Monetary Policy and Deposit Money Banks Lending in Nigeria 2000-2020

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Abstract: **This study investigated the effect of monetary policy on deposit money banks lending in Nigeria (2000 - 2020) using secondary data from Statistical bulletin of Central Bank of Nigeria. The research work used the Vector Autoregressive Estimates to test the effect of the independent variables (Monetary Policy Rate, Liquidity Ratio, Cash Reserve Ratio and Loan to Deposit Ratio) on the dependent variable (Total loans and advances). The study found that monetary policy has negative and significant effect on deposit money banks lending in Nigeria within the period of the study. The study therefore advocates that monetary authority should strive to maintain a reasonable interest rate that will tends to reduce cost of borrowing and lending in the economy. There is need to strengthen bank loan and advance and monetary policy through effective and efficient regulation and supervisory framework. Government should through the Central Bank of Nigeria ensure working monetary policy instrument and make a periodic review of the polices in a way that will encourage bank lending. Monetary authority should manage the lending rate properly for it to be attractive and affordable for investors to borrow money from the bank. In conclusion, monetary policy rate, liquidity ratio, cash reserve ratio and loan to deposit ratio should be looked into by monetary authority in a way that is friendly to loan advancement especially relating to those who are in need of it. Finally, monetary policy should not be used in isolation but in collaboration with fiscal policy.**

Keywords: **Monetary Policy and Bank Lending**

I. INTRODUCTION

The world is barely recovering from the damages caused by the Covid-19 pandemic. To reflate and put world economies (especially developing economies) back to the era of sustained growth and prosperity, finance would play an essential role in this regard. As developing economies seek for external funding sources and seeks debt cancellation and rescheduling, internal funding sources becomes even more pertinent especially in the private sector. Consequent on this, an empirical exploration of the effect of monetary policy variables on bank lending (that is, credit creation) in Nigeria is timely.

Monetary policy is a policy employed by Central Bank in the control of money supply as well as an instrument for achieving the objectives of general economic policy. Ajie and Nenbe (2010) asserted that monetary policy is one of the macroeconomic instruments with which nations (including Nigeria) do manage their economies and this monetary policy affects the performance of banks. The objectives of monetary policy include full employment, domestic price stability, adequate economic growth and external sector stability. The supplementary objectives of monetary policy include smoothening of the business cycle, prevention of financial crisis and stabilization of long-term interest rates and real exchange rate (Jegede, 2014). The Central Bank of Nigeria has been engaging its monetary policy towards reducing inflation through regulating interest rates (monetary policy rates, treasury bill rates and lending rates) and reserve requirements (Cash reserve ratio and minimum liquidity ratio). For instance, with the rise of inflation rate from 9.55% to 18.55% between 2015 and 2016, the Central Bank of Nigeria increased the monetary policy rate from 11% to 14% which also resulted in a hike in the lending rates of Deposit Money Banks (CBN Bulletin, 2018). Apparently, a hike in lending rate is likely to cause an abysmal effect on the earning capacity or profitability of Deposit money banks (DMBs) as credit creation would be badly affected.

Previous researchers have also established that the frequent adjustments made on monetary policy instruments affect the performance of banks in terms of their profitability and lending activities. For instance, Kelilume (2014), asserted that monetary policy rate has remained a major potent monetary policy tool used by monetary authorities in setting targets and direction of other rates and in driving the movement of other macroeconomic aggregates in both developed and developing countries. This implies that the rates at which banks lend to their customers are influenced by the monetary policy rate (MPR) of the Central Bank of Nigeria. Thus, a rising MPR may pose a challenge to the lending operations of banks, as borrowers may not be able to meet up with the high lending rates. This will in turn affect the level of investments and the level of gross domestic product of the country. In other words, banks still face major issues in relation to changes in the quantitative tools of monetary policy (Onodugo et al, 2013).

Moreover, taking a cursory look into the Central Bank statistical bulletin, one would also notice that there have been times when adjustments in monetary policy instruments did not amount to any tangible change in the level of interest rates and credit availability. Afolabi et al (2018) noticed that the credit of deposit money banks to private sectors rose from N10,660.07 Billion in 2011 to N18,674.15 in 2015 in spite of the adjustments carried out on the monetary policy instruments during that period. Thus, the assumption of some scholars that adjustments in monetary policy instruments affect the performance of banks needs empirical investigation.

Hence, this research work is intended to find out if there is really a significant relationship between monetary policy instruments and deposit money banks' total loans and advances.

Some studies show that monetary policy induces the the lending capacity of deposit money banks in Nigeria as observed by (Akanbi & Ajagbe ,2012; Isedu ,2013; Jegede ,2014; Akomolafe, Danladi, Babalola & Abah ,2015; Borio, Gambacorta &Hofmann ,2015; Ekpung, Udude & Uwalaka,2015; Anowor & Okorie ,2016; Oladele ,2017; Olaoluwa & Shomade ,2017; Afolabi, Adeyemi, Salawudeen & Fagbemi,2018), while others showed that monetary policy has insignificant effect on the lending of deposit of money Banks in Nigeria(Okorafor ,2010; Onodugo, Okoro, Amujiri & Onodugo ,2013; Kelilume ,2014; Udeh ,2015; Dare & Okeya ,2017; Uloma ,2017). This implies that the effect between these two variables is far from being empirically settled. Thus, studies in these areas appear inconclusive. The different results obtained by the empirical studies do not permit the researchers to draw an unequivocal conclusion on the subject matter thus the need to re-examine the effect of monetary policy on deposit money banks' lending in Nigeria from 2000 to 2020.

II. LITERATURE REVIEW

In Nigeria, monetary policy tools have been subjected to various forms of gyrations in keeping with the fluctuations in economic indices. Each time these policies change, bank operations are certainly affected (Udeh, 2015). In Nigeria, the banking ordinance of 1952 is seen as the root of monetary policy guiding the financial institutions in the country. Banks offer demand on transaction deposits as well as provision on lending services and because of these degree of risks in the banking sector, their businesses are heavily regulated. This regulation of banks came into existence to combat bank failures of the 1940s and 1950s. Subsequently, other monetary policies came up in 1958, 1969, 1979 and it has been so till date (Udeh, 2015).

Monetary policy in Nigeria has experienced two main phases which are the era of direct control (1959-1986) and the era of market-based controls (1986-date). In the era of direct control, the CBN used directives targeted at specific sectors to fix or control interest rate, exchange rate, determine credit allocation to choose sectors, etc. (Osakwe, Ibenta &Ezeabasili, 2019). The CBN (2018) identified the instruments of monetary policy currently used as monetary policy rate, treasury bills rate for OMO, Reserve Requirement, as market-based instruments, while moral suasion, interest rate and control of the banking system are direct policies still applicable in Nigeria.

Through the monetary policy guideline of the Central Bank of Nigeria (CBN) which are made public or available to banks annually or periodically, the CBN gives clear-cut directives on the extent to which commercial banks can create credit. The Central Bank of Nigeria (CBN) by law controls and supervises the activities of other banks (Deposit Money) with Open Market Operation (OMO), discount rate policy (DRP), reserve requirement rate (RRR), minimum rediscount rate (MRR), minimum liquidity ratio (MLR) and even Loan to Deposit Ratio (LDR). To ensure a stable domestic monetary environment, CBN exercise control over the deposit of banks and tendency to increase size as well as the level of money supply (Uloma, 2017).

2.1 Monetary Policy Instruments

According to Uloma (2017), the instruments of monetary policy can be categorized into two namely:

1. Direct or quantitative instruments
2. Indirect or qualitative instruments

Direct Instruments or Qualitative Instruments of Monetary Policy

Though there is an avalanche of instruments available for money and credit control, the instrument mix to be employed at any time depends on the goals to be achieved and the effectiveness of such instrument to a large extent hinges on the economic fortunes of the country.

- *Reserve Requirement:* The Central Bank may require Deposit Money Banks to hold a fraction (or a combination) of their deposit liabilities (reserves) as vault cash and or deposits with it. Fractional reserve limits the amount of loans banks can make to the domestic economy and thus limit the supply of money. The assumption is that Deposit Money Banks generally maintain a stable relationship between their reserve holdings and the amount of credit they extend to the public.
- *Special Deposits:* The Central Bank has the power to issue directories from time to time requiring all banks to maintain with it as special deposit an amount equal to the percentages of the institution's deposits liabilities or the absolute increase in its deposit liabilities over an amount outstanding at a certain date.
- *Moral Suasion:* Moral suasion simply means the employment by the monetary authority of friendly persuasive statement, public pronouncement, outright appeal, the monetary authority sometimes uses the less tangible technique to influence the lending policies of commercial banks.
- *Selective Credit Control:* This instrument is used to distinguish among the sectors of the economy into preferred and less preferred sectors. This is usually designed to influence the direction of credits in the economy so as to ensure that credits go to those sectors designed "preferred". It is very useful where a country operates development plans like Nigeria. When plans are

drawn up these credit controls will be integrated in the budget. In course of the government's programme to revitalize agricultural production which is the most favored sector, credits to the favored sector is at lower interest rate while the least favored sectors pay the highest rate of interest.

- *Direct Credit Control:* The Central Bank can direct Deposit Money Banks on the maximum percentage or amount of loans (credit ceilings) to different economic sectors or activities, interest rate caps, liquid asset ratio and issue credit guarantee to preferred loans. In this way the available savings is allocated and investment directed in particular directions.
- *Prudential Guidelines*: The Central Bank may in writing require the Deposit Money Banks to exercise particular care in their operations in order that specified outcomes are realized. Key elements of prudential guidelines remove some discretion from bank management and replace it with rules in decision making.

Indirect Instruments or Quantitative Instruments of Monetary Policy

The instruments of monetary policy used by the Central Bank depend on the level of development of the economy, especially its banking sector. The commonly used instruments are discussed below:

- *Open Market Operations***:** The Central Bank buys or sells (on behalf of the Fiscal Authorities (the Treasury) securities to the banking and non-banking public (that is in the open market). One such security is Treasury Bills. When the Central Bank sells securities, it reduces the supply of reserves and when it buys (back) securities-by redeeming them-it increases the supply of reserves to the Deposit Money Banks, thus affecting the supply of money.
- *Lending by the Central Bank*: The Central Bank sometimes provide credit to Deposit Money Banks, thus affecting the level of reserves and hence the monetary base
- *Interest Rate*: According to Obidike, Ejeh and Ugwuegbe (2015), The Central Bank lends to financially sound Deposit Money Banks at a most favourable rate of interest, called the minimum rediscount rate (MRR). The MRR sets the floor for the interest rate regime in the money market (the nominal anchor rate) and thereby affects the supply of credit, the supply of savings (which affects the supply of reserves and monetary aggregate) and the supply of investment (which affects full employment and GDP).
- *Exchange Rate***:** The balance of payments can be in deficit or in surplus and each of these affect the monetary base, and hence the money supply in one direction or the other. By selling or buying foreign exchange, the Central Bank ensures that the exchange rate is at levels that do not affect domestic money supply in undesired direction, through the balance of payments and the real exchange rate. The real exchange rate when misaligned affects the current account balance because of its impact on external competitiveness (Imoisi, Olatunji & Ekpenyong, 2013).
- *Rediscount Rate***:** The rediscount rate is the rate at which the central bank stands really to provide loan accommodation to commercial banks. As a lender of last resort, such lending by the central bank is usually at panel rates. By making appropriate changes in the rate, the central bank controls the volume of total credits indirectly. This has the purpose of influencing the lending capacity of the commercial banks. During the periods of inflation, the central bank may raise the rediscount rate making obtaining of funds from the central bank more expensive. In this way, credit is made tighter. Similarly, in depression, when it is necessary to encourage commercial banks to create more credits, the central bank will lower the rediscount rate.

2.2 Monetary Policy Rate

Corb (2012) asserts that interest rate is an economic tool used by the CBN to influence money supply and to control inflation and to boost economic development. The transmission of monetary policy action is often effected through interest change. Being a cost for borrowing and a reward for lending, the interest rate is an important economic variable which need to be guided so as to achieve economic stability (Kelilume, 2014). The CBN statistical Bulletin (2018) reveals monetary policy rate as one of the money market interests rates alongside Treasury bill rate. Several studies confirm that interest rates affect the financial performance of deposit money banks. The Monetary Policy rate is an intrinsic part of the monetary policy of the CBN and it is used to regulate the lending activity of the deposit money banks.

The monetary Policy rate refers to the amount that is charged by the Central Bank of Nigeria (CBN) for lending to the Banks in the performance of its function as the lender of last resort and also as a signal of the desired direction of monetary policy (CBN Annual Reports, 2018). Money borrowed from the Central Bank of Nigeria by banks is to be repaid at a particular interest rate known as monetary policy rate. The monetary policy rate is the nominal anchor which influences the level and direction of other interest rates in the domestic money market. Its movements are intended to signal to the market operators the monetary policy stance of the CBN

(Isedu, 2013). Hence, banks' lending interest rates are influenced by the monetary policy rate and the process by which banks' interest rates respond to changes in the monetary policy rate is referred to as the interest rate pass-through process.

According to Bassey (2018), the MPR is the interest rate set by the CBN to serve as indicative rate for transactions in the interbank market. It was introduced in December 2006 and is used as the operating target for monetary policy. It also serves as a signaling device for the monetary policy stance. The Monetary Policy Committee (MPC) sets an interest rate corridor of MPR ± 2-5 percentage points as the tolerable margin for the Open Buy Back (OBB) rate. At times, the CBN used asymmetric corridor around the MPR, particularly in the aftermath of the 2009 banking crisis.

2.3 Liquidity Requirement

According to Ekpung, Udude and Uwalaka (2015), Liquidity is defined as the ability to obtain needed cash quickly at a reasonable cost. It also means being able to meet financial obligations as they fall due, whether it is withdrawing from the current account, savings account or inter-bank deposits. Liquidity is essential for the banking sectors. Sources of bank liquidity can be in form of stored liquidity, which consists of assets in form of values and balance at Central Bank. As increase in the required liquidity ratio necessarily reduces the profitability rate of banks since they would have to hold some of their assets in treasury bills and certificates, the return which are quite below those of other money markets instruments, loans and advances.

Douglas (2014) asserted that Liquidity at a bank is a measure of its ability to readily find the cash it may need to meet demands upon it. Liquidity can come from direct cash holdings in currency or on account at the Federal Reserve or other Central Bank. More commonly it comes from holding securities that can be sold quickly with minimal loss. This typically means highly creditworthy securities, including government bills, which have short-term maturities. Douglas (2014) also highlighted means by which banks can achieve adequate liquidity. These means include: shorten asset maturities; improve the average liquidity of assets; lengthen liability maturities; issue more equities; reduce contingent commitments; obtain liquidity protection.

According to Olagunju, et al., (2011) in Kurotamunobaraomi, Giami and Obari (2017), Liquidity consists of the Vault Cash, Balances Held With CBN, Balances Held With Other Banks in Nigeria, Balances Held With Offices & Branches outside Nigeria, Money at Call in Nigeria, Inter-bank Placement, Placement with Discount Houses, Treasury Bills, Treasury Certificates, Investment in Stabilization Securities, Bills Discounted Payable in Nigeria, Negotiable Certificates of Deposits, Bankers Acceptances and Commercial Papers, Investments in FGN Development Stock and Industrial (Other) Investments.

2.4 Cash Reserve Requirement

According to Bassey (2018), the Cash reserve requirement (CRR) is the proportion of specified total deposit liabilities of Deposit Money Banks (DMBs) that is kept with the CBN as reserves. It is mostly unremunerated and is measured based on a daily average of reservable liabilities over a two-week period. It serves prudential monetary control and liquidity management objectives. Changes to the CRR require banks to make abrupt adjustments in their portfolios and as such can induce volatility in financial market prices. An increase in the CRR, particularly when it is unremunerated, imposes additional costs on banks, which then get passed on to the economy in the form of wider interest rate spreads.

The CBN Annual Reports (2018) asserted that Reserve Requirement refers to the proportion of total deposit liabilities which the deposit money banks are expected to keep as cash in vaults and deposits with the CBN. The CBN can control the money stock by varying the requirement as desirable. Usually, banks keep reserves over and above the legal requirement for safety. The cash reserve ratio is the percentage of deposit money banks' cash deposits with the CBN in relation to their total demand deposits, savings and time deposits. The cash ratio requires the deposit banks to keep a certain proportion of their total deposit liabilities as cash balances with the CBN, while the liquidity ratio stipulates the proportion of total deposits to be kept in specified liquid assets, mainly to safeguard the ability of banks to meet depositors' cash withdrawals and ensure confidence in the banking system. The CBN also has powers to call for special deposits from banks for the purpose of controlling liquidity.

2.5 Loans-to-Deposit Ratio

Loan-to-deposit ratio (LDR) is a useful instrument to determine bank liquidity, and by extension, it influences the profitability of the banks. The ratio is calculated by dividing the total amount of loans by the total amount of deposits. A high LDR indicates two things: firstly, the bank is issuing out more of its deposits in the form of interest bearing loans. Hence, the bank is at high liquidity risk. Secondly, the bank generates more income. Alternatively, very low ratio means that the bank is at low risk and at the same time, it is not using its assets to generate income (Dhanuskodi, 2014). The Central Bank of Nigeria regulates the liquidity of banks by prescribing the maximum loan to deposit ratio. When compared with the maximum prescribed LDR, if the bank's LDR is greater, the bank is at high liquidity risk because it is lending out almost all its deposits. Banks strive to maintain a LDR that is below the prescribed LDR (CBN 2018).

Disalvo and Johnston (2017) discovered that loan-to-deposit ratios are related to banks' financial health. Examiners have found that banks with LDR ratios that are well above the average are more likely to be risky along many dimensions besides liquidity risk. For example, banks with large amounts

of loans relative to their deposits may be more aggressive lenders. That is, they may have lower lending standards than more conservatively run institutions. They also may invest in riskier securities to generate higher returns to offset the higher cost of borrowing non deposit funds. As at the last quarter of 2018, the banks' loan to deposit ratio (LDR) stood at 60.16 percent below the prescribed 80 percent. In 2009, the banks' LDR was above the prescribed LDR by 5.66 percent which was indicative of high liquidity risk (CBN, 2018). According to CBN (2020), the prescribed liquidity ratio stands at 30 percent.

2.6 Financial Performance

Stoner (2003) as cited in Rosemary (2013) defines financial performance as the ability to operate efficiently, profitably, survive, grow and react to the environmental opportunities and threats. According to the NDIC Annual Reports (2017), the financial performance of deposit money banks can be grouped into capital adequacy of DMBs; the Asset quality of banks; earning and profitability; and liquidity management of deposit money banks. Selected performance indicators include Total assets; Total loans and advances; capital adequacy; Non-performing loans to total loans ratio; return on assets; Profit before tax and Loan to deposit ratio.

2.7 Asset Quality of DMBs as a measure of Financial Performance

The asset quality of deposit money banks is a measure of the financial performance of the banks. It is one of the rating scales of the CBN supervision of the banking industry. The CBN makes use of the CAMEL rating which is assesses the capital adequacy; asset quality; management efficiency; earnings and profitability and liquidity management. This is the scale that the NDIC employs in its role of supervising deposit money banks. The NDIC annual report (2017) reveals that the asset quality of deposit money banks is one of the means of ascertaining the financial performance of the banking industry and it is made up the following indicators: total loans and advances; Non-performing loans; Non-performing loans to total loans ratio; and the ratio of non-performing loans to shareholders' funds.

III. THEORETICAL FRAMEWORK

3.1 Keynesian Approach

In 1936, John Maynard Keynes published his "General Theory of Employment, Interest and Money" and initiated the Keynesian Revolution. From the Keynesian mechanism, monetary policy works by influencing interest rate which influences investment decisions of financial institutions such as banks and the public and consequently, output and income via the multiplier process (Uloma, 2017). Keynes posits that government had the responsibility to undertake actions to stabilize the economy and maintain full employment and economic growth, using fiscal policies. He therefore recommends a proper blend of monetary and fiscal policies as at some occasions, monetary policy could fail to achieve its objective (Onyemaechi, 2005).

In simple terms, the monetary mechanism of Keynesians emphasizes the role of money, but involves an indirect linkage of money with aggregate demand via the interest rate as symbolically shown below: ↓OMO→↓ R→↑MS→↓r → I→↓GNP

Where, OMO = Open Market Operation
R = Commercial Bank Reserve
MS = Stock of Money
r = Interest Rate
I = Investment
GNP = Gross National Product

On a more analytical note, if the economy is initially at equilibrium and there is open market purchase of government securities by the Central Bank of Nigeria (CBN), this open Market Operation (OMO) will increase the commercial banks reserve (R) and raise the bank reserves. The bank then operates to restore their desired ratio by extending new loans or by expanding bank credit in other ways. Such new loans create new demand deposits, thus increasing the money supply (MS). A rising money supply causes the general level of interest rate (r) to fall. The falling interest rates affects commercial bank performance and in turn stimulate investment given businessmen expected profit. The induced investment expenditure causes successive rounds of final demand spending by GNP to rise by a multiple of the initial change in investment. On the other hand, a fall in money supply according to Jhingan (2004).causes the general level of interest rate (R) to rise or increase thereby increasing the commercial banks profitability.

3.2 The Monetarist Theory

According to Udude (2014) as cited in Dare and okeya (2017), the monetarist essentially adopted Fisher's equation of exchange to illustrate their theory, as a theory of demand for money and not a theory of output price and money income by making a functional relationship between the quantities of real balances demanded a limited number of variables. Monetarists like Friedman emphasized money supply as the key factor affecting the wellbeing of the economy. Thus, in order to promote steady growth rate, the money supply should grow at a fixed rate, instead of being regulated and altered by the monetary authorities. Friedman equally argued that since money supply is substitutive not just for bonds but also for many goods and services, changes in money supply will therefore have both direct and indirect effects on spending and investment respectively such that demand for money will depend upon the relative rates of return available or different competing assets in which wealth can be.

3.3 Empirical Review

Okorafor (2010) examined the impact of monetary policy instruments on the economic development in Nigeria during

the period 1980-2006. With the aid of the t-ratio, the study revealed that only two out of the six selected explanatory variables exert a significant impact on the level of economic development in Nigeria between the study periods (pre-and-post- deregulation). The study therefore, concludes that with the insignificant nature of most of the variables, policy formulation and implementation inconsistencies appear to hinder the full impact of monetary policy on the economy and therefore, should be critically watched.

Akanbi and Ajagbe (2012) carried out an empirical analysis of monetary policy on commercial banks in Nigeria. The results showed that an increase in interest rate will lead to a decrease in the lending rate while liquidity ratio and cash ratio were statistically significant to the profit of the selected banks.

Isedu (2013) examined the empirical effects of monetary policy on macro-economic performance in Nigeria. The results suggested that the effectiveness of monetary policy implementation for counter cynical income stabilization, Balance of payment (BOP) stabilization, and Consumer Price Index (CPI) stabilization in Nigeria. Monetary policy in Nigeria is effective in maintaining internal balance and ineffective in achieving external balance. Overall, the results suggested that monetary policy affects macroeconomic performance in Nigeria.

Onodugo, Okoro, Amujiri and Onodugo (2013) examined the impact of monetary policy regimes on the performance of commercial banks in Nigeria. The study was divided into Structural Adjustment Program (SAP) period (1986-1999) and post-SAP period (2000-2013). The study discovered that monetary policy regimes during the SAP period did not have significant impact on the total assets value, deposit mobilization, loans and advances and credit to the private sector respectively.

Jegede (2014) examined the effect of monetary policy on commercial bank lending in Nigeria between 1988 and 2008, using macroeconomic time series variables of exchange rate, interest rate, liquidity ratio, money supply, and commercial bank loan and Advances. Specifically, the findings revealed that exchange rate and interest significantly influenced commercial banks' lending, while liquidity ratio and money supply exert negative effect on commercial banks' loan and advances. The major conclusion drawn is that monetary policy instruments are not effective to stimulate commercial bank loans and advances in the long-run, while banks' total credit is more responsive to cash reserve ratio. Thus, monetary authority should make efforts to develop indirect monetary instruments and exercise appropriate control over the monetary sector.

Kelilume (2014) asserted that monetary policy rate has remained a major potent monetary policy tool used by monetary authorities in setting targets and direction of other rates and in driving the movement of other macroeconomic aggregates in both developed and developing countries. The study analyzed the effects of monetary policy rate on other rates in Nigeria. The major findings of the study is that the pass-through of monetary policy rate into short term and long term retail interest rates in Nigeria is sticky. The only evidence of the effectiveness of monetary policy can be seen only in the relationship between monetary policy rate and interbank rates.

Akomolafe, Danladi, Babalola and Abah (2015) examined the impact of monetary policy on commercial banks' performance in Nigeria. Interest rate and money supply were used as proxies for monetary policy, while profit before tax (PBT) was used to represent commercial banks' performance. The results show that there is a positive relationship between banks' profits and monetary policies as proxied by money supply and interest rate.

Borio, Gambacorta and Hofmann (2015) investigated how monetary policy affects bank profitability. The study used data for 109 large international banks headquartered in 14 major advanced economies for the period 1995–2012. Overall, it was discovered that there exist a positive relationship between the level of short-term rates and the slope of the yield curve (the "interest rate structure", for short), on the one hand, and bank profitability – return on assets – on the other.

Ekpung, Udude and Uwalaka (2015) investigated the effect of monetary policy on the banking sector performance in Nigeria. The study period covered 36 years from 1970 to 2006, using selected indicator and employing the OLS regression technique. The results showed that overall; monetary policy has a significant effect on the banks deposit liabilities. Meanwhile, on individual basis, it was discovered that Deposit Rate (DR) and Minimum Discount Rate (MDR) had a negative influence on the banks deposit liabilities in Nigeria, whereas Exchange Rate (EXR) had a positive and significant influence on the banks deposit liabilities in Nigeria. The conclusion was that monetary policy plays a vital role in determining the volume of bank's deposit liabilities in Nigeria.

Udeh (2015) examined the impact of monetary policy instruments on the profitability of commercial banks in Nigeria using the Zenith Bank Plc. experience. The paper used descriptive research design. It utilized time series data collected from published financial statements of Zenith Bank Plc. as well as Central Bank of Nigeria Bulletin from 2005 to 2012. The study discovered that cash reserve ratio, liquidity ratio and interest rate did not have significant impact on the profit before tax of Zenith Bank Plc. However, minimum rediscount rate was found to have significant effect on the profit before tax of the bank. The paper concluded that a good number of monetary policy instruments do not impact significantly on profitability of commercial banks in Nigeria.

Anowor and Okorie (2016) opined that Nigeria has over the years been controlling her economy through various macroeconomic policies of which monetary policy is among using some monetary policy instruments in efforts to drive along the desired path. They carried out a reassessment of the impact of monetary policy on economic growth of Nigeria adopting the Error Correction Model approach. The study utilized time series secondary data spanning between 1982 and 2013. The result showed that a unit increase in Cash Reserve Ratio (CRR) led to approximately seven units increase in economic growth in Nigeria.

Oladele (2017) opined that Nigerian banks remain dominant in the banking system in terms of their shares of total assets and deposit liabilities. Their total loans and advances, a major component of total credits to both public and private sectors are still on the increase in spite of the major constraints posted by the government regulations, institutional constraints and other macroeconomic factors. The study was aimed at determining the relationship between interest rate and profitability of deposit money banks in Nigeria. The results of the findings showed that there was a positive significant relationship between lending rate and banks profitability. There was a significant positive relationship between inter-banks rate and banks profitability. There was a positive significant relationship between treasury bills rate and banks profitability and finally, monetary policy rate showed positive significant relationship with banks profitability.

Dare and Okeya (2017) assessed the impact of monetary policy on the performance of commercial banks in Nigeria using the United Bank for Africa (UBA) Plc. as a case study. The study made use of a panel cross sectional data covering the period from 2009 to 2014. Multiple linear regression technique was employed to test the relationships inherent in the explanatory and dependent variables with the aid of Statistical Package for Social Sciences (SPSS), Version 20. The estimated model expresses banks' operating performance as a function of monetary policy represented by Monetary Policy Rate (MPR), Cash Reserve Requirement (CRR) and Liquidity Ratio (LR) while Return on Assets (ROA) is used as a proxy for banks' credit performance. The study found out that there is a positive but statistically insignificant relationship between MPR and ROA in the chosen bank. The analysis further indicated negative and statistically insignificant relationships between CRR, LR and ROA. The study concluded that the rationale for the statistically insignificant relationships observed might not be far from the commercial banks low rate of compliance with monetary policy guidelines.

Olaoluwa and Shomade (2017) appraised the impact of monetary policy on commercial banks' lending behavior in Nigeria. The result from the findings indicated that bank lending behavior is determined by interest rate, exchange rate, and deposit and reserve requirement for the period under review. It was also shown in the result that only interest rate and reserve requirement have a negative and significant impact on commercial bank lending rate while other variables have a positive relationship. The results of the study indicated that there is a long run relationship between deposits and commercial bank lending rate in Nigeria.

Uloma (2017) looked at the monetary policy instruments employed by the Nigerian monetary authorities and their effects on turnover ratio of commercial banks in Nigeria. The objective of the research was to examine the effects of monetary policy instruments — money supply, liquidity ratio, monetary policy rate, and cash reserve ratio- on commercial banks turnover ratio in an attempt at finding out the true nature and the extent monetary policy instruments have been successful in impacting on banking performance in Nigeria. It was apparent from the findings that the high level of forged and decorated balance sheet in the past could have made the monetary policy tools less effective and results unreliable. However, with the various reforms after the financial crises, the prudential guidelines and implementation of a uniform financial statement reporting, the monetary policies of the CBN have tend to yield better results. With the introduction of the Monetary Policy Rate (MPR) by the CBN as the major tool for signaling its monetary stance, the need for a monetary policy reaction function which clearly depicts the decision making intention of the Bank would assist economist and financial markets in predicting the future path of monetary policy.

Afolabi, Adeyemi, Salawudeen and Fagbemi (2018) investigated the relationship that exists between monetary policy instruments and Deposit Money Banks' Loans and Advances in Nigeria. An annual time series data covering a period of 36years from 1981-2016 were sourced from Central Bank of Nigeria and used for the study. The study employed Toda and Yamamoto granger non-causality model to examine the relationship existing between Deposit Money Banks loan and advances and monetary policy variables in Nigeria. The findings revealed that structural changes in monetary policy system exerted positive significant impact on loan and advances of Deposit Money Banks in Nigeria. Findings also revealed bidirectional relationship existing between MPR and loan and advances of Deposit Money Banks in Nigeria. Precisely, MPR proved to be a significant variable which causes Deposit Money Bank loans and advances in Nigeria. The other explanatory variables; broad money supply (LM2), liquidity ratio (LR), inflation rate (IFR) and cash reserve ratio (CRR) does not granger cause loan and advances of Deposit Money Banks in Nigeria within the study period.

Osakwe, Ibenta and Ezeabasili (2019) examined the effect of monetary policy on the performance of the Manufacturing sector in Nigeria. The explanatory variables were monetary policy rate, Treasury bills rate, Cash reserve requirement and money supply; while the dependent variable is the Manufacturing (MANU) sector output. The study covered a

period of 32 years (1986 to 2017). The results indicated that: monetary policy tools have significant effect on the manufacturing sector output in Nigeria in the short run only. The study concluded that monetary policy tools may not be a long run policy instrument for the growth of the manufacturing sector output in Nigeria but rather short run instruments.

IV. METHODOLOGY

In conducting the research secondary data obtained from Central Bank of Nigeria Statistical Bulletin from 2000 to 2020 was used in the study while Vector Autoregressive Estimates was used to analysis the data. The study adopted and modified the model of Afolabi et al (2018) who investigated the relationship between monetary policy instruments and Deposit Money Banks' Loans and Advances in Nigeria.

Their model is stated thus:

Bcr = f(M2,MPR,LR,CRR,INF,Structural change)
BCR=Bank credit to private sector
M2= Money supply
CRR= Cash reserve ratio
LR=Liquidity ratio
Inf=Inflation
MPR= Monetary policy rate
Dummy =Structural change

The model was adapted and modified by bringing in total loans and advances, loan to deposit ratio in the model while removing money supply, inflation and dummy variable. Deposit money banks total loans and advances was introduced to capture deposit money banks' lending in the economy. In order to capture the core monetary policy variable in Nigeria MPR, LQR and CRR was used while LDR was introduced to show banks ability to cover loan losses and withdrawals by its customers.

The model for the study is stated thus:

TLA=f(MPR, LQR,CRR,LDR)
$TLA= \beta_0+\beta_1 MPR+\beta_2 LQR+\beta_3 CRR+\beta_4 LDR+Ut$
$Log\ (TLA) = \beta_0+\beta_1 \log\ (MPR)+\beta_2\ \log(LQR)+\beta_3\ \log(CRR)+\beta_4\ (LDR)+Ut$
TLA=Total loans and advances
MPR= Monetary policy rate
LQR=Liquidity ratio
CRR=Cash reserve ratio
LDR= Loan to deposit ratio
$\int$ =Funtional Notation
μ_t = Error term
$\beta_0 - \beta_4$ =Coefficients of Estimates

A Priori Expectations

This refers to the supposed relationship between the dependent and independent variables of the model on the premise of the Keynesian theory. It shows the expected effects of the independent variables on the dependent variable. The expected relationship between the independent variables; Monetary policy rates and liquidity ratio is expected to have positive effects on dependent variable (TLA) while cash reserve ratio and loan to deposit ratio is expected to have negative effects on dependent variable.

V. RESULTS AND DISCUSSION

Table 1 was used to describe the variables of the study and it shows the summary of descriptive statistics used in the analysis. The mean value was shown to be 8382.675 for TLA, 12.50000 for MPR, 50.76179 for LQR, 11.90476 for CRR and 64.63821 for LDR. The median value was shown to be 7799.400 for TLA, 13.00000 for MPR, 50.20000 for LQR, 10.60000 for CRR and 64.34000 for LDR. The maximum and minimum of the series are 21373.49 and 508.3000 for TLA, 20.50000 and 6.000000 for MPR, 75.80000 and 30.40000 for LQR, 22.50000 and 1.000000 for CRR, 85.66000 and 37.97000 for LDR. The series standard deviations are 6399.164 for TLA, 3.249038 for MPR, 11.34259 for LQR, 7.925937 for CRR, 12.60689 for LDR.

Table 1. Descriptive Statistics

	Mean	Median	Maximum	Minimum	Std.Dev	Obs
TLA	8382.675	7799.400	21373.49	508.3000	6399.164	21
MPR	12.50000	13.00000	20.50000	6.000000	3.249038	21
LQR	50.76179	50.20000	75.80000	30.40000	11.34259	21
CRR	11.90476	10.60000	22.50000	1.000000	7.925937	21
LDR	64.63821	64.34000	85.66000	37.97000	12.60689	21

Source: Output Data from E-views 10.0

The variables for the analysis were subjected to unit roots test to determine whether there are unit roots or stationary series. In conducting this test, the Augmented Dickey-Fuller (ADF) unit root test with intercept would be employed to determine the stationarity of data. The unit root text from table 2 to table 4 shows that the variables are stationary at first difference and second difference which allow for ascertaining the cointegration relationship.

Table 2: Result of ADF Unit Root Test at level

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Remark
TLA	1.018715 (0.9950)	-3.808546	-3.020686	Not Stationary
MPR	-1.909749 (0.3214)	-3.808546	-3.020686	Not Stationary
LQR	-2.003206 (0.2831)	-3.808546	-3.020686	Not Stationary
CRR	-0.615970 (0.8460)	-3.808546	-3.020686	Not Stationary
LDR	-2.328836 (0.1732)	-3.808546	-3.020686	Not Stationary

Source: Author's Computation

Table 3: Result of ADF Unit Root Test at 1ST Diff

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Remark
TLA	-2.773666 (0.0808)	-3.831511	-3.029970	Not Stationary
MPR	-5.822865 (0.0002)**	-3.831511	-3.029970	Stationary
LQR	-4.373942 (0.0032)**	-3.831511	-3.029970	Stationary
CRR	-4.287638 (0.0039)**	-3.831511	-3.029970	Stationary
LDR	-3.483368 (0.0204)**	-3.831511	-3.029970	Stationary

Source: Author's Computation

Table 4: Result of ADF Unit Root Test at 2nd Diff

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Remark
TLA	-4.622010 (0.0021)**	-3.857386	-3.040391	Stationary
MPR	-7.392413 (0.0000)**	-3.857386	-3.040391	Stationary
LQR	-6.310497 (0.0001)**	-3.857386	-3.040391	Stationary
CRR	-7.695565 (0.0000)**	-3.857386	-3.040391	Stationary
LDR	-5.532583 (0.0003)**	-3.857386	-3.040391	Stationary

Source: Author's Computation

The unit root text in Table 2-4 which shows that the variables are stationary at first difference and second difference implies that Vector Autoregressive Estimates will be used to analyse the variables.

Table 5. Presentation of Johansen co-integration result

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.851291	97.05043	69.81889	0.0001
At most 1 *	0.694398	60.84090	47.85613	0.0019
At most 2 *	0.662915	38.31691	29.79707	0.0041
At most 3 *	0.517865	17.65591	15.49471	0.0233
At most 4	0.181046	3.794815	3.841466	0.0514
Trace test indicates 4 cointegrating eqn(s) at the 0.05 level				
* denotes rejection of the hypothesis at the 0.05 level				
**MacKinnon-Haug-Michelis (1999) p-values				

The co-integration test is used in the determination of the long-run relationship that exists between variables. Table 5 shows that long-run relationship (co-integration) exists among the variables. There is four cointegrating equation which is TLA, MPR, LQR and CRR in the model. This is reflected in the trace statistic of Table 5 which shows a value greater than that of the 5% critical value respectively. With the existence of long run relationship, there is need to analyze normalized long run coefficients based on Johansen test. The result of the normalized coefficients shown in Table 6 shows a long-run effect between monetary policy and performance of deposit money banks in Nigeria.

Table 6. Normalized long-run coefficient based on Johansen test

Dependent variable TLA				
TLA	MPR	LQR	CRR	LDR
1.000000	4718.026	-3081.779	1370.538	-1466.622
	(1098.81)	(403.636)	(424.481)	(256.072)
	[4.294]	[-7.6351]	[3.2288]	[-5.7275]

Source: Output Data from E-views 10.0

Note: Standard errors in ( ) and t- statistic in [ ].** implies significant at 1% level of significant. In long run monetary policy rate and cash reserve ratio have negative effect on total loans and advances of deposit money banks while liquidity ratio and loan to deposit ratio have positive effect total loans and advances of deposit money banks. The coefficients of MPR, LQR, CRR and LDR are statistically significant at the 1% level. Conclusion: The null hypothesis of no cointegration is rejected against the alternative of cointegrating relationship in the model. The nonstationary of data series and the cointegration of the vector variable in the equations lead to the execution of the second phase of Vector Autoregression Estimates (VAR).

Diagnostic Test

Normality Test The normality test was done using the Jarque-Bera Normality test, which requires that for a series to be

normally distributed; the Jarque-Bera statistics would not be significant.

Table 7 Normality Test

Component	Jarque-Bera	df	Prob.
1	2.731873	2	0.2551
2	1.436636	2	0.4876
3	3.022638	2	0.2206
4	4.660314	2	0.0973
5	0.277061	2	0.8706
Joint	12.12852	10	0.2765

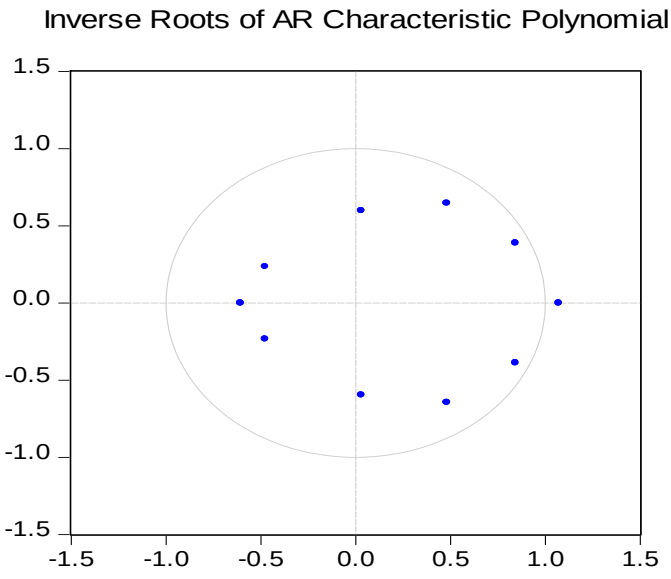
Source: Output Data from E-views 10.0

Normality test in Table 8 shows that the probability value for each of the variables TLA, MPR, LQR, CRR and LDR are 0.2551,0.4876,0.2206,0.0973 and 0.8706 are greater than 5% level of significant which indicates that the variables are normally distributed. Also, jointly or when all the variables are combined together the probability value is 0.2765 which indicates that all the variables are normally distributed.

Stability Test

The stability of the VAR model was investigated using the inverse roots of AR characteristic polynomial presented in figure 1.

Figure 1: Inverse Root of AR Characteristics Polynomia



Source: Graphs Using E-view Statistical Package, Version 10

The result shows that the VAR is relatively stable since all dots are within the circle except one. The reverse would be the case if the dots lie outside of the circled region.

Short Run Relationship

Table 9: Results of Vector Autoregressive Estimates Normalised on TLA

Parameters	Coefficient	Standard Error	t-statistic
TLA(-1)	0.621636	0.37362	1.66383
MPR(-1)	-476.3863	-2.03536	-2.03536
LQR(-1)	184.4864	79.7660	2.31284
CRR(-1)	225.7307	211.298	1.06830
LDR(-1)	44.17723	66.4082	0.66524
C	2649.397	3616.66	0.73255

Source: Output Data from E-views 10.0

Adjusted R-squared = 0.973 F-Statistic = 66.95388

The result from Table 9 shows that TLA, LQR, CRR and LDR have positive effect on TLA while MPR has negative effect on TLA. A one percent change in one-year lag of TLA, LQR, CRR and LDR will results to a positive change in TLA by 0.62 percent, 184.4 percent, 225.7 percent, and 44.1 percent respectively. On the other hand, a one percent change in one-year lag of MPR will results to negative change in TLA by 476.3863percent. On the performance of the individual variables, the results reveal that only one-year lag of MPR and LQR are statistically significant given the high values of their t-statistics.

The adjusted R-squared value of 0.973% indicates that, about 97.3% of the variations in TLA is explained by the combined effect of the independent variables. It also implies that the model has good fit in explaining the relationship. Similarly, the F-statistic which measures the overall significance of the model showed a high value of 66.95 which indicates that the effect of monetary policy on deposit money banks lending is statistically significant in Nigeria.

Table 10 Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
MPR does not Granger Cause TLA	19	0.20270	0.8189
TLA does not Granger Cause MPR		4.33382	0.0343
LQR does not Granger Cause TLA	19	6.92648	0.0081
TLA does not Granger Cause LQR		5.68958	0.0155
CRR does not Granger Cause TLA	19	0.74954	0.4906
TLA does not Granger Cause CRR		2.42248	0.1249
LDR does not Granger Cause TLA	19	3.08061	0.0779
TLA does not Granger Cause LDR		2.42257	0.1249

Source: Output Data from E-views 10.0

Granger causality text in table 10 indicates that there is unidirectional relationship between Total loans and advances of deposit money banks and monetary policy rate. The table also shows a bi-directional between Total loans and advances of deposit money banks and liquidity ratio thus indicating that

monetary policy affects the lending capacity of deposit money banks in Nigeria. This goes to show the need for monetary authorities to maintain a low and stable interest rate that will help bank lending.

VI. CONCLUSION AND POLICY IMPLICATION

Monetary policy has been defined as a policy employed by Central Bank in the control of money supply as well as achieving the objectives of general economic policy, such as full employment, domestic price stability, adequate economic growth and external sector stability. The control of money supply through the use of monetary policy tends to affect the lending capacity of the deposit money banks and various researches on this topic were conflicting. This necessitated the researcher to embark on this study on monetary policy and bank lending in Nigeria from 2000 to 2020. In order to achieve the objective of the study, the data collected were describe through the use of descriptive statistics. Thereafter unit root test was conducted and it was discovered to be integrated at level, first difference and second difference which imply that Vector Autoregressive Estimates (VAR) models will be used in the analysis. The result of the analysis indicates that monetary policy has negative and significant effect on bank lending. These tend to match the prior expectation of the researcher. The negative relationship indicates that an increase in monetary policy would result to a decrease in the total loan and advance and vice versa. These findings tend to disagree with the findings of Dare and Okeya,2017; Onodugo et al,2013;who found monetary policy rate to have a statistically insignificant relationship with return on asset of commercial banks but tend to agree with the find of (Afolabi et al,2018; Jegede ,2014; Akanbi and Ajagbe,2012; Okorafor;2010; Ekpung, Udude and Uwalaka ,2015)who found that monetary policy have a significant relationship with loan and advances of deposit money banks. The study also agrees with the Keynesian theory that interest rate affects investment in the economy and is on this that the study was anchored on Keynesian theory. Since the result of the study confirmed that monetary policy has a significant relationship with total loans and advances, which implies that monetary policy is a true parameter of measuring total loans and advance of deposit money banks. The study therefore recommends that monetary authority should strive to maintain a reasonable interest rate that will tends to reduce cost of borrowing and lending in the economy. There is need to strengthen bank loan and advance and monetary policy through effective and efficient regulation and supervisory framework. Government should through the Central Bank of Nigeria ensure working monetary policy instrument and make a periodic review of the polices in a way that will encourage bank lending. Monetary authority should manage the lending rate properly for it to be attractive and affordable for investors to borrow money from the bank. In conclusion, monetary policy rate, liquidity ratio, cash reserve ratio and loan to deposit ratio should be looked into by monetary authority in a way that is friendly to loan advancement especially relating to those who are in need of it. Finally, monetary policy should not be used in isolation but in collaboration with fiscal policy.

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