings. The findings dogged out that banking relationship support additional lendings during the credit crunch, therefore, it maintained that a single banking firm was substantially more credit constrained than multi-Bank firms.

Stefen & Galina (2018) studied U.S. Monetary policy and fluctuation of international bank lending using GMM econometric model. The finding proved that banks lending from advance emerging economy to emerging economy is positive while in contrast the study also discover that during the stagnant growth in bank lending from advance economy and the relation between the federal fund and banks lending is negative. the study thus suggested that, these two situation federal funds rate should impact on US monetary policy on cross border bank lending flow to any country or region and be much more predictable.

Morris & Sellon (1995) examined the bank lending and monetary policy in US. the study employed asymmetric error correction model, the study's findings discovered bank portfolio behavior is more susceptible to bank's lending, the study also showed that decline in deposit in each period of time of policy tightening as interest rate increases. Thus the study suggested that bank should do away with loss of deposits by selling securities and obtaining additional money to maintain their loan demand.

Loupias, Savignac & Sevistri (2001) who examine the monetary policy and banks lending in France, using error correction model as tool of analysis. Found out that, an increase in interest rate led to a long run decrease by 1.5 to 2 percent decrease in the outstanding amount to be lent as loan by the average banks. The study thus suggested that, monetary agencies should decide interest rate in such a way that will not affect loan performance of the banks.

Odufalu (1994) examined the impact of monetary policy on bank loan and developed a model of bank loan and advances as dependant variable while cash requirement ratio, money supply, total deposit, lending rate minimum rediscount rate and treasury bill as independent variables He used pooled data from only twelve commercial banks from the period of 1986 to 1990 and estimated models using ordinary least square estimation method.

The findings showed that, cash requirement reserve, money supply, lending rate are positive and significance with loan and advances, while on the other hand bank deposit and treasury bill are negative with bank loans and advances.

Aban (2013) examined the presence of banks lending from monetary transmission lending channel in Philippines, he used quarterly data from 2008 to 2011 of 35 commercial banks to ascertain the effect of loan growth on monetary policy shocks. Ordinary least square model was uses as tool of analysis. The result showed that the bank size, characteristic influenced lending channel. He therefore recommended that small banks loan should be grow more sensitively to change monetary policy.

Lourencia (2018) investigated the effects of monetary policy rates on commercial banks lending. The study intended in ascertaining the short run and long run relationship between the variables of interest cover the period from 2002 to 2017. The work employed VAR as estimation statistical model of data analysis. The study found significant relationship among bank lending and monetary policy rate equally it was significant both in the long and the short run while on the order hand money supply is negative to lending. Base on the finding the study suggest that appropriate measures should be observe to aid development in the financial market.

Amidu (2004) investigated the link between monetary policy and banks lending behaviors in Ghana, using panel cross sectional data for the periods from 1998 to 2004, the study discovered that the Ghanian bank's lending behavior were affected significantly by change in money supply, also size of the bank and monetary policy rate significantly influenced ability of bank to extend credit. He therefore made the suggestion that, it will be good to evaluate other bank level.

Motemilda, Banny-Ariffin & Muhtar (2014) examined the impact of monetary policy on banks lending rate in South-Africa. The study investigated the long run interest rate in the money market rate to the bank lending rate, the study applied the momentum thrash hold autoregressive and asymmetric error correction model. The findings showed that bank's lending rate adjust to decrease in the money market rate and suggested that commercial bank's should adjust their lending rate to support the customer's reactions.

Gupta (2008) studied the impact of monetary policy decisions on real economy in Pakistan and India. He maintained that contractionary monetary policies had significant impact on bank's lending. The study deployed vector autoregressive VAR model as tool of analysis of time series data. the finding suggested that. Measures should be put place to improve the policy to avoid future problems associated to bank's lending in the economies.

In another study on Islamic banking and credit channel of monetary policy by Abdul-Rafay & Saqib (2019) which covered the periods of 2007 to 2017 using coitegration test and vector autoregressive variance decomposition techniques the result revealed the significant role of Islamic banking in transmitting monetary policy decisions, equally investigations demonstrated active bank lending channels of Islamic banking in Pakistan.

The finding suggests that Islamic banking should have the same functional role as compared to its conventional counterpart.

Acheampong (2005) performed the econometric analysis on interest rate channels of monetary policy transmission mechanism. Used dummy variables to capture the effect of changes in money market on bank lending the result of error correction model shows that long run effect cut across money market to lending rate significantly deposit rate behaved in same manner. The findings concluded that Treasury bill in Ghana is more of fiscal policy instrument than monetary tool.

## METHOD OF DATA COLLECTION

The study used secondary data sourced from central bank of Nigeria. Specifically quarterly time series of some monetary policy indicators for the periods 2001 to 2015 were used. The variables include; loans and advances, monetary policy rates, cash reserve requirements, money supply, and exchange rate. The data was sourced and obtained from the website of Central Bank of Nigeria.

The study covered a period of fifteen years quarterly time series data spanning between, January 2001 to December 2015. This gives a total of sixty (60) observations. The sample size chosen has been considered adequate to give a confident interval of required width. this is in line with the central limit theorem of thirty minimum observations. Non probability sampling techniques was used to source the data.

## MODEL SPECIFICATION

This study adopts and modifies the model of Shahateet (2014). Equation (1) is the functional form of the model:

$$LANDA_t = f(CRR_t, MPR_t, MS_t, REXR_t) \qquad (1)$$

Specifying equation 1 in it structural form given equation 2

$$LANDA_t = \beta_o + \beta_1 CRR_t + \beta_2 MPR_t + \beta_3 MS_t + \beta_4 REXR_t + \mu_t \qquad (2)$$

Where

LANDA　　　　= Loan and Advance (Dependant Variables)

$\beta_0$　　　　　= Constant Parameter

$\beta_1 - \beta_6$　　　　= Coefficient of Dependant variables

$CRR_t$　　　　= Cash Requirement Ratio

$MPR_t$　　　　= Monetary Policy Rate

$MS_t$　　　　= Broad Money Supply

$REXR_t$　　　　= Exchange rate

$\mu_t$　　　　　= Error term

## Techniques of Data Analysis

That, time series data is notably non-stationary due to frequent changes in time trend, in lieu of this reason, the study employed Augmented Dicker Fuller (ADF) and Phillips-Perron's (PP) test of stationary to investigate the unit root. This is to find out whether the series employed are stationary or otherwise. In order to determine the impact of monetary policy on bank lending performance, the study used Autoregressive Distributed Lag, (ARDL) Model as developed by Pesaran, Shin, & Smith, (2001). The model is a robust econometric technique for estimating the level of relationship between dependant variable and series of independent variables that may not necessarily be integrated in the same order, the model provides consistent estimation in the presence of a mixture of stationary and non-stationary series, (Pesaran *et al* 2001), and thereby making pre-test for unit root test becomes unnecessary.

ARDL differentiates between dependant and independent variables and allows testing for the long-run relationship between them, and allows different variables with different numbers of lags. Finally, ARDL, model is not only suitable for estimating small and large sample size but is also capable of estimating both short-Run and Long-run parameters of the model simultaneously (Pesaran *et al*, 2001).

## Autoregressive Distributed Lag Bound Testing Approach

The ARDL approach to co-integration analysis involves estimation of unrestricted Error Correction Model (UECM). Hence the ARDL model for testing the relationship between bank performances and determining monetary policy instrument will be stated as shown below;

$$\Delta \begin{bmatrix} LANDA \\ CRR \\ MPR \\ MS \\ REXR \end{bmatrix}_t = \begin{bmatrix} \delta_1 \\ \delta_2 \\ \delta_3 \\ \delta_4 \\ \delta_5 \end{bmatrix} + \sum_{t-1}^{m} \begin{bmatrix} \varphi_1 \\ \varphi_2 \\ \varphi_3 \\ \varphi_4 \\ \varphi_{56} \end{bmatrix} \Delta \begin{bmatrix} LANDA \\ CRR \\ MPR \\ MS \\ REXR \end{bmatrix}_{t-i} + \begin{bmatrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{bmatrix} \Delta \begin{bmatrix} LANDA \\ CRR \\ MPR \\ MS \\ REXR \end{bmatrix}_{t-i} + \begin{bmatrix} \mu_1 \\ \mu_2 \\ \mu_3 \\ \mu_4 \\ \mu_5 \end{bmatrix}_t \qquad (3)$$

where *m* is the optimum lag length which will be determining using Akaike Information Criteria (AIC) and Schwartz Information Cretaria (SIC), $\Delta$ is a difference operator, $\delta_k$ (k = 1,2,3,4,6) represents the constant parameter of the matrix, $\varphi_k$ in the matrix represents the coefficient of level lagged value of the explanatory variables captured in the model, while $\beta_k$ is a vector of the coefficients of the first difference lagged value of the variables captured in the model.

According to the above, bound testing for the presence of long run relationship will be conducted with the use of *F-test* which tests the null hypothesis that states that there is no

co-integration among the variable as against the alternative hypothesis. Given the mixture of the order of integration of the variables, there are two sets of critical values for the decision rule, each assuming polar case of all variables being 1(0) or 1(1) (Pesaran *et al* 2001).

Therefore, after computation, if the capture F-Statistics falls outside (above) the critical value bound, the decision rule will reject the null hypothesis of no long run relationship. But if at falls within the critical bound, the null hypotheses is neither rejected nor accepted. It will be term as inconclusive and will requires further investigation on the correct order of integration of the variables under consideration for any valid inferences to be drawn (Peseran *et al* 2001).

## Causality Test

The Granger causality test is administered in form of Vector Autoregressive (VAR) Approach to indicate short run behavior or direction of causality between series on the condition that there exit's long run relationship in Johenson's co-integration test. If traced statistics is less than critical values, it implies no long rung relationship then we seek for Granger causality for short run relationship. The causality test is reported in different approach; for instance when causality runs from LAND to EC meaning that LANDA Granger cause EC, it could also be the case where EC Granger cause LANDA when causality from EC to LANDA. The reverse may be the case, on the contrary when LANDA and EC may cause each other.

$$LANDA_t = \sigma + \sum_{i=1}^{k}\varphi_1 LANDA_{t-1} + \sum_{i=k+1}^{d}\varphi_2 LANDA_{t-1} + \sum_{i=1}^{k}\alpha_1 EC_{t-1} + \sum_{i=1}^{d}\alpha_2 EC_{t-1} + \varepsilon_{2t}$$

(6)

$$EC_t = \beta + \sum_{i=1}^{k}\delta_1 EC_{t-1} + \sum_{i=k+1}^{d}\delta_2 EC_{t-1} + \sum_{i=1}^{k}\lambda_1 LANDA_{t-1} + \sum_{i=1}^{d}\lambda_2 LANDA_{t-1} + \mu_{2t} \quad (7)$$

Where:

$\sigma$ and $\beta$ = constant parameters

$\varphi$ = vector of the parameters of the lagged values of the natural logarithms value of LANDA

$\delta$ = vector of the parameters of the lagged values of the natural logarithms value of EC

$\delta$ = vector of the parameters of the lagged values of the natural logarithms value of EC

$\lambda$ = vector of the parameters of the lagged values of the natural logarithms v alue LANDA

$\varepsilon_t$ and $\mu_t$ = error terms.

## Stability Test

The final test is the stability test of the model to establish cointigration among variables. This test is necessary but not sufficiently conditioned. Since the study employed the use of

stability test designed by Brown 1975, known as Cumulative Sum of the residual (CUSUM) and Cumulative Sum of the Square (CUSUMQ) if the graph of CUSUM and CUSUMQ is within the critical bound region 5% level of significance the null hypothesis is that, the entire coefficient in the model should not be rejected.

## POST ESTIMATION TEST

### Diagnostic Test

Diagnostic test for serial correlation, hetroskedasticity, normality and Ramsey reset test were carried out for the estimated model.

### Breusch Godfrey LM Test for Autocorrelation

Aucorrelation is the relationship between current and past error terms and this is most likely to occur in time series data. Compared to DW Test and Durbin's h test, we chose the Breusch Godfrey LM Test because the DW test will provide inconclusive results and does not take higher order of serials correlation into account and the Durbin h test is unable to use the lagged dependant variable. In the test, there is no autocorrelational problem for null hypothesis; the null hypothesis will be rejected if the P-value of F-statistic is lower than the level of significance.

### Breusch Godfrey Hetroscedasticity Test

To ensure that all the residual are randomly scattered throughout the range of the dependant variable, heteroscedasticity test will be used. These variance of the error would be expected to be constant for the value of the controlled variables, in the presence of heteroscedasticity, the disturbances of the parameters are no longer normal. The decision rule is to reject the null hypothesis if the probability of the F-statistic and observer $R^2$ are less than 0.05, meaning heteroscedasticity is present on the other hand if the probability of the F-statistic and observer $R^2$ is greater than 0.05 we do not reject the null hypothesis. This indicates there is no heteroscedasticity. That is errors are homoscedastic.

### Jarquee-Bera (JB) Test for Normality

Jarquer-Bera this test is employed to find out whether the null hypothesis of error terms is normally distributed; the null hypothesis will be rejected if the P-value of the JB statistic is lower than the level of significance.

## DESCRIPTIVE ANALYSIS

Descriptive statistics reports the nature and pattern of distribution of each variable in the models, and this is reported in table 1.

**Table 1: Summary Statistic**

|  | LANDA | CRR | MPR | MS | REXR |
|---|---|---|---|---|---|
| **Mean** | 5690.394 | 857.4054 | 11.91929 | 8815.496 | 102.7032 |
| **Median** | 6511.641 | 143.0754 | 12.08500 | 8709.658 | 92.86967 |
| **Maximum** | 12111.98 | 3667.200 | 19.33000 | 18901.30 | 155.7536 |
| **Minimum** | 875.1361 | 84.07080 | 6.080000 | 1505.964 | 69.94124 |
| **Std. Dev.** | 3718.840 | 1186.455 | 3.404924 | 5943.310 | 28.45715 |
| **Skewness** | 0.128060 | 1.346320 | 0.290101 | 0.256150 | 0.708371 |
| **Kurtosis** | 1.730640 | 3.319630 | 2.801616 | 1.679686 | 2.076843 |
| **Probability** | 0.141373 | 0.000188 | 0.644903 | 0.096331 | 0.035581 |
| **Sum Sq. Dev.** | 7.61E+08 | 77422138 | 637.6428 | 1.94E+09 | 44539.51 |
| **Observations** | 56 | 56 | 56 | 56 | 56 |

*Source:* Authors' computation using EViews 9

Table 1 suggests that the mean, medium, minimum and maximum values of LANDA are ¦ 5656.58, ¦ 6511.641 and ¦ 12111.98, ¦ 875.14 million respectively. This indicates the average, and the maximum and minimum volume of lending that DMBs can distribute in every quarter of the year from 2001 to 2015. Table 1 suggests that the mean, medium, minimum and maximum values of CRR are ¦ 857.41, ¦ 143.08, ¦ 84.07 and ¦ 3667.20 million respectively. Also, the mean, medium, minimum and maximum values of MPR are 11.92, 12.09, 6.08 and 29.33 percent respectively. It is again reported in table 4.1 that the mean, medium, minimum and maximum values of MS stands at are ¦ 8815.50, the average money supply granted for loan by DMBs ¦ 8709.66, ¦ 1505.96 and ¦ 18901.20 million minimum and maximum volume supply to DMBs correspondingly. The table indicates further that the mean, medium, minimum and maximum values of REXR are estimated at ¦ 102.70, ¦ 92.869, ¦ 155.75 and ¦ 69.941 million respectively. Table 4.1 signifies that all the variables are positively skewed given their positive skewness values.

The table indicates that the tails of CRR, is heavy because it's respective Kurtosis values is greater than three. In other words, the variables are said to have lepto-kurtic curve. However, the tails of LANDA, MPR, REXR and MS are light or have a platy-kurtic curve because their respective Kurtosis values are less than three. Jarque-Bera results show that data on CRR, MS, and REXR are not normally distributed since the probability values of their Jarque-Bera results is less than either 1, 5 or 10 percent levels of significance while data on LANDA and MPR is normally distributed since the probability values of their Jarque-Bera are greater than all levels of significance.

## INTERPRETATION OF ESTIMATED RESULTS

### Stationarity Test

Given that time series data is known to be associated with random shocks, stationary test was conducted to detect the presence or otherwise of unit root in each of the variables.

Table 2 presents the results of both Augmented Dickey Fuller and Phillip Peron unit root tests.

**Table 2: Unit Root Test**

| | | ADF Test | | PP Test | |
|---|---|---|---|---|---|
| Variables | Level | 1$^{st}$ Diff | | Level | 1$^{st}$ Diff |
| **Loan and Advances** | -3.292*** | -----_____ | | -2.597 | -8.442*** |
| **Cash Requirement Ratio** | -0.774 | -1.996 | | -0.223 | -10.96*** |
| **Monetary Policy Rate** | -1.429 | -7.819*** | | -1.305 | -7.957*** |
| **Money Supply** | -2.913 | -1.478 | | -2.760 | -11.06*** |
| **Exchange Rate** | -1.348 | -7.672*** | | -2.091 | -7.674*** |

*Source:* Authors' Computation using Eview 9

Significance level ***=1%, Significance level **=5%, Significance level *=10%

In table 2, ADF statistics shows that LANDA has unit root and is stationary at the level, while CRR and MS have unit roots at level and first difference but they are stationary at second difference. It is shown in the table that while REXR, and MPR, are stationary at first difference based on ADF statistics. Conversely, Phillip-Peron statistics reports that LANDA, CRR, MPR, MS, and EXHR are stationary at first difference at 1 percent level of significance. Given that Phillip-Peron test is a generalization of ADF test that takes into consideration the fair and mild assumptions concerning the distribution of errors; Phillip-Peron test is thus superior to ADF test (Phillip and Peron, 1988). In this light, the study goes with the Phillip-Peron results. Despite the fact that it has allowed a mixture of orders of integration: I(1) and I(0).

**Table 3: Lag Order Selection Criteria**

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -1626.401 | NA | 1.22e+21 | 62.74618 | 62.93380 | 62.81811 |
| 1 | -1349.586 | 489.7500 | 7.66e+16 | 53.06098 | 54.18670* | 53.49256 |
| 2 | -1342.591 | 11.03064 | 1.57e+17 | 53.75348 | 55.81730 | 54.54470 |
| 3 | -1327.709 | 20.60530 | 2.49e+17 | 54.14265 | 57.14456 | 55.29351 |
| 4 | -1245.598 | 97.90183* | 3.19e+16* | 51.94607* | 55.88608 | 53.45657* |

* indicates lag order selected by the criterion

LR: sequential modified LR test statistic (each test at 5% level)

FPE: Final prediction error

AIC: Akaike information criterion

SC: Schwarz information criterion

HQ: Hannan-Quinn information criterion

*Source:* Authors' computation using EVIWS 9

Table 3 present the lag order selection criteria as it is provided on the table Schwarz information selecting a minimum lag of 1 while Akaike information criterion selecting 4 as well as final prediction error. Thus for this work, the Akaike information criterion that selected the optimum lag will be accepted.

## Autoregressive Distributive Lag (ARDL) Models

Phillip-Peron test suggests that there is no combination of orders of integration among the variables, which implies a good condition for ARDL models. Thus, the next step is to estimate Bound test so as to detect the presence of long-run relationship among the variables in the models.

The results of bound testing are reported in table 3 and the table shows the presence of long-run relationship in the first model in which LANDA is the dependent variable. This is because the F-Statistic of the P-Value is greater than both the upper and the lower bound at 1 per cent

**Table 4: Bound Testing Result**

| Dependant variable | Funtion | | F-Statistic |
|---|---|---|---|
| LANDA | $F_{LANDA}$(LAND, CRR, MPR, MS, REXR,) | | 5.255587*** |
| CRR | $F_{CRR}$(CRR, MPR, LANDA, MS, REGQLTY) | | 8.300186*** |
| MPR | $F_{MPR}$(MPR, MS, MPR, LANDA, REXR,) | | 8.510540*** |
| MS | $F_{MS}$(MS,LANDA, CRR, REXR, MPR,) | | 8.430261*** |
| REXR | $F_{REXR}$(REXR, CRR, MS, MPR, LANDA) | | 1.228858*** |
| Asymptotic critical value | 10% | 5% | 1% |
| Lower bound | 2.2 | 2.56 | 3.29 |
| Upper bound | 3.09 | 3.49 | 4.37 |

*Source:* Authors' Computation using Eview 9
Significance level ***=1%, Significance level **=5%, Significance level *=10%

The other result suggests that the variables in the model is also cointegrated at 1 percent level of significance since F-statistic of each of the models is greater than both

**Table 5: Long-run Result of Impact of Monetary Policy on Bank Lending**
**ARDL (4,4,1,0,0,1) Selected Base on Akaike Information Creterion**

| | Independent Variables | | | | |
|---|---|---|---|---|---|
| | Constant | CRR | MPR | MS | REXR |
| Dependant Variable: LANDA | 5201.301 [2168.042] | 0.8468*** [0.3172] | -211.041*** [82.5325] | 0.4366*** [0.1032] | -14.889*** [6..524] |

*Source:* Authors' Computation using Eviews 9
Standard error [], *Significance level ***=1%, Significance level **=5%*
*Significance level *=10%*

upper and lower bound values at 1 per cent except the fifth model, in this case the null hypothesis will be rejected that there is no long run relationship.

Table 4 the result of co-itegration equaton in the model shows the long run coefficient value of CRR, MPR, MS and REXR based on the result, the coefficient value of CRR and MS have positive significant long-run effect on LANDA. That is 1% increase in CRR and MS will increase the supply of money and bank requirement rate in the volt of the DMBs by 0.85% and 0.44% respectively. Results of MPR and REXR carried negative value. However CRR, MPR, MS and REXR are significant at 5 percent respectively.

**Table 6: Error Correction Model**
**ARDL (4, 4, 1, 0, 0, 1)**

| Variable | Coefficients |
|---|---|
| LANDA | 0.341392[0.112] ** |
| CRR | -0.117642[0.4812] ** |
| MPR | -345.564427[71.603] ** |
| MS | 0.433123[0.1303] ** |
| REXR | -25.260838[7.5240] ** |
| $ECT_{t-1}$ | -0.700231[0.154085] ** |
| Adjusted-$R^2$ | 0.68 |
| DW | 2.60 |
| Diagonestic Test | |
| F-Value | 6.72** |
| FBeusch-Godfrey LM | 0.456292(0.6371) |
| FBeusch-Pagan-Godfrey Het | 1.503027(0.1461) |
| Jarque-Bera-Normality | 0.254283(0.880609) |
| Ramsey-Reset | 2.240845(0.5308) |

*Source:* Authors' Computation Eview 9

Standard error [], Probability value (), *Significance level ***=1%,*

*Significance level** =5%, Significance level *=10%*

Table 5 presents short run relationship, error correctional model and diagnostic tests of the first model reported in table 4.3. Table 4.5 reports that LANDA has positive significance effect against itself; equally the coefficient value of MS is positive and significantly impacts on LANDA at 5% percent. As for CRR, MPR and RXER all have negative significant effects on the LANDA at 5%.significance level.

However, the ECM test shows that ($R^2$) is 80 percent implying a fairly fitted relationship between the variables and loan and advances. The adjustment $R^2$ approximating 68 percent indicating that the speed of adjustment to equilibrium after deviation is 68% in the previous quarter to current one. the error correction coefficient of -0.700231 has the right sign (nagative) and show that 68 percent deviation from equilibrium is corrected quarterly also F – Statistic with probability value of 0.0009 is significance at 5 percent confidence level.

F-statistic of Breusch-Godfrey LM test shows that there is no second-order serial correlation since the P-value of the test is greater than all levels of significance as evidenced by DW statistics of 2.60. Similarly, the F-statistics of Breusch-Pagan-Godfrey test shows that the model is not heteroskedastic meaning it is homoskedastic because its P-value is greater than all levels of significance. However, Jarque-Bera normality test shows that the model is normally distributed its P-value is greater than all the levels of significance. The model passes Ramsey Reset test meaning it is correctly specified.
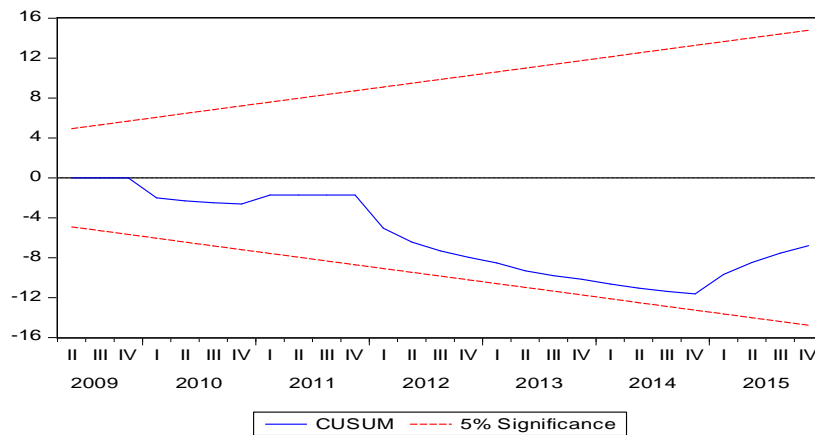


**Figure 1: Cumulative Sum of Residual**

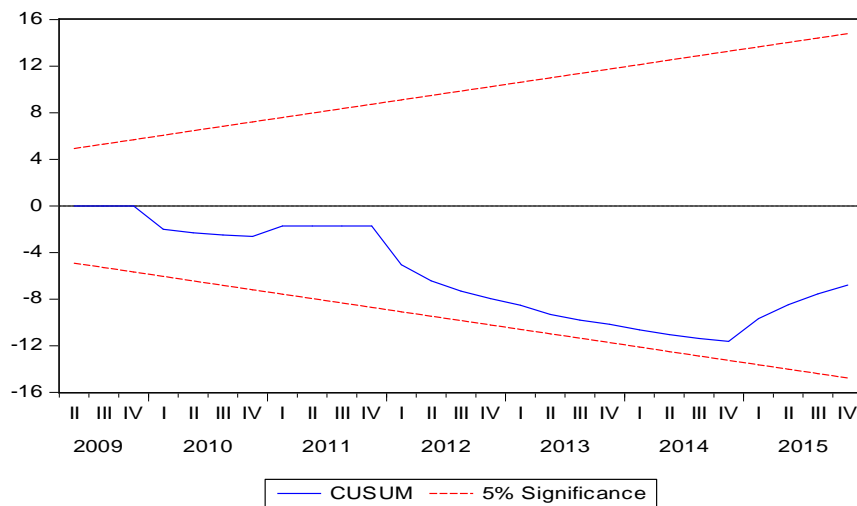*Source:* Author's Computation using Eviews 9



**Figure 2: Cumulative Sum of Squares**

*Source:* Author's Computation using Eviews 9

Figure 1 indicates that the model is stable since CUSUM and CUSUM of squares lines is within the 5 percent significance region

## Granger Causality Results

This section interprets causality direction between the regressand and the regressors.

**Table 7: Granger Causality Test**

| Null Hypothesis: | Obs | F-Statistic | Prob. |
|---|---|---|---|
| CRR does not Granger Cause LANDA | 58 | 0.32323 | 0.7252 |
| LANDA does not Granger Cause CRR | | 0.89546 | 0.4145 |
| MPR does not Granger Cause LANDA | 54 | 0.02682 | 0.9735 |
| LANDA does not Granger Cause MPR | | 0.20980 | 0.8115 |
| MS does not Granger Cause LANDA | 58 | 0.73913 | 0.4824 |
| LANDA does not Granger Cause MS | | 0.31052 | 0.7344 |
| REXR does not Granger Cause LANDA | 58 | 0.78564 | 0.4611 |
| LANDA does not Granger Cause REXR | | 2.92089 | 0.0626 |

*Source:* Author Computation Eview 9

Table 6 reports that there is only significant uni-directional causality in the model, which runs from LANDA to REXR without feedback, significant at 5 percent. This means LANDA granger causes REXR while the remaining cases show non causality among the variables and are insignificant at any level.

## DISCUSSION OF THE RESULT

**Cash Requirement Reserve:** The interaction between cash reserve requirement and loan and advances made by the deposit money banks shows positive and significant relationship at 5 percent confidence level in the long run. This result indicates that cash reserve requirement offer satisfactory support for expanding loan and advances banks lending within the period of research. This finding is consist with Otolu, Oladesaumi, & Okapo (2004), John and Nwachkwu, (2017) in Nigeria, who found that cash reserve requirement have positive significance impact on loan and advances in the long run, the result of the finding contradicts that of the study of Were & Wambua (2014) in Kenya, and Ajayi & Atanda (2012) whose find negative but significant relationship between cash reserve requirements and loan and advance. the reason behind this relationship is that, the government ability to increase bank reserve through expansionary monetary policy will raise bank deposit and the quantity of loan available, as Bananke & Blinder (1988) argued that, monetary policy transition mechanism is important in substitution between bank loan, by changing the quantity of bank reserve and existence of imperfect prime adjustment prevents monetary shock from been neutral.

Also in the short run, the coefficient value of cash reserve requirement yields negative's but significantly at 5 percent confident interval to loan and advances in Nigerian money deposit banks. The findings reveal that, in the short run cash reserve requirements cannot

expand loan and advances. This may result from a decrease in the banks reserve as earlier agued by Heuvel (2005) where he maintained that lowering bank reserves, contractionary monetary policy reduces the ability at which banks accept receivable deposit, if reserve requirement are binding. Under this condition null hypothesis can be accepted in favor of alternative hypothesis. This result is in conformity with the findings of Felicia (2011). Who found that, there is a negative relationship between cash reserve requirement and banks lending.

**Broad Money Supply:** in the long run and the short run the coefficient value of broad money supply exert positive significance influences on loan and advances at 5 percent level, this indicate that the higher the money supply the higher the banks portfolio assets which may tend to support monetarist theory argument as maintained that an increases in money supply increase banking credit creation ability through multiplier effects (Jhingan, 2005). Under this condition the null hypothesis will be rejected in favor of alternative hypothesis. Thus money supply has greatly impacted on bank loan and advance in Nigeria within the specific period of study. The finding is in conformity with the findings of John and Timothy (2017), Amidu (2004), Gilchrist (1994), Ogbulu & Torbira (2012), Okpara (2010) and Solomon (2013), It contradict that of Damena (2011) in Tunisia, Ajayi & Atanda (2012), and Gambacorta & Lannoti (2005) who found out that, money supply have negative and insignificant effect to bank lending.

**Monetary Policy Rate:** how ever both in the short run and the long run the relationship obtained between monetary policy rate and loan and advances is negative and significant at 5 percent level in line with the theoretical explanation that contractionary monetary policy will lead to an increase in the short term nominal interest rate that will raise the bank's capital spending consequently this will lead to the fall in the banks output. Therefore the null hypothesis will be accepted. This finding is in support of past empirical finding of Giltchrist (1994), Alex (2014), Otula, Oladesonni & Okapo (2004), Victor & Eze (2014), Antua & Apau (2013) in Ghana and Were & Wambua (2014) in Kenya. Khashyab & Stein (1995) in India, and contradict the finding of Ajayi & Atanda(2012), Omakharintan, Okorie & Taiwo (2015) John & Timothy,(2017), Loupias, Savingnac & Savatri (2001), and Lowrencias (2018) who found out that monetary policy rate is positive and significant to loans and advances. However, this finding contradicts monetarist theorist, that monetary policy when effectively utilized can have effect on bank activities and portfolio most particularly improve their loan performance. This has indicated that monetary policy rate in Nigeria within the period of this study was not effectively managed and utilized. Perhaps this resulted was due to the raise in capital base to ¦ 25 billion in 2005 on commercial banks in accordance with the capitalization base with the introduction of new monetary policy implementing minimum rediscount rate (MRR) to monetary policy rate (MPR) specifically, because this was done to dampen the volatility of interest rate in money market and stimulate a transaction rate that would improve the transaction of monetary policy action.

**Real Exchange Rate;** the co-efficient value of real exchange rate showed a negative significance at 5 percent level of significance to loan and advances made by the money

deposit banks in Nigeria, both short run and long run within the period of the study, this has conditioned the accept the null hypothesis as against the alternative hypothesis. This finding is associated with the previous empirical result obtained by Abdussamad (2015) in Pakistan and Ajayi & Atanda (2012).among other provides that exchange rates was not good for banks lending this will be attributed to frequent decrease in the value of local currency in the international market and would discourage banks from investing their money in issuing loans and advances due to the uncertainty in the market but an increase in the local currency value will on the other hand encourage savings with the financial institutions due to the raise in the stability of local currency.

## Long Run Relationship between Monetary Policy and Bank Lending

The second objective is to assess the long-run relationship between Monetary Policy instruments and bank lending in Nigeria. The study used ARDL Bound testing for the level of relationship irrespective of order of integration of underlying series applied on the data to ascertain the relationship between, monetary policy and bank lending in Nigeria. The study results in applying bound test shows the long run relationship treated between loan and advance and independent variables cash requirement rate, money supply, open market operation and monetary policy rate, this finding compel a rejecting of the null hypothesis and acceptance of alternative hypothesis that there is a long run relationship. The finding is in line with John & Nwachukwu (2017), Alex (2014), Otolu, Oladesaumi & Okapo (2014), Felicia (2011), Omokharintan, Okorie, and Taiwo (2015), Stefan and Galina (2018), Loupias, Savegnac & Sevetri (2001), Lourencia (2018), and Ogbulu & Torbira (2012). The findings contradict the findings of Amidu (2004) and Omorokunwa & Adegboye (2011). Also the study observed that there is co-integrating relationships among the variables except in the fifth model in which REXR is the dependent variable. Thus, the findings of the study confirm that monetary policy does not only affect the economy in the short run but it is also effective in the long run. Bound testing has proved this scientifically in the study.

## Cousal Relationship

Finally, the last objective is to evaluate the direction of the causality between Monetary Policy instruments and lending of Money Deposit Banks in Nigeria. The study established there is only unicausality between the dependent LANDA cause REXR, MPR cause LANDA, MPR cause REXR and MS cause REXR. This is true because previous and present levels of loans and advances tend to affect the prices of equities inversely. This finding is in line with that of Omorokunwa & Adegboye (2011), who found that unidirectional causality exists between some monetary policy instruments and banks lending

## CONCLUSIONS AND RECOMMENDATIONS

The work investigated the impact of monetary policy on bank lending in Nigeria. The study adopted monetary transmission mechanism theory as its theoretical framework that

incorporated the role of monetary policy. To achieve its objectives, the study employed Autoregressive Distributive Lag (ARDL) model as statistical tool to analyze the impact of monetary policy on bank loan and advances. The study came up with the following findings:

First and foremost, long run forcing variable explaining loans and advances and money supply have positive significant relationship while, cash reserve requirements, monetary policy rate and exchange rate are negative to loan and advances and significance at 5 percent. Also the finding shows unidirectional causality without feedback between loans and advances, monetary policy rate, money supply and cash requirement reserve. Finally, the study observed that the model has a convergent adjustment rate of 68 percent, which implies that the model adjusts to equilibrium at 68 percent quarterly. Following the general findings the work concluded that monetary regulatory institution has to arrange proper action where there are short coming to improve the banking performances in relation to lending.

In the light of the findings of the study, the following measures are recommended. First, monetary authority should focus more on cash reserve requirement, monetary policy rate and real exchange rate if it aims to make desired changes in the short-run. For instance, if the goal is to boost loan and advances in the short run, then monetary policy rate should be cut down marginally by so doing, cash at the vaults of DMBs could be increased and lending rate may also go up slightly thereby encouraging the banks to offer loans and advances.

Secondly, when monetary authority seeks to achieve long-run goal, expansionary monetary policy is more appropriate by injecting more money in the economy through monetary instruments by purchasing back or reducing sales of government securities also certain incentives should be made on deposit by the banks to attract more deposit from customers thereby raising the bank reserves, having increases in the bank reserve liquidity and so the loan capacity of money deposit banks will also go up.

Finally, central bank of Nigeria should design an optimum interest that will encourage deposit and banks lending that will not discourage savings, investment and receiving loans and advances by the customers, especially during the contractionary monetary policy.

### *References*

Aban, M. J. C. (2013). Transmission of monetary policy through the bank lending channel in the Phillipines. *International journal of trades, Economics and Finance. 4(1) 37-42*

Abdul-Rafay K. & Saqib F. (2019). Islamic Banking System: a credit channel of monetary policy – evidence from emerging economy. *Economic research – Ec\konomska istrajibanja 2019 vol 32 No 1 742-754*

Abdus Samad, M. (2015). Determinant of Bank Profitability: Empirical Evidence from Bangladesh: *International Journal for Financial Report VOL. 6 No 3: 2015.*

Acheampong, K. (2005). Bank interest rate channel of monetary policy transmission mechanism of monetary policy in Ghana, Working Paper 2.

Adegboye, F.B. Olowe, O.O. & Uwuigbe O. (2013). Return on Investment Of Money Deposit Banks In Nigeria. *Journal of Applied Finance and Banking Vol 3 No 3 2013 195-306 ISSN 1792-6580.*

Ajayi, F. O & Atanda, A. A. (2012). Monetary Policy and Bank Performance in Nigeria. two-Step Co-Integrations Approach. *African Journal of Science and Research, Vol. 9. No 1(2012), ISSN 2220-9433.*

Ajie, H. & Nenbe, S. (2010), An Econometric analysis of Monetary Policy and Stock Price in Nigeria; *international Journal of Economic research and investment,*

Akanbe, P. & Ajagbe, B. (2012). (2013), the Efficiency of liquidity management and Banking Performance in Nigeria *International Journal Review of Business and Management Research (2)1.*

Akinne, S. (1986). Determinant of European Bank Profitability, *A Note Journal of Banking and Finance16(6) Pp;1143-1178*

Alex, E. O. (2005), Trend On Profitability of Banking in Nigeria before and during the Interest Rate Regulation" *Nigerian Deposit Insurance Corporation Quarterly Report Vol 13 Num 3 Sept,*

Amidu, M. & Wolf, J. (2008). Implication of Monetary Policy on Bank Credit in Ghana. *IAABD 2008*

Antua & Apau (2013). Bank Efficiency Ghana; Analysis of Middle Income Customers, *International Monetary Fund.*

Bernake, E. & Gertler. (1995). Inside The Black Box. The Credit Channel Of Monetary Policy. *Journal of Economic Perspectives.Vol 34*

Bernake, E. & Blinder, W. (1988 ). Concentration And Other Determinant Of Bank Profitability In Europe. *North American And Australian Journal of Banking And Finance. 13,*

Christophe C. Anne D & Willam M. (2017). Unconventional Monetary Policy and Bank Lending Relationship. BIS Working paper No 18

Cloudio B. & Leonardo G. (2017). Monetary Policy and Bank Lending in Low Interest Rate Environment: diminishing effectiveness. BIS Working paper No 612

Damena. D. H. (2011). Determinant Of Commercial Bank Profitability, An Empirical Ethiopian Commercial Banks. Addis-Ababa. *University Department Of Accounting And Finance. Retrieved From Etd.Aau.Edu.El/Dspace/Betstreem/...../1/ Bebaynet%20%20% Haidegeageis-PDF.*

Felicia, O. O. (2011). Determinant Of Bank Lending Beheviour In Nigeria; *International Journal Of Financial Research Vol 2 No 2 July 2001 Www.Sciedrda/Ijfr.*

Gambacorta, R. & Lanni, S. (2005). Asymetric Responds of Bond Interest rate to Monetary Shock in Italy. *Applied Economic Journal.*

Giltchrist, S. (1994). Bank Lending and Monetary Policy Evidence on Credit Channel. *Federal Reserve Bank of Kansas.*

Gupta, A. (2008). Comparing Bank Lending Channel in India and Pakistan (MPRA Paper 9281) Vancouver University of British Colombia.

Heuvel O. A. (2005). The Relationship Between Capital And Earning In Banking *Journal Money, Credit And Banking 27, 432-456 Http;//Dx.Org/10/,2307/2077876*

Jeuken P. (1999). Banking Chrises And Exchange Rate Regime, Is There A Link? *Journal of International Economic 61(1)41-47*

Jegede, C. A. (2014). Effect Of Monetary Policy On The Commercial Banks Lending In Nigeria. *Review Journal of Administration and Management Vol3 No 5 July 2014. ISSN 2315-7844.*

Jhingan M. L (2005). Advance Economic theory, *Indian publisher, New Delhi India*

John O.O & Nwachukwu T. (2017). Monetary Policy and Credit Delivery in Commercial bank; Evidence for Nigeria; *International Journal of Social Science Management research VOL 3 No 7 2017*

Kayshap, P. & Stein, V. (1995). The Effect of Monetray Tightening on Bank Volume of Loan *Fedaral Reserve Bank of Bostom.*

Khan, C. U. & Mukharanjee, S. (2001). Compatetion and Incentive with Nonexclusive Contract *RAND Journal of Economic*

Laurencia L. (2018) The signaling effect of monetary policy on lending rate

Loupias C, Savignac F & Savistri P. (2001). Monetary policy and bank lending in France: are their asymmetric? Working paper series 101 European Central Bank

Mansor, H.I. (2005). Sectorial Effect Of Monetary Policy: Evidence From Malaysia Asian *Economic Journal,* 19(1), 83-102.

Motemilda, B. T. Banny A. M. & Muhtar F. E. (2014). The Impact Of Monetary Policy On Lending Rate In South Africa. Borsa Instabul Review 15-1 (2015) 53-59 *Http://Www.Elsview.Com/Journal - Instanbul-Review/2214-8450.*

Morris C.S, & Sellon G.H. (1995). Bank lending and monetary policy: evidence on a credit channel. Economic Review, Second Quarter 1995 59-75

Odufalu N.. (1994). Impact Of Capital Structure On Banking Performance; A Case Study Of Uganda, *Interdisplinary Journal Of Contemporary Research In Business, VOL 4 No 10 Pp393-403*

Ogunbiyi, S.S. & Ihejirika, O.P. (2014). Interet Rate And Money Deposit Bank' Profitability Nexus; The Nigerian Experiace. *Arabian Journal Of Business And Management Review (Oman Chapter)Vol. 3 No 11 June 2014*

Okpara, G.C. (2010). Monetary Policy and Stock Market Returns Evdence from Nigeria. *Journal of Economics* 1(1)

Okoye, V. & Eze, O. R (2013). EFfect of Bank Lending Rate on The Performance of Nigeria Deposit Money Bank; *International Journal Of Business And Management Review Vol. I No I Mar 2013 Pp 34 -43 Published By European Centre For Research Training And Development Uk Www:Eujournal.Com*

Olokoye F. O. (2011) Determinant of commercial bank lending beheviour in Nigeria *International journal of Financial Research2(2), 61*

Otalu, J.A. Aladesaumi, K.A. & Okapo, B.M. (2004), Monetry Policy And Commercial Banks Performance In Nigeria: An Assessment Of Credit Creation Role. *The International Journal Of Businessand Management (ISSN 2321-8916).*

Omakharintan, A.E. Okorie U.E. & Taiwo, J.N. (2015). A Dynamic Analysis Of The Relationship Between Monetary Policy And Loan Risk Exposure In Nigeria Deposit Money Bank. *Medetarenial Journal Of Social Science MCSER Publishing, Rome=Italy ISSN 2039-2117(Online) Vol 6 No 6 Nov 2015.*

Omorokunwa O.G. & Adegboye A.C. (2011) Monetary Policy and Lending Habit in Nigeria. *The International Journal Of Businessand Management.*

Pesaran, H. Shin Y. & Smith, R. (2001). Bound Testing Approach To The Analysis of Level Relationship *Jounal of Apply Econometric 14(3) 289-326.*

Richard, J.T. (1979). Monetary Policy and Theory, *New York player publishering Inc.*

Sanusi, A. (2010). Interest rate pass through and the efficiency of monetary policy in Nigeria. 2002-2010

Samson, O. O. & Tarila B (2014). Deposit Money Bank and Economic Growth in Nigeria; *International Journal of Finance No 1/ 2014. DOI 5817/FA 12014-1-3.*

Segum O. in Central Bank of Nigeria (2009) How does the Monetary Policy Decisions of the Central Bank of Nigeria affect You? *Nigeria.Publication of Central Bank of Nigeria.*

Sethi, F. (2007), The Effect of Liquidity Risk on the Performance of Commercial Banks *International Research Journal of Applied and Basic Science4(6).*

Shahateet M.I. (2014). Modelling Economic in Arab Countries Co-Integrationand Causality Relationship *Jounal of Economic and Policy. 4(3) 349-359*

Solomon, O. (2013). Impact of Monetary Policy on Bank Performance in Nigeria. *www.independant. acadamia.edu*

Somoye, R. O. C. & lio, B. M. (2009). The Impact of Macroeconomic Instability on the Banking Sector Lending Behaviors in Nigeria. *Journal of Money,Investmentand Banking.*

Soludo, C. C. (2014). Consolodeting The Nigerian Bankin Industries, to Meet Devolpment Challenges of 21st Centuarybeing and Address Deliver to the Special Meeting of Bankers Committee, Held on 26th July, At CBN Headquaters, Abuja

Sunday, B. & Thabita, N. (2015). Effect of Macroeconomic Factors On Finanacial Performance of Commercial Banks In Nigeria, *International Journal of Socialscience and Information Technology VOL. II Issue IX Octorber 2016 ISSN 2412-0292.*

Stefen A. & Galina H. (2018) US Monetary Policy and Fluctuation of International Bank Lending. BIS Workinh Peper No 730

Uchendu, O. (1995). Monetary Policy and the Performance of Commercial Banks in Nigeria; Central Bank of Nigeria. *Economic and Finance Review, Vol 33 No 2. June Pp 156-170*

Udende, S. N. (2009). Impact of Monetary Policy Instrument on Profitability of Commercial Bank in Nigeria: Zenith Bank Experience. *Research Journal Of Finanace And Acconting. ISSN 2222-1697 ONLINE VOL. 6 No 10. 2015.*

Victor, O. & Eze, O. R. (2014). Effect of Bank Lending Rate on the Performance of Nigerian Deposit Money Banks. *International Journal Of Business And Management Review Vol. 1, No. 1, March 2013, Pp.34-43 Published by European Centre for Research Training and Development Uk (www.Ea-Journals.Org)*

Were M. & Wambua J. (2014), What Factor Drive Interest Rateb Spread In Commercial Bank? Empirical Evidence from Kenya. Rev DEV Finance *Http://Dx.Doi/1016/J.Rdf.2014.05 005.*

Xu & Chen (2012). Circlical Pattern in Profit Provissining and Lending of Bank and Pro-Cyclicality of the New Capital Requirements. *BNL Quaterly Review.*

Younus, S. and Akhtar M. (2006) The statutory liquidity requirement as monetary policy instrument in Bangaladash IMF occasional paper No 234 Washington IMF.