

Central Bank Policy and Private Sector Funding in Nigeria: A Multi-Variant Study.

Adolphus A. Toby
Department of Banking & Finance, Faculty of Management Sciences
Rivers State University. Port Harcourt

&
Alexander Sulaiman Zaagha
zaagha@gmail.com

Abstract

This study examined the effect of Central Bank policy rates on private sector funding in Nigeria. The purpose of the study was to examine the extent to which monetary policy affect private sector funding in Nigeria. Time series data were sourced from Central Bank of Nigeria Statistical Bulletin from 1985-2018. Credit to private sector, credit to core private sector and credit to small and medium scale enterprises sector were used as dependent variables while monetary policy rate, treasury bill rate, cash reserve ratio as independent variables. The study employed multiple regression models to estimate the relationship that exists between monetary transmission channels and private sector funding in Nigeria. Ordinary Least Square (OLS), Augmented Dickey Fuller Test, Johansen Co-integration test, normalized co-integrating equations, parsimonious vector error correction model and pair-wise causality tests were used to conduct the investigations and analysis. The empirical findings revealed that Central bank policy rates explain 64 percent and 59.9 percent of the variation in credit to private sector and credit to core private sector within the model and 18.5 percent of the variation in bank lending to small and medium scale enterprises sector. The study concludes that Central Bank Policy rates has significant relationship with credit to private sector, credit to core private sector and no significant relationship with credit to small and medium scale enterprise sector. The study recommends the need for monetary authorities to stabilize Central bank policy rates and deposit money banks should reduce lending rate to encourage investment borrowings.

Keywords: Central Bank Rate, Deposit Money Banks Rate, Private Sector Funding

Introduction

The policy thrust of the Nigerian monetary authorities in the past three decades has been to increase the operational effectiveness of monetary policy, enhance financial sector deepening and channel fund to the private sector for the realization of macroeconomic goals. In a developing country like Nigeria, the debate on the effectiveness of monetary policy has been a point of departure among scholars (Omoke and Adesoye, 2012). Cornerstone of neoclassical monetary policy is based on the tenets of classical theory which assumes perfect competition, use of real variables in decision making and application of representative agent models with agents that have the same preferences and act alike in every way. In Nigeria, private sector development is hindered by poor policy choices, weak institutional and governance structural systems, ill timing of monetary policy framework and policy inconsistency. The challenge lies in designing strong value-oriented institutions and defining monetary policies that foster the development of financial intermediaries (inclusion) and provide access to basic financial services to private investors. However, availability of credit determines the ability of firms to accumulate capital and hire labor. Thus, credit contraction causes a decline in capacity utilization, employment, and production services. Tight monetary policy, which is usually associated with high interest rates and a strong currency, particularly hurts export-oriented sectors by undermining international competitiveness (Soyibo & Adekanye, 2017). The decline in production and exports causes upward pressure on the price level and deteriorates the current account, causing inflation to accelerate (Omoke & Adesoye, 2002). The increases in the price level results in a decline in real credit, which affect investment and employment negatively while these supply effects are significant, contractionary monetary policy, fail to reduce and contain inflation. The pro-cyclical relationship between monetary policies

and private sector funding can be illustrated through the credit channel which states that monetary policy works by affecting bank assets (loans) as well as banks' liabilities (deposits). The key point is that monetary policy besides shifting the supply of deposits also shifts the supply of bank loans. For instance, an expansionary monetary policy that increases bank reserves and bank deposits increase the quantity of bank loans available. Where many borrowers are dependent on bank loans to finance their activities, this increase in bank loans will cause a rise in investment (and also consumer) spending, leading ultimately to an increase in aggregate output. When monetary policy tightens, the reduction in available bank reserves forces banks to create fewer reservable deposits, banks must then either replace the lost reservable deposits with non-reservable liabilities, or shrink their assets, such as loans and securities, in order to keep total assets in line with the reduced volume of liabilities. The effect of monetary policy has well been examined; however, there are three strands of studies on the effect of monetary policy. The first strands focused on the effect of monetary policy on economic growth (Adefeso and Mobolaji, 2010; Adofu, Abula and Audu, 2010; Amassoma, Nwosa and Olaiya, 2011, Nasko, 2016, Karimo and Ogbonna, 2017). The second strand focused on monetary policy on banking sector performance (Alper and Anbar, 2011; Enyioko, 2012; Okoye, and Eze, 2013, Udeh, 2015, Ogolo and Tamunotonye, 2019, Ayub and Seyed, 2016 and Jegede, 2014) while the third strand focused on monetary policy and capital market performance (Akani, 2017). These studies failed to establish the effect of Central Bank Policy on private sector funding. From the above problems and knowledge gap, this study empirically examined the effect of CBN monetary policy on private sector funding in Nigeria.

Central Bank Policy Rates

Central bank rates are monetary policy instruments used by the Central Bank to influence the lending operations of the deposit money banks which include the following:

Cash Reserve Ratio

This regulation requires each commercial bank to maintain minimum cash reserves to customer's deposits and notes. All commercial banks hold some percentage of deposits at the national bank. The Federal funds are reserves held in a bank's account with its Central Bank (McGraw-Hill, 1951). The underlying principle of cash requirement is to maintain bank from its liquidity, i.e. when losses occur on a bank's loans the amount lost is first covered from profits then from regulatory capital. If these are not sufficient, bank failure and loss of bank deposits can occur. Reserve requirement ratios vary across different types of deposits. Reserve requirement measured as weighted average of all reserve requirements and Effective Reserve Requirements Robitaille (2011), Banco (2011) and Terrier et al. (2011). Small banks are partly exempted from reserve requirement regulation. An exemption entry exists on a variety of deposits above which compulsory reserve requirements apply. If a bank's deposit volume is below the exemption value, the reserve requirement regulation becomes obsolete. Banks required amount of reserves equals to the required reserve ratio times the total deposits in the bank (Case and Fair, 2007). The precise determination of which bank liabilities to include in reserve base has more significant implication for monetary control and resources allocation than for bank liquidity rather than the reserve requirement based on the bank asset has tended to affect more on the allocation of credit (Coasts, 1980). Required reserve is a measure of required reserves/assets which is a ratio of legally required reserves relative to total assets. Required reserve equals to legal required reserve/total asset (Charles et al, 2011)

Monetary Policy Rate

Monetary Policy Rate (MPR) is the rate which central banks lend to Deposit Money Banks in performing their duties as lenders of last resort. It is usually set at a level that is consistent with the objective of price stability of central banks. The monetary policy rate is expected to communicate the stance of monetary policy and acts as a guide for all other market interest rates (CBN 2016). The monetary policy rate is used as a monetary authority policy tool that defines the focal point of a standing facility meant to steer market interest rates. While the upper bound corridor of the monetary policy rate represents monetary authority (CBN) lending rate to deposit money banks, the lower bound corridor represent the deposit rate at which the monetary authority (CBN) accepts deposits from deposit money banks under the Standing Lending Facility (SLF) and Standing Deposit Facility (SDF) of the central bank.

There is general agreement among economists and policymakers that monetary policy works mainly through interest rates. When the central bank policy is tightened through a decrease in reserve provision, for instance, interest rates rise. Interest rate rise means that the banks have to adjust their lending rates upwards. The rise in interest rates leads to a reduction in spending by interest sensitive sectors of the economy, such as housing and consumer purchases of durable goods. Therefore, the cost of credit becomes high and in most cases becomes unaffordable reducing demand for credit. Some economists and policymakers have argued that an additional policy channel works through bank credit (Keeton, 1979; Stiglitz and Weiss, 2001). In this view, monetary policy directly constrains the ability of banks to make new loans, making credit less available to borrowers who depend on bank financing. Thus, in the credit channel, restrictive monetary policy works not only by raising interest rates, but also by directly restricting bank credit.

Treasury Bill Rate

Nigerian Treasury Bills (NTB) are short-term debt instruments that mature in one year or less and are issued by the CBN on behalf of the Federal Government, to raise surplus funds from both banks and non-bank publics. Rufino (2008) defined Treasury Bills as short term instruments issued by the government under varying tenor to finance its operations. Treasury bills are basically government own and guaranteed debt instruments issued by the monetary authority of a country to control money supply (CBN 2016). Treasury Bills are securitized government debt securities used to finance deficit budget and features as a veritable tool in the liquidity management. Treasury bills in Nigeria are governed by the Treasury Bills ordinance of 1959 and were first issued in April 1960. The bills become the first major money market instruments issued by the CBN in April 1960 and were issued in fixed tenors of 91 days, 182 days and 364 days. Treasury bills are issued (auctions) in different denominations to potential investors via authorized dealers. Treasury bills are issued in bear form and are negotiable.

Treasury Bills Rate is the interest rate paid by government to investors who purchase government bills or monetary authorities. Since treasury bills are discount instruments, rather than making interest, they are issued at a discount to the face value and mature at face value. The interest rate is a function of the purchase price, the face value, and the time remaining till maturity (CBN 2016)

Private Sector Funding

The private sector is said to be the engine of economic growth for a country, especially, for developing economies (William et al. 2019). The private sector remains the nucleus that drives economic growth. Private sector funding (credit) is no doubt a driver of the real

economy, particularly in developing economies like Nigeria where the financial markets are porous and near well developed to mobilize the needed resources to accelerate the desired level of economic development. The private sector is the part of the economy that is run by individuals and companies for profit and is not state controlled. Therefore, it encompasses all for-profit businesses that are not owned or operated by the government. Private sector funding refers to various sources through which the private investor and SMEs can have easy access to fund to finance their businesses. Private sector in Nigeria is expected to raise funds from two main sources: Equity and debt. The sources of equity (sometimes called internal funds) include owners' savings and ploughed back profits. Often times, firms make use of debt (external funds) for expansion. These funds can be obtained from informal sources (that is friends/relatives, credit associations, co-operative societies) and also from formal sources (that is banks and governmental agencies). The availability of credit is essential in driving economic and monetary policies transmission and enable SMEs/private firms and households to finance business investments and consumption spending. A low rate of credit expansion is not only a symptom of weak economic growth, but can also be one of its causes. Thus channeling additional financial resources to strategic business areas, such as the private sector/SMEs, is essential in poverty eradication and promoting economic growth in emerging and developing economies (Fountas et al. 2006; Bundesbank 2005 cited in Katusiime 2018). As a vital engine for economic growth in developing economies, the private sector relies on the financial sector as a source of funds in advancing growth (Katusiime 2018).

Funding Small and Medium Scale Enterprises Sector in Nigeria

In Nigeria, the national policy on micro, small and medium enterprises define SMEs along the lines of international criteria. The policy mainly uses the employment base and asset size to categorize firms into micro, small and medium. Accordingly, for small-scale enterprises, the employment base should be between 10 and 49 with an asset base of over N5 million but less than N50 million. Medium scale enterprises are those that employ between 50 and 199 workers, with an asset base of over N50 million but less than N500 million. Importantly, the assets admitted for these classifications exclude land and buildings. Also, in case of conflict of classification between employment and asset size, the policy gives pre-eminence to the number of employees over asset size. Bank credit refers to loans, advances and discounts of specific sums, which are normally with terms and other conditions available to individuals, small and medium sized business to start, grow or sustain any economic activity (John and Onwubiko, 2013). Funding of SMEs Sector refers to credit extended to small and medium scale enterprises basically through the financial institutions. It is captured as annual loans and advances disbursed from the financial institutions in Nigeria to SMEs. The CBN statistical bulletin reports credit to small and medium scale enterprises as percentage of total credits in the economy.

Keynesian Liquidity Preference Theory

Keynesian monetary economics revolves around the liquidity preference theory - Keynesian demand for money introduced in the monetary sector (Belke & Polleit, 2009). This liquidity preference theory is one of the hallmarks that differentiate Keynesian monetary theory from the general family of neo-classical theories. It explains why people individually express demands for money; the motives for money as liquid asset (Lewis & Mizen, 2000). In this theory, the demand for money is determined by interactions between income and interest rate, that is, the price of demand. Thus, Keynesians argued that, to influence the demand for money, we should either control directly the price for money or indirectly by inducing changes through real income. Theoretically, a change in interest rate, other things being equal, affects individual preferences for holding liquid (cash) and illiquid assets. Keynesians recognize the importance of the role of money, because it is “first and foremost a financial asset (Lewis & Mizen, 2000). Money does not affect only the absolute price and quantity of trade, but it affects also the level of financial intermediation, stock prices, and its’ own price -interest rates- (Knoop, 2008). Although there is a clear recognition for active roles of money in the money market, Keynesians assume that money is exogenous.

The Loanable Funds Theory

The neo-classical or the loanable fund theory examines interest rate in terms of demand and supply of loanable funds or credit. According to this theory, the rate of interest is the price of credit which is determined by the demand and supply for loanable funds. In the words of Prof Lerner in Jhingan (1992); it is the price which equates the supply of credit, or saving plus the net increase in the amount of money in a period, to the demand for credit, or investment plus net hoarding in the period. The demand for loanable fund has primarily three source; government, businessmen and consumers who need them for purpose of investment, hoarding and consumption. The government borrows funds for constructing public works or for war preparations. The businessmen borrow for the purpose of capital goods and for starting investment projects. Such borrowings are interest elastic and depend mostly on the expected rate of profit as compared with the interest rates. The demand of loanable fund on the part of consumers is for the purchase of durable consumer goods like scooters, houses etc. Individual borrowings are also interest elastic. The tendency to borrow is more at a lower rate of interest than at a higher rate. Loanable funds theory of interest rate determination views the level of interest in the financial market as resulting from the factors that affect the supply and demand of loanable funds (Saunders 2010). Interest rate in this theory is determined just like the demand and supply of goods is determined, supply of loanable funds increases as interest increases, other factors held constant. He goes further to explain that the demand for loanable funds is higher as interest rate fall, other factors held constant. Saunders (2010) identifies two factors among others causing demand curve for loanable funds to shift; economic conditions and the monetary expansion refers to the sum of money offered for lending and demanded by consumers and investors during a given period. The interest rate model is determined by the interaction between potential borrowers and potential savers.

Credit Rationing Theory

Access to credit is explained by credit rationing theory (Stiglitz and Weiss, 1981; Bester, 1985; Cressy, 1996; Baltensperger and Devinney, 1985). According to Stiglitz and Weiss (1981) credit rationing is said to occur when some borrowers receive a loan, while others do not. Credit rationing takes place at either financier level due to loan markets imperfection and information asymmetry or voluntarily by the borrowers (voluntary exclusion). At financier level, credit rationing occurs in a situation where demand for credit exceeds supply at the prevailing interest rate (Stiglitz and Weiss, 1981). There is scant literature on self-rationing, however, in situations

where credit rationing is voluntary, Arora (2014) describes such borrowers as non-credit seekers due to personal, culture or social reasons or could be in the bracket of discouraged borrowers. Bester (1985) suggested that financiers may choose to reject some borrowers because of negative enticement effects. For example, for given collateral, an increase in the rate of interest causes adverse selection, since only borrowers with riskier investments will apply for a loan at a higher interest rate. Similarly, higher interest payments create an incentive for investors to choose projects with a higher probability of bankruptcy (Afonso and Aubyn, 1997, 1998; Matthews and Thompson, 2014). On the other hand, for a fixed rate of interest, an increase in collateral requirements may also result in a decline in the lender's profits (Cressy, 1996). Stiglitz and Weiss (1981) showed that this happens if the more risk-averse borrowers, those that choose relatively safe investment projects, drop out of the market. According to Bester (1985) Andretti (1983), if financiers set collateral requirements and the rate of interest to screen investors' riskiness, then no credit rationing will occur at equilibrium. This is because increasing collateral requirements tends to result in adverse selection, even with risk-neutral investors (Bester, 1984a, 1985).

Empirical Review

Anigbogu, Okoli and Nwakoby (2015) investigated the effect of financial intermediation on small and medium enterprises performance in Nigeria between 1980-2013. Using an econometric model of the Ordinary Least Square (OLS). Findings revealed that with the exception of bank interest rate to SMEs, all other variables namely bank lending rate to SMEs, exchange rate and monetary policy have a positive and significant influence on small and medium enterprises performance in Nigeria. Ovat (2016) examined the role played by commercial banks' credit in facilitating the growth of SMEs in Nigeria. The study adopted co-integration and error correction mechanisms and based on the findings, exchange rate and lending rate are statistically significant to SMEs credit. Also, inflation rate was found to be significant but negative to SMEs credit. He opined that SMEs should be made to have easy access to credits from commercial banks. In order to achieve this, the monetary authority should ensure that the lending rate at which commercial banks lend to the SMEs is reduced to the barest minimum. More so, devaluation of the national currency should not be encouraged as devaluation makes the cost of imported raw materials and capital goods used by the SMEs very expensive and hence impedes their production, rather local sourcing of raw materials should be encouraged to reduce the pressure on exchange rate. Ayub and Seyed (2016) in their study examine the relationship existing between monetary policy and bank lending behavior and the influence of bank specific features on this relationship in the banks listed on the 8 Tehran Stock Exchange. The study used Iran's bank loan aggregated series and bank's size and capital structure data. The study used the growth rate of M2 as the indicators of Iran's monetary policy. Using Vector error correction model (VECM) and quarterly data for the period 2007: Q1 to 2014: Q4. The results showed a bidirectional causal link between M2 and banks' lending behavior trading on the Tehran Stock Exchange. It was also observed that the banks' capital structure as one of the banks specific feature variables have a negative impact on bank lending behavior in accepted banks in Tehran Stock Exchange. D'Pola, and Touk, (2016) empirically examine the impact of commercial bank credit on the performance of Small and Medium Size Enterprises (SMEs) in Cameroon between 1980 and 2014 using Ordinary Least Square (OLS) method to estimate the multiple regression model. The study use SMEs output as approximated by wholesale and retail trade output as a component of the GDP. The results revealed that commercial bank credit and real interest rate have a negative and significant impact on the performance of SMEs in Cameroon. Sesay and Abdulai (2017) empirically investigate monetary policy effects on private sector investment in Sierra Leone. The study examines

the rate at which changes in monetary policy in Sierra Leone has affected the behavior of private sector investments, theories and empirical studies are reviewed in a way to identify a suitable model for private sector investment for the period 1980-2014 using recent econometric techniques (OLS, VECM, VAR). Results of the findings suggest that money supply and gross domestic saving exert positive and statistically significant effect on private sector investments whereas Treasury bill rate, inflation and gross domestic debt exert a negative effect. An important policy implication emerging from this study is to facilitate the establishment of financial institutions to increase credit delivery to the private sector so as to enhance private investment. João, Barroso and Gonzalez (2017) estimated the impact of reserve requirements (RR) on credit supply in Brazil exploring a large loan-level dataset. The authors used a difference-in-difference strategy, first in a long panel, then in a cross-section. In the first case, they estimate the average effect on credit supply of several changes in RR from 2008 to 2015 using a macro prudential policy index. In the second, they use the bank-specific regulatory change to estimate credit supply responses from (1) a countercyclical easing policy implemented to alleviate a credit crunch in the aftermath of the 2008 global crisis; and (2) from its related tightening, findings show evidence of a lending channel where more liquid banks mitigate RR policy. Exploring the two phases of countercyclical policy, they found that the easing impacted the lending channel on average two times more than the tightening. Foreign and small banks mitigate these effects and banks are prone to lend less to riskier firms. Karimo and Ogbonna (2017) examined the direction of causality between financial deepening and economic growth in Nigeria for the period 1970–2013. They adopted the Toda–Yamamoto augmented Granger causality test and results revealed that the growth-financial deepening nexus in Nigeria follows the supply-leading hypothesis. This implies that financial deepening leads to growth and not growth leading financial deepening and recommends that policy efforts should be geared towards removing obstacles that undermine the growth of credit to the private sector in Nigeria.

Echekoba and Ubesie (2018) did an assessment of financial deepening on the growth of Nigerian -economy 1990-2016 using ordinary least square regression (OLS). The main objective of this study is to evaluate the effect of private sector credit, money supply and market capitalization on economic growth in Nigeria. Findings showed that the three independent variables of the study all have significant effect on Nigerian financial deepening. It was therefore recommended that policies aimed to reduce the high incidence of non-performing credits to ensure that private sector credits are channel to the real sector of the economy. The monetary authorities should implement policies that increase the flow of investible funds and improves the capacity of banks to extend credit to the economy as this will make broad money supply and private sector, to significantly impact on economic growth in Nigeria. Adelegan, (2018) examines the dynamic linkages between domestic investment, domestic credit to the private sector and gross domestic product (GDP) in Nigeria over the period of 1970 to 2015. The Vector Autoregressive (VAR) model, its accessories of impulse response functions (IRFs) and variance decomposition composition (VDC) were use. Findings indicate that the relationship between growth and domestic credit to the private sector is positive and insignificant. Also, the results show that increase in PLR reduces output for the period under study, but this was not statistically significant. In addition, the relationship between PDI and PDI is positive but statistically insignificant. Finally, the negative relationship between exchange rate and private domestic investment suggests that the appreciation of the real exchange rate discourages domestic private investment. Adeniyi et al. (2018) investigated the relationship that exists between monetary policy

instruments and Deposit Money Banks Loans and Advances in Nigeria. Annual time series data covering a period from 1981-2016 were used and the Toda and Yamamoto granger non-causality model was employed to examine the relationship existing between Deposit Money Banks loan and advances and monetary policy variables in Nigeria. 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. Other explanatory variables (broad money supply, liquidity ratio, inflation rate and cash reserve ratio does not granger cause loan and advances of Deposit Money Banks in Nigeria within the study period. It concluded that the structural change in monetary policy system and monetary policy rate have significant impact on loan and advances of deposit money banks in Nigeria. Ogolo and Tamunotonye (2018) empirically examined the effects of monetary policy on commercial banks' lending to the real sector from 1981 – 2014 using multiple regression models aided by Software Package for Social Sciences. The study modeled commercial banks credit to agricultural and manufacturing sector as the function of interest rate, monetary policy rate, treasury bill rate, exchange rate, broad money supply and liquidity ratio. The regression results from model one found that interest rate, monetary policy rate have positive relationship with commercial banks' lending to the agricultural sector while Treasury bill rate, exchange rate, broad money supply and liquidity ratio have negative effect on the dependent variable. Model two found that interest rate, Treasury bill rate, exchange rate, broad money supply and liquidity ratio have negative effect on commercial banks' lending the manufacturing sector while monetary policy rate have positive relationship with the dependent variable.

William, Zehou, and Hazimi (2019) investigated the factors that influence domestic credit to the private sector in Ghana. The study uses the Johansen cointegration and vector auto-regression model to analyze panel data spanning the period from 1961 to 2016. Findings from the study revealed that though there is no long-run association among the variables, there exist significant short-run relationship between domestic credit to the private sector, broad money and gross capital formation. Further diagnostic tests showed that gross capital formation Granger causes both domestic credit to the private sector and broad money, and domestic credit to the private sector Granger-causes broad money. They concluded that money supply and gross capital formation are necessary factors to address in the quest for developing the financial strength of domestic banks in providing credit facilities to the private sector for economic growth. Courage and Leonard (2019) examined the effect of commercial bank sectorial credit to the manufacturing and agricultural sub-sectors on economic growth in Nigeria with time series data from 1981 to 2015, using co-integration and error correction mechanism. The study specifies a three equation model to analyze the variables which include; real GDP, bank sectorial credit to manufacturing and agriculture subsectors, monetary policy rate, financial market development, sourced from CBN statistical bulletin and also the interaction variables, Empirical result revealed that commercial bank credit to the manufacturing and agricultural subsectors significantly affects economic growth in Nigeria both in the short run and in the long run. Furthermore, development of the financial sector enhances the growth effects of commercial banks credit to the manufacturing and agricultural subsectors of the economy.

Ubesie et al. (2019) study the effect of sectoral allocation of deposit money banks' credit on the growth of the Nigerian real economy from 2008Q1 to 2017Q4 using the Ordinary Least Square (OLS) regression technique. Result of the analysis revealed that deposit money

banks' credit to agriculture, industries, building & construction and wholesale & retail trade have no significant effect on agricultural, industrial, building & construction and wholesale & retail trade contribution to real gross domestic product. Deposit money banks should remove the disparagement that the agricultural sector is not viable, and lend to farmers with genuine needs for funds at a low interest rate. The Central Bank of Nigeria can equally play a critical role in reducing the interest rate charged by deposit money banks in extending credit to the economy by cutting down the monetary policy rate to a single digit compared to the current double digit of 14%. Olorunmade, Samuel, and Adewole, (2019) examined the determinant of private sector credit and its implication on economic growth in Nigeria. The fluctuation in the supply of money and credit is the basic causal factor at work in cyclical process; when money supply falls, prices decrease, profit decrease, production activities become sluggish and production falls and when money supply expands, price rise, profit increase and the total output increases and finally growth takes place. Sample regression analysis were used to analyse data obtained from Central Bank of Nigeria statistical bulletin from 2000 to 2017. It was revealed in the determinant of credit supply that there was significant relationship between Total credits to private sector and money supply in Nigeria. The study also finds that there was significant relationship between private sector credit and economic growth in Nigeria.

Literature Gap

Zuzana, Riikka and Laurent (2015) examined how reserve requirements influence the transmission of monetary policy through the bank lending channel in China while also taking into account the role of bank ownership. Gap and Focus of Present Study: The above study is a foreign study and does not capture the effect of monetary policy on private sector funding, further the study only examined how monetary policy affect bank behavior of private investment. The present study will be carried out in Nigeria and focus on the effect of monetary policy on private sector funding in Nigeria. João, Barroso and Gonzalez (2017) estimated the impact of reserve requirements (RR) on credit supply in Brazil, exploring a large loan-level dataset. The authors used a difference-in-difference strategy, first in a long panel, then in a cross-section. Gap and Focus of Present Study: The above study is a foreign study and does not capture the effect of monetary policy on private sector funding, furthermore the study only examined how monetary policy affect bank behavior of private investment. The present study will be carried out in Nigeria and focus on the effect of central bank monetary policy on private sector funding in Nigeria.

Methodology

This study adopt the ex-post facto quasi-experimental research design to examine the effect of Central Bank Policy on private sector funding in Nigeria. This study employed secondary data sourced mainly from the Central Bank of Nigeria (CBN) statistical bulletin from 1985-2018.

Model Specification

The study models are specified below:

$$CPS = \alpha + \beta_1 MPR + \beta_2 TBR + \beta_3 CRR + \epsilon$$

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$$\begin{aligned} \text{CCPS} &= \alpha + \beta_1\text{MPR} + \beta_2\text{TBR} + \beta_3\text{CRR} + \text{et} & 2 \\ \text{SMES} &= \alpha + \beta_1\text{MPR} + \beta_2\text{TBR} + \beta_3\text{CRR} + \text{et} & 3 \end{aligned}$$

Where:

CPS	=	Credit to the Private Sector
CCPS	=	Core Credit to the Private Sector
CSMES	=	Credit to Small and Medium Scale Enterprises Sector
MPR	=	Monetary Policy Rate
TBR	=	Treasury Bill Rate
CRR	=	Cash Reserve Ratio
Et	=	Error Term

Techniques of Data Analysis

The main tool of analysis is the Ordinary Least Squares (OLS) using the multiple regression method for a period of 34 years, annual data covering 1985– 2018. Statistical evaluation of the global utility of the analytical model, so as to determine the reliability of the results obtained were carried out using the coefficient of correlation (r) of the regression, the coefficient of determination (r^2), the student T-test and F-test.

- (i) **Coefficient of Determination (r^2) Test:** This measure the explanatory power of the independent variables on the dependent variables. R^2 gives the proportion or percentage of the total variation in the dependent variable Y that is accounted for by the single explanatory variable X. The higher the R^2 value the better. For example, to determine the proportion of monetary policy to private sector funding in our model, we used the coefficient of determination. The coefficient of determination varies between 0.0 and 1.0. A coefficient of determination says 0.20 means that 20% of changes in the dependent variable are explained by the independent variable(s). Therefore, we shall use the R^2 to determine the extent to which variation in monetary policy variables are explained by variations in private sector funding variables over the periods covered in this study.
- (ii) **Correlation Co-Efficient (R):** This measures the degree of the relationship between two variables x and y in a regression equation. That is, it tries to establish the nature and magnitude of the relationship when two variables are been analyzed. Thus correlation co-efficient show whether two variables are positively or negatively correlated. That is, it takes the value ranging from – 1, to + 1.
- (iii) **F-Test:** This measures the overall significance. The extent to which the statistic of the coefficient of determination is statistically significant is measured by the F-test. The F-test can be done using the F-statistic or by the probability estimate. We use the F-statistic estimate for this analysis.
- (iv) **Student T-test:** measures the individual statistical significance of the estimated independent variables. This is a test of significance used to test the significance of regression coefficients (Gujurati, 2003). Generally speaking, the test of significance

approach is one of the methods used to test statistical hypothesis. A test of significance is a procedure by sample results are used to verify the truth or falsity of a null hypothesis (Ho) at 5% level of significance.

- (v) **Durbin Watson Statistics:** This measures the collinearity and autocorrelation between the variables in the time series. It is expected that a ratio of close to 2.00 is not auto correlated while ratio above 2.00 assumed the presence of autocorrelation.
- (vi) **Regression coefficient:** This measures the extent in which the independent variables affect the dependent variables in the study.
- (vii) **Probability ratio:** It measures also the extent in which the independent variables can explain change to the dependent variables given a percentage level of significant.

Stationarity (Unit Root) Tests

Stationary test therefore checks for the stationarity of the variables used in the models. If stationary at level, then it is integrated of order zero, I(0). Thus, test for stationarity is also called test for integration. It is also called unit root test. Stationarity denotes the non-existence of unit root. We shall therefore subject all the variables to unit root test using the augmented Dickey Fuller (ADF) test specified in Gujarati (2004) as follows.

$$\Delta y_t = \beta_1 + \beta_2 + \delta y_{t-1} + \alpha \sum_{i=1}^m \Delta y_{t-i} + E_t \tag{4}$$

Where:

- Δy_t = change time t
- Δy_{t-1} = the lagged value of the dependent variables
- \sum_i = White noise error term

If in the above $\delta = 0$, then we conclude that there is a unit root. Otherwise there is no unit root, meaning that it is stationary. The choice of lag will be determined by Akaike information criteria.

Co-integration Test (The Johansen' Test)

It has already been warned that the regression of a non-stationary time series on another non stationary time series may lead to a spurious regression. If the residual is found to be stationary at level, we conclude that the variables are co-integrated and as such has long-run relationship exists among them.

$$CPS_t = w_o + \sum_{i=1}^i \vartheta_i CPS_{t-i} + \sum_{i=1}^j \varpi_i CPS_{jt-i} + \mu_{1t} \quad 5$$

$$CCPS_t = w_o + \sum_{i=1}^i \vartheta_i CCPS_{t-i} + \sum_{i=1}^j \varpi_i CCPS_{jt-i} + \mu_{1t} \quad 6$$

$$SMEs_t = w_o + \sum_{i=1}^i \vartheta_i SMEs_{t-i} + \sum_{i=1}^j \varpi_i SMEs_{jt-i} + \mu_{1t} \quad 7$$

Granger Causality Test

Causality means the impact of one variable on another, in other-words; causality is when an independent variable causes changes in a dependent variable. The pair-wise granger causality test is mathematically expressed as:

$$Y_t \pi_o + \sum_{i=1}^n x_1^y Y_{t-1} \sum_{i=1}^n \pi_1^x x_{t-1} + u_1 \quad 8$$

and

$$x_t dp_o + \sum_{i=1}^n dp_1^y Y_{t-1} \sum_{i=1}^n dp_1^x x_{y-1} + V_1 \quad 9$$

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The null hypothesis $\pi_1^y = dp_1^y = 0$, for all I 's is tested against the alternative hypothesis $\pi_1^x \neq 0$ and $dp_1^y \neq 0$.if the co-efficient of π_1^x are statistically significant but that of dp_1^y are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of π_1^x and dp_1^y are significant then causality is bi – directional.

Vector Error Correction (VEC) Technique

The presence of co-integrating relationship forms the basis of the use of Vector Error Correction Model. E-views econometric software used for data analysis, implement vector Auto-regression (VAR)- based co-integration tests using the methodology developed by Johansen (1991,1995). The non-standard critical values are taken from (Osterward, 1992).

Results and Discussion of Findings

Table 1: Short Term Regression Results

Central Bank Rate and Credit To Private Sector				Central Bank Rate and Credit core To Private Sector			
Variable	Coefficient	t-test	Prob.	Variable	Coefficient	t-test	Prob.
CRR	0.429366	3.848899	0.0006	CRR	0.416065	3.431495	0.0018
MPR	-1.186304	-5.574702	0.0000	MPR	-1.197030	-5.175400	0.0000
TBR	0.218123	1.303472	0.2027	TBR	0.102838	0.565412	0.5761
C	20.94932	7.754349	0.0000	C	23.32678	7.944077	0.0000
R ²	0.640904			R ²	0.599266		
Adj R2	0.603756			Adj R2	0.557811		
F-Stat	17.25280			F-Stat	14.45575		
F-Prob	0.000001			F-Prob	0.000006		
DW	1.312661			DW	1.272747		

Source: Extract from E-view 9.0

To find out how well the model fits a set of observations, the R² indicates that 64 percent and 59.9 percent of the variation in credit to private sector and credit to the core private sector is explained within the model. Nonetheless, the R² cannot determine whether the coefficient estimates and predictions are biased, hence further assessment of the residuals are necessary. From the results it could be deduced that cash reserve ratio and treasury bill rates have positive effect on credit to private sectors while monetary policy rate has negative effect on credit to private sector. Furthermore, from the results it could also be deduced that cash reserve ratio and treasury bill rate have positive effect on credit to core private sectors while monetary policy rate has negative effect on credit to core private sector.

Table 2: Unit Root Test

Central Bank Rate and Credit To Private Sector				Central Bank Rate and Credit Core To Private Sector			
Variable	ADF	5%	Prob.	Variable	ADF	5%	Prob.
CPS	-6.020482	-2.967767	0.0000	CCPS	-9.705692	-2.960411	0.0000
CRR	-7.571396	-2.971853	0.0000	CRR	-7.571396	-2.971853	0.0000
MPR	-9.183031	-2.957110	0.0000	MPR	-9.183031	-2.957110	0.0000
TBR	-6.771525	-2.957110	0.0001	TBR	-6.771525	-2.957110	0.0000

Source: Extract from E-view 9.0

It can be seen from the table 2 above that the unit root test results, using the ADF unit root test suggest that all series are stationary at order I(1) because they become stationary after being differenced once. Therefore, the Engle and Granger (1987) can be employed.

Table 3: Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**	Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
Central Bank Rate and Credit To Private Sector					Central Bank Rate and Credit Core To Private Sector				
None *	0.584578	50.63784	47.85613	0.0268	None	0.559969	44.55319	47.85613	0.0988
At most 1	0.375858	24.28401	29.79707	0.1887	At most 1	0.347864	19.92585	29.79707	0.4279
At most 2	0.286317	10.14268	15.49471	0.2699	At most 2	0.208507	7.100786	15.49471	0.5659
At most 3	0.000773	0.023197	3.841466	0.8789	At most 3	0.002855	0.085759	3.841466	0.7696

Source: Extract from E-view 9.0

From table 3, the results of the Johansen co-integration test shows that we adopt the null hypotheses of no co-integrating equation at the 5% level of significance. This implies that, there is no linear combination of the variables that are stationary in the long run and also confirms the existence of a long-run relationship between monetary policy variables and credit to private sector and credit to core private sector.

Table 4: Error Correction Model

Central Bank Rate and Credit To Private Sector				Central Bank Rate and Credit core To Private Sector			
Variable	Coefficient	t-test	Prob.	Variable	Coefficient	t-test	Prob.
C	0.686955	1.563509	0.1388	C	0.821751	1.399314	0.1821
D(CPS(-1))	-0.025653	-0.101245	0.9207	D(CCPS(-1))	-0.211885	-0.735646	0.4733
D(CPS(-2))	-0.051473	-0.197154	0.8464	D(CCPS(-2))	-0.150884	-0.549345	0.5909
D(CPS(-3))	-0.520431	-1.956089	0.0693	D(CCPS(-3))	-0.354061	-1.218156	0.2420
D(CRR(-1))	0.274034	1.651143	0.1195	D(CRR(-1))	-0.131786	-0.570209	0.5770
D(CRR(-2))	-0.139573	-0.857239	0.4048	D(CRR(-2))	-0.120606	-0.559104	0.5843
D(CRR(-3))	-0.232074	-1.399766	0.1819	D(CRR(-3))	-0.102199	-0.497719	0.6259
D(MPR(-1))	-0.120323	-0.527543	0.6055	D(MPR(-1))	-0.207444	-0.746374	0.4670
D(MPR(-2))	-0.141386	-0.606141	0.5535	D(MPR(-2))	-0.440358	-1.547074	0.1427
D(MPR(-3))	-0.278622	-1.566981	0.1380	D(MPR(-3))	-0.154043	-0.666676	0.5151
D(TBR(-1))	0.092123	0.811187	0.4299	D(TBR(-1))	0.088748	0.679550	0.5071
D(TBR(-2))	-0.077051	-0.738237	0.4718	D(TBR(-2))	0.006783	0.050879	0.9601
D(TBR(-3))	-0.120492	-1.144914	0.2702	D(TBR(-3))	-0.021368	-0.157643	0.8768
ECM(-1)	0.104990	0.598548	0.5584	ECM(-1)	0.039505	0.183399	0.8569
R2	0.551519			R2	0.360138		
Adj R2	0.162836			Adj R2	0.194409		
F-Stat	3.418942			F-Stat	3.649427		
F-prob	0.046133			F-prob	0.049772		
DW	1.967650			DW	2.124435		

Source: Extract from E-view 9.0

The corresponding sign of Error Correction Term (ECT) is not negative but not significant. This means that there is a long run causality running from independent variables to the dependent variable. The negative sign of (ECT) indicates a move back towards equilibrium following a shock to the system in the previous year. The R² from the models proved that the independent variables can explain 55.1 and 36 percent changes on the dependent variables. The models are statistically significant from the value of f-statistics and probability. However, the ECM coefficient indicates that the models can adjust at the speed of 10 and 3 percent annually. The coefficient of the variables defines the effect of the independent variables on the dependent variables at various lags.

Table 5: Granger Causality Test

Null Hypothesis	Obs	F-Statistic	Prob.	Null Hypothesis	Obs	F-Statistic	Prob.
Central Bank Rate and Credit To Private Sector				Central Bank Rate and Credit core To Private Sector			
CRR does not Granger Cause CPS	32	1.27536	0.2969	CRR does not Granger Cause CCPS	32	0.10170	0.9037
CPS does not Granger Cause CRR	32	10.1208	0.0006	CCPS does not Granger Cause CRR	32	4.65175	0.0192
MPR does not Granger Cause CPS	32	1.32199	0.2833	MPR does not Granger Cause CCPS	32	2.91552	0.0714
CPS does not Granger Cause MPR		1.05067	0.3636	CCPS does not Granger Cause MPR	32	1.54189	0.2322
TBR does not Granger Cause CPS	32	2.54881	0.0968	TBR does not Granger Cause CCPS	32	2.08368	0.1440
CPS does not Granger Cause TBR		3.22693	0.0554	CCPS does not Granger Cause TBR	32	0.32995	0.7218

Source: Extract from E-view 9.0 (2020)

Pair wise causality tests were run on the models with an optimal lag of 2. The result is presented in table 5 above. The researcher’s interest here is to establish the direction of causality between the dependent variables and the independent variables from 1985-2018. In the models there is unidirectional causality from credit to private sector to cash reserve ratio and unidirectional causality from credit to core private sector to cash reserve ratio.

Table 6: Short Term Regression Results

Central Bank Policy and Credit To SMEs Sector				
Variable	Coefficient	t-test	Prob.	
TBR	0.578250	1.752140	0.0903	
MPR	0.344092	0.819884	0.4190	
CRR	-0.220736	-1.003312	0.3240	
C	-5.817074	-1.091774	0.2839	
R ²	0.185083			
Adj R2	0.100781			
F-Stat	2.195477			
F-Prob	0.109942			
DW	0.772916			

Source: Extract from E-view 9.0

The statistical inference for the short run estimated results are found to be valid since the residuals are stationary in level as shown in table below. This concludes that the variables are co-integrated or there is a long run relationship between the variables. The results of the short-run estimation are presented in table above along with the corresponding diagnostic tests in tables below. To find out how well the model fits a set of observations, the R² indicates that 18.5 percent variation in commercial bank funding to small and medium scale enterprises sector is explained within the model. Nonetheless, the R² cannot determine whether the coefficient estimates and predictions are biased, hence further assessment of the residuals are necessary. From the results it could be deduced that treasury bill rate and monetary policy rate have positive effect on credit to small and medium scale enterprises sector while cash reserve ratio have negative effect on credit to small and medium scale enterprises sector.

Table 7: Unit Root Test

Central Bank Rate and Credit To SMEs Sector				
Variable	ADF	5%	Prob.	
SMEs	-5.921945	-2.976263	0.0000	
TBR	5.025161	-2.954021	0.0000	
MPR	-6.804960	-2.963972	0.0000	
CRR	-5.634717	-2.986225	0.0001	

Source: Extract from E-view 9.0

The time series properties of the variables used in the analysis was investigated using Augmented Dickey-Fuller test. The test was run with specification of trend and intercept in the model. The ADF statistics for the test are presented in the table 7 above. It can be seen

from the table above that the unit root test results, using the ADF unit root test suggest that all series are stationary at order I (1) because they become stationary after being differenced once. Therefore, the Engle and Granger (1987) can be employed.

Table 8: Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.* *
Central Bank Policy Rate and Credit To SMEs Sector				
None *	0.609753	28.22930	27.58434	0.0413
At most 1 *	0.267506	9.339022	21.13162	0.8042
At most 2	0.177710	5.869862	14.26460	0.6300
most 3	0.000693	0.020802	3.841466	0.8852

Source: Extract from E-view 9.0

From table 8 the results of the Johansen co-integration test show that we adopt the null hypotheses of no co-integrating equation at the 5% level of significance. This implies that, there is no linear combination of the variables that are stationary in the long run and also confirms the existence of a long-run relationship between monetary policy variables and credit to small and medium scale enterprises sector in Nigeria.

Table 9: Error Correction Model

Central Bank Policy Rate and Credit To SMEs Sector				
Variable	Coefficient	t-test	Prob.	
C	0.955617	0.815154	0.4286	
D(SMES(-1))	0.107549	0.451151	0.6588	
D(SMES(-2))	0.366290	1.194414	0.2522	
D(SMES(-3))	0.103667	0.300344	0.7683	
D(TBR(-1))	-0.840321	-2.207282	0.0445	
D(TBR(-2))	-0.659684	-1.278718	0.2218	
D(TBR(-3))	0.097865	0.263941	0.7957	
D(MPR(-1))	1.030062	1.881087	0.0809	
D(MPR(-2))	0.437927	0.556001	0.5870	
D(MPR(-3))	0.467051	0.909671	0.3784	
D(CRR(-1))	0.137085	0.292865	0.7739	
D(CRR(-2))	-0.047874	-0.110820	0.9133	
D(CRR(-3))	-0.846506	-1.521354	0.1504	
ECM(-1)	-0.396637	-1.808193	0.0921	
R ²	0.598598			
Adj R ²	0.225867			
F-Stat	1.605981			
F-prob	0.195135			
DW	1.743702			

Source: Extract from E-view 9.0

The corresponding sign of Error Correction Term (ECT) is negative but not significant. This means that there is a long run causality running from independent variables to the dependent variable. The negative sign of (ECT) indicates a move back towards equilibrium following a shock to the system in the previous year. The R² from the model proved that the variables can explain 59.8 percent changes on the dependent variable. The models are statistically not significant from the value of f-statistics and probability. However, the ECM coefficient indicates that the model can adjust at the speed of 39.6 percent annually. The coefficient of the variables defines the effect of the independent variables on the dependent variable at various lags.

Table 10: Granger Causality Test Central Bank Policy Rate and Credit to SMEs Sector

Null Hypothesis	Obs	F-Statistic	Prob.
TBR does not Granger Cause SMES	32	0.94675	0.4015
SMES does not Granger Cause TBR	32	8.10697	0.0019
MPR does not Granger Cause SMES	32	3.31851	0.0527
SMES does not Granger Cause MPR		0.18085	0.8356
CRR does not Granger Cause SMES	32	0.44903	0.6433
SMES does not Granger Cause CRR	32	0.30174	0.7422

Source: Extract from E-view 9.0

Pair wise causality tests were run on the model with an optimal lag of 2. The result is presented in table 10 above. The researcher’s interest here is to establish the direction of causality between the dependent variables and the independent variables from 1985-2018. In the model, there is uni-directional causality from banks’ lending to Small and medium scale enterprises sector and treasury bill rate.

Discussion of Findings

Model one examined the relationship between central bank policy rates and credit to private sector in Nigeria. From the estimated regression model from result of the vector error correction model in table 1 the relationship between central bank policy rates and credit to private sector is high and significant. This is because of an R² of 0.551519 meaning that the model explains approximately 55 percent of the total variations in the credit to private sector, the error correction model shows a positive value of 0.104990 which is appropriate and is significant. This means that 10.4 percent of the deviation from long run equilibrium relationship in the credit to private sector is corrected every year since credit to private sector is estimated annually. Some of the values of the coefficient of independent variables, that is central bank policy rates are positive and also proved negative at various lags. The findings of this study is supported by Keynesian liquidity preference theory as it could be used to determines the interest rate by the demand for and supply of money which is a stock theory. It emphasizes that the rate of interest is purely a monetary phenomenon. It further validates loanable funds theory which is a flow theory that determines the interest rate by the demand for and supply of loanable funds. The positive findings of the study confirm the findings of Zuzana, Riikka and Laurent (2015) who found no evidence of the bank lending channel through the use of reserve requirements. The author noted that changes in reserve requirements influence loan growth of banks. Findings from Adeniyi et al. (2018) also confirm that structural changes in monetary policy system exerted positive impact on loans and advances and that the MPR

is a significant variable which causes loans and advances of deposit money banks in Nigeria. Ogolo and Tamunotonye (2018) finds positive relationship between interest rate and monetary policy rate with commercial banks' lending to the agricultural sector but opine that treasury bill rate, broad money supply and bank liquidity ratio have negative effect on the dependent variable. The findings of João, Barroso and Gonzalez (2017) that the easing impacted the lending channel on average two times more than the tightening. Foreign and small banks mitigate these effects and banks are prone to lend less to riskier firms. The findings of Mohammed (2014) that there was co-integration between re-positioning of commercial banks and capacities of SMEs to deliver services and also a significant dispersion resulting from lending conditions and macroeconomic variables and the findings of Ovat (2016) that exchange rate and lending rate are statistically significant to SMEs credit. Model two examined the relationship between central bank rates and Credit to core private sector in Nigeria. The estimated regression model from result of the vector error correction result in table 4 the relationship between money central bank policy and credit to core private sector is moderate and significant. This is because of an R^2 of 0.360138 meaning that the model explains approximately 36 percent of the total variations in the credit to core private sector. The error correction model shows a positive value of 0.039505 which is appropriate and is significant. This means that 3.9 percent of the deviation from long run equilibrium relationship in the credit to core private sector is corrected every year since credit to core private sector is estimated annually. Some of the values of the coefficient of independent variables, that is central bank rates are positive and also proved negative at various lags.

The findings of this study is supported by Keynesian liquidity preference theory as it could be used to determines the interest rate by the demand for and supply of money which is a stock theory. It emphasizes that the rate of interest is purely a monetary phenomenon. It further validates loanable funds theory which is a flow theory that determines the interest rate by the demand for and supply of loanable funds. The positive findings of the study confirm the findings of Zuzana, Riikka and Laurent (2015) who found no evidence of the bank lending channel through the use of reserve requirements. The author noted that changes in reserve requirements influence loan growth of banks. Findings from Adeniyi et al. (2018) also confirm that structural changes in monetary policy system exerted positive impact on loans and advances and that the MPR is a significant variable which causes loans and advances of deposit money banks in Nigeria. Ogolo and Tamunotonye (2018) finds positive relationship between interest rate and monetary policy rate with commercial banks' lending to the agricultural sector but opine that treasury bill rate, broad money supply and bank liquidity ratio have negative effect on the dependent variable. The findings of João, Barroso and Gonzalez (2017) that the easing impacted the lending channel on average two times more than the tightening. Foreign and small banks mitigate these effects and banks are prone to lend less to riskier firms. The findings of Mohammed (2014) that there was co-integration between re-positioning of commercial banks and capacities of SMEs to deliver services and also a significant dispersion resulting from lending conditions and macroeconomic variables and the findings of Ovat (2016) that exchange rate and lending rate are statistically significant to SMEs credit. Model three was formulated to examine the relationship between central bank policy rates and credit to small and medium scale enterprises sector in Nigeria. The estimated regression model from the result of the vector error correction result in table 9, the relationship between central bank rates and credit to small and medium scale enterprises sector is significant. This is because of an R^2 of 0.598598 meaning that the model explains approximately 59 percent of the total variations in the credit to small and medium scale enterprises sector. It is also evidence that the error correction model shows a negative value of -0.396637 which is appropriate and is significant. This means that 39 percent of the

deviation from long run equilibrium relationship in the credit to small and medium scale enterprises sector is corrected every year since credit to small and medium scale enterprises sector is estimated annually. Some of the values of the coefficient of independent variables, that is central bank rates are positive and also proved negative at various lags. The negative effect of findings of the study confirm the findings of Nto et al. (2012) that policies on interest rate and liquidity ratio were negatively and positively significant to SMEs. The negative findings also confirm the study of Abdullahi (2014) that credit to core private sector has a negative relationship with monetary policy rate and stress that increase in monetary policy rate also do not increase the ability of banks to lend to the private sector of the Nigerian economy. Amidu and Wolfe (2017) that Ghanaian banks' lending behavior are affected significantly by the country's economy also support and change the money supply and that the central bank prime rate and inflation rate negatively affect bank lending. Gambacorta and Iannotti (2015) that the speed of adjustment of bank interest rate to monetary policy changes increased significantly after the introduction of the 1993 Banking Law. Kashyap and Stein (2015) that when policy is tightened, both total loans and business loans at small banks falls, while loans at large banks are unaffected. Findings from Adeniyi et al. (2018) also confirm that structural changes in monetary policy system exerted positive impact on loans and advances and that the MPR is a significant variable which causes loans and advances of deposit money banks in Nigeria. Ogolo and Tamunotonye (2018) finds positive relationship between interest rate and monetary policy rate with commercial banks' lending to the agricultural sector but opine that treasury bill rate, exchange rate, broad money supply and liquidity ratio have negative effect on the dependent variable.

Conclusion

In model one, the empirical findings proved that the $F^*_{cal} = 3.418942 > F^*_{tab} = 2.24$ at 5% $n=31$ is statistically significant which is supported with a probability value of $0.046133 < 0.05$ at 5% is significant, we therefore reject the null hypothesis, that is $\beta_1-\beta_3$ (central bank policy rates) is statistically significant with credit to private sector in Nigeria. Therefore, we conclude that there is significant relationship between central bank policy and credit to private sector in Nigeria. It was proved in model two that, the $F^*_{cal} = 3.649427 > F^*_{tab} = 2.24$ at 5% $n=31$ is statistically significant which is supported with a probability value of $0.049772 < 0.05$ at 5% is significant, we therefore reject the null hypothesis, that is $\beta_1-\beta_3$ (central bank policy) is statistically significant with credit to core private sector in Nigeria. Therefore, we conclude that there is significant relationship between central bank policy and credit to core private sector in Nigeria. The study found in model three that, the $F^*_{cal} = 1.605981 < F^*_{tab} = 2.24$ at 5% $n=31$ is statistically not significant which is supported with a probability value of $0.195135 > 0.05$ at 5% is not significant, we therefore reject the alternate hypothesis, that is $\beta_1-\beta_3$ (central bank policy) is statistically not significant with credit to small and medium scale enterprises sector in Nigeria. Therefore, we conclude that there is no significant relationship between central bank policy and credit to small and medium scale enterprises sector in Nigeria.

Recommendations

1. The study recommends the need for monetary authorities to stabilize Central bank policy rates. This will affect the availability of financial intermediary credit as central bank adjusts the level of money supply. An increase in money supply (exogenous supply by central bank) puts downward pressure on market interest rates thereby making additional funds available for investments at lower terms. This will further cause demand for investments to increase and subsequently, output will expand.
2. The study recommends that deposit money banks should reduce deposit money bank rates. This is because changes in interest rates and bank credits may lead to changes in the real sector through investment and influence of aggregates demand.

References

- Adelegan, A.E. (2018). Private domestic investment, Domestic Credit to the private sector and economic performance: Nigeria in perspective. *IOSR Journal of Economics and Finance (IOSR-JEF)*. 9 (3), 22-31.
- Adeniyi1, A.M., Adeyemi, A.K, Salawudeen O.S. and Fagbemi, T.O. (2018). Monetary Policy and Bank Credit in Nigeria: A Toda-Yamamoto Approach. *ACTA UNIVERSITATIS DANUBIUS*. Vol 14, 5, 718.
- Adefeso, H. A. & Mobolaji, H. I., (2010). The fiscal-monetary policy and economic growth in Nigeria: Further empirical evidence. *Pakistan Journal of Social Sciences*, 7(2), 137– 142.
- Adofu, I., Abula, M. & Audu, S. I. (2010). An assessment of the effects of interest rate deregulation in enhancing agricultural productivity in Nigeria. *Current Research Journal of Economic Theory* 2(2), 82-86. Retrieved from <http://maxwellsci.com/print/crjet/v2-82-86.pdf>.
- Afonso, A, and Aubyn, M. (1997). Is There Credit Rationing in Portuguese Banking? *Department of Economics, Working Paper No 6 (97)*.
- Akani, H. W., (2017). Effects of Monetary Policy Transmission Mechanism on Capital Market Fundamentals in Nigeria: 1981 – 2015 (Unpublished PhD Thesis), Nnamdi Azikiwe University, Awka, Nigeria.
- Alper, D., Anbar, A. (2011) “Bank Specific and Macroeconomic Determinants of Commercial Bank Profitability: Empirical Evidence from Turkey” *Business and Economic Research Journal* Volume 2. Number 2.2011 pp.139-152 ISSN: 1309-2448 Retrieved from <http://ssrn.com/abstract=1831345>.
- Alper K. (2012). An empirical study on liquidity and bank lending. *Central Bank of the Republic of Turkey Merkez Bank Working Paper No. 12/04*.

- Amassoma, J.D., Nwosa, P.I. and Ofere, A.F. (2011). The nexus of interest rate, deregulation lending rate and agricultural productivity in Nigeria. *Current Research Journal of Economic Theory*,3, (2):53-60.
- Amidu, M. & Wolfe S. (2008). The Impact of Monetary Policy on Banks Credit in Ghana,IAABD Proceeding Trace 1.
- Anigbogu, T. U., Okoli, I. M. & Nwakoby, N. P. (2015). Financial intermediation and small and medium enterprises performance in Nigeria (An aggregated analysis: 1980-2013). *European Scientific Journal*, 11(28), 257-272.
- Arora, R.U. (2014). Access to finance: An Empirical Analysis. *European Journal of Development Research*, 26 (5), 798-814.
- Ayub, G. & Seyed, A.M. (2016). The relationship between monetary policy and bank lending behavior and the influence of bank specific features on this relationship in the banks listed on the Tehran Stock Exchange. *International Journal of Advanced Biotechnology and Research (IJBR)*, 7(2).115-125.
- Baltensperger, E. & Devinney, T. (1985). Credit rationing theory: A survey and synthesis. *Zeitschrift für die gesamte Staatswissenschaft*, 14(1), 475–502.
- Bester, H., (1984). "Screening versus Rationing in Credit Markets with Imperfect Information," *Discussion Paper* No. 136.
- Bester, H. (1985). Screening vs. rationing in credit markets with imperfect information. *The American Economic Review*, 75 (4), 850-855.
- Central Bank of Nigeria (2016). Monetary Policy at a Glance. Monetary Policy Department Series. Accessed at <https://www.cbn.gov.ng/Out/2017/CCD/MONETARY%20POLICY%20AT%20A%20GLANCE.pdf>.
- Charles, W. C. Joseph, R., M. and David C. W. (2011). Did Doubling Reserve Requirements Cause the Recession of 1937-1938? *A Microeconomic Approach: Working Paper*.
- Coast, warren w. L. (1980). The use of reserve requirement in developing countries. Money and monetary policy in less developed countries: a survey of issues and evidence.
- Courage, O.E. & Leonard, N.A, (201. Impact of commercial banks' credit to the real sector on economic growth in Nigeria, *Oradea Journal of Business and Economics*, University of Oradea, Faculty of Economics, vol. 4(1), pages 38-46, March.

Cressy, R. (1996). Funding gaps: A symposium. *The Economic Journal*, 112 (477) F1-F16.

Cressy, R. (2006). Why do Most Firms Die Young? *Small Business Economics*, 26(2), pp. 103-116.

D'POLA, K. U. and TOUK, M.C. (2016). The Effect of Commercial Bank credit on the output of small and medium enterprises in Cameroon: Empirical evidence from 1980-2014. *Maghreb Review of Economic Management*. Vol 03 - N° 02.

Echekoba, F.N. & Ubesie M.C. (2018) Assessment of Financial Deepening on the Growth of Nigerian Economy: 1990-2016. *International Journal of Academic Management Science Research (IJAMSR)*. Vol. 2 Issue 11, Pages: 70-82.

Enyioko N. (2012) Impact of Interest Rate Policy and Performance of Deposit Money Banks in Nigerian. *Global Journal of Management and Business Research* Volume 12 Issue 21 Online ISSN: 2249-4588 & Print ISSN: 0975-5853.

Gambacorta, L., (2005). Inside the bank lending channel. *European Economic Review* 49(7): 1737–1759.

Gujarati, D. N. (2004). *Basic econometrics (4th Ed.)* McGraw-Hill, New York.

Jegede, C.A. (2014). Impacts of monetary policy on the commercial banks 'lending in Nigeria. *Review of Public Administration and Management*, 3(5), pp. 134 – 146.

Jhingan, M. L (1992). *Macroeconomic theory*. 10th Edition, Vrinda Publications Ltd, New Delhi

João B. R., Barroso, R. B., Gonzalez, B. F. Nazar V. D. (2017). Credit Supply Responses to Reserve Requirement: loan-level evidence from macroprudential policy. *Banco Central do Brasil. Working Paper Series 467*.

Johansen, S. (1988); "Statistical Analysis of Cointegration Vectors". *Journal of Economics Dynamic and Control*, 12, 231 – 254.

John, N. N. U. and Onwubiko, N. D. (2013). Challenges of bank credit among small and medium enterprises in Nigeria. *Journal of Economics and Sustainable Development*, 4(6), 84-90

Karimo, T.M. and Ogbonna, O.L (2017). Financial Deepening and Economic Growth Nexus in Nigeria: Supply-Leading or Demand-Following? *Economies. MPDI Articles*.

Kashyap, A. K. & Stein, J. C. (2015). The impact of monetary policy on bank balance sheets, *Carnegie-Rochester conference Series*, 42, 151-195.

- Keeton, W. (1979). *Equilibrium credit rationing*. New York: Garland Press.
- Matthews, K., & Thompson, J. (2014). *The economics of banking*, Wiley: Chichester, (3rd Edition).
- Mitku, M. Y. (2018). Lending and cash required reserve: Empirical evidence from Ethiopian commercial bank. *European Scientific Journal*.14, (13), 179-189.
- Mohammed, O. (2014). Re-positioning commercial banks to enhance the productive capacities of Small and Medium – Scale Enterprises (SMEs) for economic growth of developing nations: A focus on Nigeria. *International Journal of Public Administration and Management Research*, 2(2): 193-198
- Nasko, A. M. (2016). Impact of Monetary Policy on the Economy of Nigeria. *Pyrex Journal of Business and Finance Management Research* Vol 2. Pp.163-179.
- Nto, P. O., Mbanasor, J. A., & Osuala, A. E. (2012). Influence of monetary policy variables on loan supply to small and medium scale enterprises in Nigeria. *International Journal of Economics and Finance*, 4(7), 157-164.
- Nwosu, F. O., (2010). The agricultural credit guarantee scheme: its role, problems and prospects in Nigeria’s quest for agricultural development. *Researchers*, 2 (2); 120-135.
- Ogolo & Tamunotonye M. (2018). Monetary Policy and Commercial Bank Lending to the Real Sector in Nigeria: A Time Series Study. *American Finance & Banking Review*; Vol. 2, No. 1; 2018.
- Okoye V. and Eze, O. R. (2013) 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.
- Olorunmade, G., Samuel, O.J., and Adewole, J. A. (2019) Determinant of Private Sector Credit and Its Implication on Economic Growth in Nigeria: 2000-2017. *American Economic and Social Review*. Vol. 5 No 1.
- Olukayode, R., & Somoye, C. (2018). The impact of finance on entrepreneurship growth in Nigeria: *International Journal of Small and Medium Enterprises*, 1(2); 117-227.
- Ovat, O. O. (2016). Commercial banks’ credit and the growth of small and medium scale enterprises: The Nigerian experience. *Journal of Economics and Finance*, 7(6), 23-30
- Rufino, G. C. (2008). The Steady State Relationship and the Spread between Treasury Bills and Commercial Lending Rates. *DLSU-AKI Working Paper Series 2008-2*.

Saunders, S. (2010). *Financial Markets and Institutions: An introduction to the risk management approach*. McGraw Hill Pub.

Sesay, B., and Abdulai, B.S. (2017). Monetary policy effects on private sector investment: Evidence from Sierra Leone. *International Journal of Economics and Financial Issues*, 7(1), 476-488.

Somoye, R. O. C., Ilo, B.M., 2009. The impact of macroeconomic instability on the banking sector lending behavior in Nigeria. *Journal of Money, Investment and Banking* 7, 88-100.

Stiglitz, J. E., & Weiss, A. (1981). Credit rationing in markets with imperfection. *American Economic Review*, 71, (3), 16-36.

Stiglitz, J., and Weiss, A. (1984). Credit rationing and collateral in corporate finance. *Cambridge: Cambridge University Press*.

Stiglitz, J., & Weiss, W. (2001). Credit rationing in markets with imperfect information. *American Economic Review*, LXXI, 393-410.

Terrier, G., Valdes R., Tovar C., Chanlau J., Fernandez-Valdovinos C., Garcia-Escribano M., Medeiros C., Tang M., Vera Martin M., Walker C. (2011), Policy Instruments to Lean Against the Wind in Latin America, IMF Working Paper WP/11/159.

Ubesie1, C.M., Echekoba, F.N., Chris-Ejiogu, U.G. and Ananwude, A.C. (2019). Sectoral Allocation of Deposit Money Banks' Credit and the Growth of Nigerian Real Economy: A Disaggregated Analysis (2008Q1 – 2017Q4). *Journal of Economics, Management and Trade* 22(1): 1-22, 2019.

Udeh, S.N. (2015). Impact of monetary policy instruments on profitability of commercial banks in Nigeria: Zenith bank experience. *Research Journal of Finance and Accounting*, 6(10), pp. 190-206.

William, O., Zehou, S. and Hazimi, B.H., (2019). Determinants of domestic credit to the private sector in Ghana: Application of Vector Auto Regressive Method. *Advances in Social Science, Education and Humanities Research*, volume 309.

Zuzana, F., Riikka, N. and Laurent, W. (2015). Reserve Requirements and the Bank Lending Channel in China (September 21, 2015). *BOFIT Discussion Paper No. 26/2015*. Available at SSRN: <https://ssrn.com/abstract=2668105>.