# CREDIT CRUNCH, BANK LENDING AND MONETARY POLICY IN NIGERIA

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**Abstract**

Monetary policy remains the key to every nation's development and the financial system of an economy is made of institutional arrangements designed to transform savings into investments. Due to this purpose, this study examined the impact of credit crunch, bank lending on monetary policy in Nigeria from 1981 to 2020 using ARDL co-integration approach. The regression estimates showed the existence of a long-run relationship between credit crunch, bank lending and monetary policy in Nigeria. Also, the ARDL regression estimate results pointed that credit crunch has a positive and significant impact on monetary policy while loan to deposit ratio, bank lending and GDP growth rate exerted negative and significant relationship on monetary policy. Other variables like inflation rate and money supply growth rate indicated a negative and insignificant impact on monetary policy. Based on the findings of the study, we conclude that credit crunch positively impact the Nigerian economy both in the short run and long run within the study period through sound bank lending processes, thus concluding that credit crunch is a key determinant of monetary policy in Nigeria. Consequently, the study recommends that credit crunch as a result of lending rate in most of our financial institutions should be moderated accordingly so as to reflect, respond rapidly to local economic conditions, also monetary authorities should modified most of its tools and incorporate some of the macro prudential variables in its dealings with the aim of suppressing the adverse effect of inflationary pressure in the economy.

**Keywords:** Credit crunch, Monetary policy, Bank lending, Mechanism, Expansionary

## Introduction

From the global perspective, the nature of banking activities and banks' position as intermediary makes the institutions relevant for the transmission of monetary policy, (Luis and Rodrigo 2004). The channels of monetary policy transmission depend on the functioning of the banking sector. Over two decades, the exert actions of transmission

of monetary policy on credit crunch and credit facilities have been a controversial discourse among scholars.

Bernanke & Gertler (1995) believe that lending rate channel for monetary policy transmission is becoming less significant due to changes in bank regulations. This was supported by Bernanke, Gertler, and Gilchrist (1999) and Crawford, Pavanini and Schivardi (2015) with a view that asymmetric information in financial market plays an important role. Studies have ascertained that asymmetric information can generate market failures such as credit rationing, inefficient provision, mispricing of risk and in the limit market breakdown. On a contrary opinion, Alfaro, Franken, Garcia and Jara (2004) believe in the monetary policy transmission mechanism through bank lending. The authors find that monetary policy tightening is consistent with a reduction in the growth of total loans, for instance in the case of consumer loans, capitalization and liquidity tend to reduce the effect of monetary policy on the supply of loans i.e. a negative monetary policy shock immediately reduce the low/high quality ratio. Muric (2010) further argued that banks and other financial institutions react to any official change rate by changing their own savings and loans rates while the changes in markets will affect the spending patterns of consumers and firm by cutting back spending but at the aggregate demand and supply level, if the economy is already at a bloated point like Nigeria, further aggregate demand increases inflation in an economy. While on a mixed opinion, Gertler & Gilchrist, (1994) argued that a monetary policy tightening causes sale, inventories and short term debt to decline for small firms but they remain unchanged for large firms. The authors further stressed that financial factors propagate the effect of a monetary shock which makes external finance more expensive relative to fund raised internally, the shrink in the net worth will reduce the borrower's spending and production which are behind the differences discovered between large and small firm behaviour. But Omankhanlen, Okorie and Taiwo (2015); Lucky and Etale (2016) negate the above opinion from Nigeria perspective.

In the context of developing economics like Africa, the efforts of monetary policy to influence credit facilities and bank lending is of central concern to policy maker where the channels of monetary policy are impeded by financial underdevelopment and weak institution, (Beck et al 2009). In the same vein, in spite of the effort made by central bank of Nigeria with respect to policy rate in interbank markets, unfortunately these changes have exerted limited impact on other rates which in turn has showcased a ripple effect on the economy of the developing countries as put by (Fischer, 2015). Despite the claim above, Blanchard (2014) stressed that the macroeconomics of low income and of advanced economies are incredibly different. The role of banking seems so essential to understanding how monetary policy is transmitted to the financial institution in the area of credit availability and bank lending in an economy. However, there is far less agreement about exactly how monetary policy exerts its influence on credit crunch and bank lending due to the available shortcomings. This considerable

controversy about the mechanism which causes monetary policy to affect nominal national income has given rise to suggestions about varied and empirically testable channels of monetary transmissions. Although there is an affirmative proof that banks do play a key part in the transmission of monetary policy actions to the economy through the provision of liquidity services, maturity transformation and the pooling of risks but there is a level of reservations over the precise role that banks play, (Freixas and Rochet, 1997).

In Nigeria context, it is a vested action of the monetary authorities to influence the flow of money and credit in an economy in order to achieve desired macroeconomic objectives of stability and growth. This is a precise step taken by the Central Bank of Nigeria to control the value, supply and cost of money in the economy with a view to achieving targeted macroeconomic objectives (CBN, 2011; 2013). This action is implemented by tightening liquidity condition in the banking system or varying money supply and interest rates with the aim of regulating as well as controlling the quantity of money in the economy, (Petersson 2001).

Monetary policy play an important role in any economy and this has made policy maker and other relevant stakeholders to accord special attention to the conduct of monetary policy on credit facilities and in order vast the issue of credit crunch. Part of the main objectives of monetary policy to the banking sector is to ensure price and monetary stability while ensuring sustainable investment and growth in the economy. This is achievable by causing savers to avail investors of surplus funds for investment through appropriate interest rate structures, applying deliberate policies to expand the scope of financial system and steaming the oscillation in exchange rate of the naira and credit rationing or scarcity (Emefiele, 2019; Bernanke and Gertler, 1995). For instance, the current downward review adjustment of monetary policy rate is a means to meeting the yearnings of the investors in the manufacturing sector of the economy and to improve the well-being of the citizen. It is thus a discretionary control of money supply by the monetary authorities in order to achieve economy stability.

Before the Structural Adjustment Program of 1986, specific credit controls were utilized to direct the financial framework. The fixing of generally low financing costs was done deliberately to improve venture and development. Once in a while, extraordinary stocks were forced on banks to decrease the measure of abundance holds and their credit making limit (Jegede, 2014). In 1990s, the significance of credit crunches as pertained to bank capital crunches was questionable but widely determined during the 2008 monetary disaster that credit availability was clearly a difficulty (Berger and Udell 1994 and Oliner and Rudebush 1996). Likewise, different macro-prudential tools have been introduced to dampen business cycles volatility and ameliorate monetary policy operations as well as potentially enhance welfare. According to Lim *et al* (2011) factors such as the level of economic and financial sophistication, exchange rate regime and

the economy´s exposure or vulnerability to certain shocks are significant determinants of the choice of instruments. For instance, Nigeria has suffered from spates of banking failures, volatility in financial markets, currency misalignment and macroeconomic instability. In view of mitigating the above problems, several reform policies have been introduced with less understanding of the channels of transmission mechanism.

various empirical investigations had been carried out to ascertain factors responsible for financial crisis such as: mark -to- market accounting, securitization of loans, systemic failures, regulatory absence or failures, stock market bubbles, liberal lending practice, broken international monetary system, monetary policy among others while a wide range of regulations and market managing tools through monetary policy were re-strengthen to curtail the crisis but all to no avail because the mechanisms driving the contraction of credit experienced during the crisis have received less significant (Ozili, 2019 & Maxfield, 2015). Despite the right attention given to monetary policy adjustment among the developing countries over the years including the current monetary policy rate downward review with the aim of boasting credit facilities and bank lending in Nigeria, it effect has not reflected significantly on credit availability and bank lending as expected based on the available fact compare to the advanced economy. More so, Nigeria economy has been categorized as the biggest economy in Africa, yet our GDP growth rate has been solely unstable till the time of contraction in 2015 and the level at which the economy growth is dwindling despite this effort is far from the direction compare with other developing nations of the world and their growth rates such as Ethiopian 8.5%, South Africa 6.5%, India 6.8%, Pakistan 5.4%, Turkey 4% respectively while much of them aided credit facilities for their manufacturing sector. Furthermore, the double digits of monetary policy rate in Nigeria hinders the ease of credit availability and bank loans which is far beyond government desire for a single rate regime for loans and advances when compare to other countries which operates single digit rates, (Udeh, 2015). Likewise, some studies identified the causes and effect of financial crisis both from developed and developing economies but the mechanism behind the contraction of credit experienced during the crisis have not been attended to in Nigeria (Fidrmuc & Hainz, 2013; Obodoekwe & Chukwubuzo, 2014; Ngwube & Ogbuagu, 2014; Pigini *et al*, 2016; Presbitero *et al*, 2016 among others). For instance, Obodoekwe & Chukwubuzo (2014) identified loss of confidence by investors on capital provider, bankruptcy, inadequate information, inappropriate lending rates, reduction in market prices and others as the causes of financial crisis while Ngwube & Ogbuagu (2014) highlighted inefficient bank regulation and regulatory framework, lack of inter-bank lending within the sector, sudden unrest in banking sector and reduction or outright cancellation off-shore credit line as the adverse effect of financial crisis melted on Nigeria economy.

Also, various empirical investigations had been conducted on this concept from different perspective. For instance, the nexus between monetary policy and bank credit in

Nigeria (Afolabi et al, 2018; Uwazie & Aina, 2015; Ogolo & Tamunotonye, 2018); impact of credit crunch on monetary policy in Nigeria (Obodoekwe & Chukwubuzo 2014; Tsenkwo & Longdu'ut, 2013; Girardi et al,2018); effects of monetary policy tools on financial lending deposit in Nigeria, (Ubi, Lionel & Eyo, 2012; Ajayi & Atanda, 2012; Agbonkhese & Asekome, 2013; Udeh, 2015) and so on but studies that combined credit crunch and bank lending on monetary policy is scarce compare to other macroeconomic studies in Nigeria. To the best of our knowledge, empirical work on the relationship between credit crunches, bank lending on monetary policy exhibit a mixed feelings; hence this study is out to investigate the impact of credit crunch, bank lending on monetary policy in Nigeria. Given the problem of this study and to guide the conducts of this research, this question raised for this research is; what is the impact of credit crunch and bank lending on monetary policy in Nigeria? while the objective is to examine the impact of the credit crunch, bank lending on monetary policy in Nigeria. This study will focus on Nigeria, covering a period of 39 years from 1981 to 2020 during which the country implemented the structural adjustment programme (SAP) as part of its economic stabilization program. The choice of this period is to have updated facts on the topic understudy in Nigeria.

## 2. Literature Review

The theoretical foundation of this study provides a number of reasons for asymmetric output response to changes in monetary policy. Theoretically, the following theories were considered:

Modern Theory of Interest Rate or Hicks IS-LM Curve: Hicks IS-LM model is believed that both goods market forces and money market forces determine rate of interest and real income. It also shows the interaction of the commodity market and the money market and is known as the determinate theory of interest rate. This theory has some elements in its consideration such as savings, investment, liquidity preference and supply of money in determining rate of interest and real income in both commodity market and money market with the help of IS-LM curves. IS curve has been derived from the combination of savings and investment in commodity market while LM curve is derived from the combination of liquidity preference and supply of money. IS curve shows the interaction that brings equilibrium between interest rate and the level of income at the goods market while LM curve tells us the interest rate that equilibrate the money market at any level of income. Also, is curve proves the combination of the interest rate and the level of income that are consistent with equilibrium in the market for goods and services while lm curve shows the combinations of interest rate and the level of income that are consistent with equilibrium in the market for real money balances. Thus, is-lm curves together determine the interest rate and the national income in the short run when the price level is fixed.

The effect of change in monetary policy on the rate of interest for a given level of income shows that equilibrium interest rate is depending on the supply of real money balances. For instance, if monetary authority increases the money supply at given real money balances, then the rate of interest decreases which leads to downward shifts in LM curve and the equilibrium in the money market is achieved at low rate of interest. Also when the supply of money decreases; the rate of interest increases which leads to increase in the rate of interest that shifts the LM curve upward and the money market will achieved equilibrium at high rate of interest. Thus, the LM curve shows the positive relationship between the interest rate and the income.

Business cycle theory: under this theory, the economy is often battered by unexpected shocks. Shocks to aggregate demand are typically unanticipated changes in monetary or fiscal policy. Shocks to aggregate supply are typically changes in productivity that may result, for example, from transient changes to technology, prices of raw materials, or the organization of production. Ideally firms tends to increase, choose to produce more and pay workers more when the economy is hit by favorable shocks and less when hit by unfavorable shocks (Alan, 2010).

**Empirical Review**

Andreas (2001) investigated the reaction of bank lending to monetary policy measures in Germany. Empirical evidence from dynamic panel estimations based on a data set that comprises individual balance sheet information on all German banks reveals that an average bank reduces it lending more sharply in reaction to a restrictive monetary policy measures. This can only be reversed based on bank size volume.

In the same vein, De Young, Gron, and Winton (2005) and Kim and Sohn (2017) tow the same part by investigating on commercial banks in the US economy. The authors found a support for the loan supply motivations for the pro-cyclic nature of bank lending. During an economic expansion, demand for lending was high and business profitability was good resulting in more profitable loans in which banks lend more at lower rates as they compete for businesses while during a recession, loan supply tend to decrease more than would be implied by the reduction in bank capital alone. Contrarily, Girardi et al (2018) in his study on Italian manufacturing sectors discovered that credit crunch are less pronounced during the periods of sustained economic growth especially when fund is relatively abundant but in contrast a tight monetary policy stance the quality of banking balance sheets tend to increase the likelihood of experiencing a credit squeeze.

Furthermore, Borio and Gambacorta (2017) analyze the effectiveness of monetary policy on bank lending in a low interest rate environment, the empirical analysis proofs that reductions in short-term interest rates are less effective in stimulating bank lending growth when rates reach a very low level. Also, the study finds that profitability of banks

can be explained through the low rates in the evolution of lending in the period 2010-2014.

In developing economies, the studies of Tomak (2013), Malede (2014) and Bhattarai (2016) indicated that bank lending in Turkey, Ethiopia and Nepal depend more on bank size, investment portfolio, liquidity ratio, cash reserve requirement, inflation rate, deposit, credit risk and gross domestic product while in a recent study, Charles et al (2019) employed more evidences in his study such as Uganda's supervisory credit register, micro data on loan applications, volumes and rates etc, The result shows that a monetary contraction reduces bank credit supply through increasing loan application rejections and tightening loan volume and rates especially for banks with more leverage and sovereign debt exposure. Udell, (2009); Rottmann & Wollmershauser, (2013) and Olweny &Chiluwe (2012) confirmed and corroborated the above assertions while the findings of Ayub & Seyed (2016) have contrary opinion.

In Nigeria context, some empirical studies have investigated the nature of connection between monetary policy and bank lending; banking rates and profitability of commercial banks such as:
Ajayi and Atanda (2012) examined the effect of monetary policy instruments on bank performance in Nigeria using time series data for the period 1980 – 2008. The study concluded that monetary policy instruments are not effective stimulants for bank lending in Nigeria while Jegede (2014) and Yunusa, Williams and Adegbenle (2020) on a separate study found that there exists a long-run relationship between the variables in the model and the interest rate significantly influenced commercial bank loan and advances with a target of curbing inflation in the economy. Ogolo & magnus (2018); Afolabi et al (2018), Agbonkhese & Asekome (2013), Tsenkwo & Longdu'ut (2013) also worked on this aspect with different findings and resolutions.

Also, Matousek and Solomon (2018) in his study reveals that bank size, liquidity, and capitalization were significant determinants of loan supply during this period, but contrarily Udoh, Dauda, Ajayi and Ikpechukwu (2021) opined that monetary policy tool has no strident effect on bank lending to private sector due to some factors such as: high rates of monetary policy, exchange rate crisis, Nigeria growing debt among others.

From the reviews that are related to this study, the relationship between bank lending and monetary policy is mixed while literatures on credit crunch and monetary policy are scanty. The findings from this study will give more recent, robust and reliable information on the effects of bank lending and credit crunch on monetary policy for the period of 39 years (1981 to 2020) while most of the reviewed study does not look at the three variables together. Also, this study will concentrate more on the effects of

monetary policy tools in easing credit facilities and bank lending operations to the private sectors and it output matrix.

## 3. Methodology

The method is informed by the combination of theoretical and empirical considerations that are extracts from the available data from the period of 1981 to 2020.

**Model Specification**

The model for this study rested on Hicks and Learner modern theory of interest rate which states that savings, investment, liquidity preference and money supply determine the rate of interest in conventional market through IS-LM theory. This study modifies the determinants of the theory to observe the effect of credit crunch, bank lending on monetary policy.

Conventional model is:

Y= f(X) …………………………………… (1)

Y is monetary policy proxy with MPR

X is IS-LM determinants. The proxies are:

X1= CC

X2= BL

X3= IFR

X4= LDR

X5= MS growth rate

X6= GDP growth rate.

Hence, the model is specified as follow:

MPR= f (CC, BL, LDR, IFR, MS growth rate, GDP growth rate)………………………2

Where,

MPR = Monetary Policy Rate

MS gr = Money supply growth rate

LDR = Loan to deposit ratio

IFR= Inflation Rate

CC= Credit crunch proxy with lending rate

BL= Bank lending proxy with credit to private sector.

GDP gr= GDP growth rate

Hence, the estimating equation used in this model is:

$$MPR = \beta_0 + \beta_1 BL + \beta_2 CC + \beta_3 LDR + \beta_4 IFR + \beta_5 MSgr + \beta_6 GDPgr + \varepsilon \text{------------------} (2)$$

$\beta_0$= Constant intercept

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5 \text{ and } \beta_6$ are Coefficient of the explanatory variables

U = Stochastic variable

In this research, we wish to test the strength of each of these variables on the dependent variable. The data used in this study will be gathered from Central bank of

Nigeria Statistical Bulletin and World Bank data report respectively. The a priori determination signs in the model are: $\beta_2<0$, $\beta_3>0$, $\beta_4<0$, $\beta_5>0$, $\beta_1<0$, $\beta_6>0$

**Estimation Methods and Techniques**

In analyzing the data collected, the study made use of inferential statistics, pre-test analysis using Augmented Dickey Fuller (ADF) or Philip Perron confirmatory test to determine variables' order of integration. Thereafter, the lag length and cointegration analysis were conducted to establish if there is any equilibrium (long run) relationship between the explanatory variables and the explained variable. We adopt the Error Correction Model (ECM) to distinguish between equilibrium and dynamic adjustment to equilibrium. An inferential analysis of this type requires ARDL regression estimate.

**4. Analysis and Discussion of Result**

**Table 1: Descriptive Statistics of the Variables**

|  | MPR | CC | LDR | IFR | LNBL | MS_GROWTH_RATE | GDP_GROWTH_RATE |
|---|---|---|---|---|---|---|---|
| Mean | 13.59722 | 18.26806 | 66.17393 | 19.32119 | 6.879696 | 23.10452 | 4.688817 |
| Median | 13.50000 | 17.76781 | 66.70000 | 12.00000 | 6.917814 | 20.48086 | 4.756907 |
| Maximum | 26.00000 | 29.80000 | 96.81702 | 76.75887 | 10.27683 | 57.78157 | 14.60438 |
| Minimum | 6.000000 | 9.250000 | 37.55947 | 0.223606 | 2.570346 | -2.010000 | -1.920000 |
| Std. Dev. | 3.794393 | 4.058095 | 13.47947 | 18.43841 | 2.545090 | 15.87013 | 3.897973 |
| Skewness | 0.802708 | 0.559607 | -0.089332 | 1.762009 | -0.195155 | 0.494435 | 0.377556 |
| Kurtosis | 4.979565 | 4.337717 | 2.736591 | 5.023032 | 1.672804 | 2.351321 | 2.632288 |
| Jarque-Bera | 9.744063 | 4.563193 | 0.151957 | 24.76704 | 2.870688 | 2.097972 | 1.058110 |
| Probability | 0.007658 | 0.102121 | 0.926836 | 0.000004 | 0.238033 | 0.350293 | 0.589161 |
| Observation | 36 | 36 | 36 | 36 | 36 | 36 | 36 |

**Source: Author's computation from E-views9**

The descriptive statistics is presented in Table 1. The results of the descriptive statistics as shown in Table 1 above revealed that, the average (mean) of MPR is 13.59 with S.D of 3.794. Similarly, the mean of CC is 18.26 with S.D of 4.0580. In the same vein, the mean of LNBL is 6.87 with the S.D of 2.5450 and LDR is 66.17 with S.D of 13.4794. From the above, the value of the skewness statistics revealed that other variables with the exception of LDR and LNBL are positively skewed. In addition, the Jarque-Bera statistics exhibited that the residuals of Credit crunch (CC), LDR, LNBL, MS gr and GDP growth rate (GDP gr) respectively followed a normal distribution while other variables did not. As a follow up of the outcome of the descriptive statistics of the variables, the researchers considered it necessary to check for the time series properties of the variables used.

## Table 2: Unit Root Test

| Variables | ADF-t-stat | | | PP-t-stat | | |
|---|---|---|---|---|---|---|
| | remark | T-statistics | Prob. | remark | T-statistics | Prob. |
| $MPR_t$ | 1(0) | -3.3023 | 0.0216 | 1(0) | -3.2619 | 0.023 |
| $CC_t$ | I(1) | -5.9083 | 0.0000 | I(1) | -9.5629 | 0.0000 |
| $LNBL_t$ | I(1) | -4.9820 | 0.0010 | I(1) | -4.4069 | 0.0012 |
| $LDR_t$ | I(0) | -4.7421 | 0.0005 | I(0) | -3.0602 | 0.0381 |
| $IFR_t$ | I(0) | -3.0951 | 0.0352 | I(0) | -3.0859 | 0.0359 |
| $MSgr_t$ | I(0) | -3.5100 | 0.0136 | I(0) | -3.4743 | 0.0148 |
| $GDPgr_t$ | 1(0) | -3.0418 | 0.0407 | I(0) | -3.1416 | 0.0325 |

**Source: Author's computation from E-views9**

The result of the unit-root test indicated that the variables were of mixed level of integration. The implication is that some of the variables (credit crunch and bank lending) were not stationary at level while the others were stationary at 5% level of significance. Since there are mixtures of $I(0)$ and $I(1)$ variables; with the stationary regressor, the method of Autoregressive Distributed Lag model (ADRL) will be adopted and bound test is required to test for the presence of cointegration.

## Table 3: Lag Length Criteria

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|---|---|---|---|---|---|---|
| 0 | -752.0763 | NA | 5.82e+10 | 44.65155 | 44.96580 | 44.75872 |
| 1 | -597.5174 | 236.3843 | 1.25e+08 | 38.44220 | 40.95620* | 39.29955 |
| 2 | -526.7377 | 79.10671* | 51192217* | 37.16104* | 41.87480 | 38.76857* |

**Source: Author's computation from E-views9**

The lag length for this publication was carried out been one of the fundamental pre-requisite to conduct a cointegration test. The results of the lag order selection can be

seen in table 3. The result from the table revealed that all the five methods of selections (LR, FPE, AIC, SC, HQ) jointly identified lag 2 to be the most appropriate for ARDL estimate as indicated by the asterisk in the table above except SC that identified lag 1.

**Table 4: ARDL Co-integration Bounds test result**

| F-statistic | 4.921515 | 6 |
|---|---|---|
| Critical value bounds | | |
| Significance | I0 Bound | I1 Bound |
| 10% | 2.12 | 3.23 |
| 5% | 2.45 | 3.61 |
| 1% | 3.15 | 4.43 |

**Source: Author's computation from E-views9**

The results of the bound test in table 4 revealed that there is a long run linear relationship based on the value of the f- statistics which proofs greater than both lower and upper bound of the estimate at 1%, 5% and even 10% significant level. This indicates that there is a significant long run relationship between credit crunches, bank lending and monetary policy in Nigeria economy.

**Table 5: Results of the ARDL estimate**

| Dependent Variable: MPR | | | | |
|---|---|---|---|---|
| Selected Model: ARDL(1,1,0,1,1,0,1) | | | | |
| Co-integration form | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| D(CC) | 0.333396 | 0.160630 | 2.075549 | 0.0493 |
| D(IFR) | -0.058391 | 0.033727 | -1.731318 | 0.0968 |
| D(LDR) | -0.005969 | 0.046737 | -0.127724 | 0.8995 |
| D(LNBL) | 6.801174 | 3.561708 | 1.909526 | 0.0687 |
| D(MS_GROWTH_RATE) | -0.050493 | 0.041893 | -1.093794 | 0.2854 |
| D(GDP_GROWTH_RATE) | -0.178907 | 0.150414 | -1.189430 | 0.2464 |
| CointEq (-1) | -0.907493 | 0.172681 | -5.255329 | 0.0000 |

**Source: Author's computation from E-views9**

## Table 6: Results of the ARDL estimate

| Dependent variable: MPR | | | | |
|---|---|---|---|---|
| Method: ARDL | | | | |
| Long run coefficients | | | | |
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
| CC | 0.810376 | 0.208635 | 3.884187 | 0.007 |
| IFR | -0.064344 | 0.039415 | -1.632476 | 0.1162 |
| LDR | -0.101655 | 0.047200 | -2.153703 | 0.0420 |
| LNBL | -0.569418 | 0.254974 | -2.233240 | 0.0356 |
| MS_GROWTH_RATE | -0.050493 | 0.049508 | -1.019888 | 0.3184 |
| GDP_GROWTH_RATE | -0.411601 | 0.176706 | -2329303 | 0.0290 |
| C | 12.092676 | 5.894283 | 2.051594 | 0.0518 |

**Source: own study adopted from E-view9**

The long run estimate result is presented in the table 6. A vivid look at the result of the ARDL estimate revealed that credit crunches exerts a positive and significant relationship with monetary policy in Nigeria both in short run and long run which confirms it a key determinant of monetary policy in Nigeria. Also, a percentage increase in credit crunch yields an increase in monetary policy in Nigeria by 0.810% which supported the outcome of Ayub and seyed (2016) and contradicts those of Ndugbu and Okorie (2015) study which finds credit crunch not significant to monetary policy.

Furthermore, the estimate result revealed that bank lending exerts positive and conventional significant relationship with monetary policy in short run while negatively significant at the long run in Nigeria which denotes that a 1% surge in bank lending will lead to an increase in monetary policy at the short run and decrease in monetary policy at the long run in Nigeria which confirms it's a key determinant of monetary policy in Nigeria if channeled accordingly and if the rate is at minimum. The result above supported the outcome of Charles (2019) who observed reduction in bank credit supply due to monetary contraction power, also, the reason from the above outcome may not be different from the fact that if most of the credit available are channeled appropriately and well monitored as expected it would have yielded more economic growth in return as other nations of the world.

Also, the estimate results exhibited that there is a negative and significant connection between loan to deposit ratio and GDP growth rate on monetary policy in Nigeria. The implication of the above is that, if loan to deposit ratio and GDP growth rate increase by 1%, it will lead to a decrease in monetary policy by 0.102% and 0.412% respectively while holding other variables constant. The result of this study contradict those of the

study of Oyebowale (2020) and Alfaro, Garcia and Jara (2004) whose studies finds a positive and statistically significant relationship between loan to deposit ratio, GDP growth rate and monetary policy in Nigeria and Chile respectively while inflation rate exerts a negative and insignificant relationship with monetary policy in Nigeria. Meaning that a 1% increase in inflation rate will lead to a 6% fall in monetary policy in Nigeria which supported the outcome of Oyebowale (2020) and contradict the result of Ajayi and Atanda (2012) and Ebire and Ogunyinka (2018) which says inflation rate has a positive and insignificant relationship on monetary policy in Nigeria.

For money supply growth rate, the result shows that it is negatively insignificant both at the short run and long run levels; this supports the findings of Jegede (2014) and contradicts Ogunyomi (2011) and Oyebowale (2020) which finds a positive and significant relationship between broad money and monetary policy in Nigeria.

From the table 5 the speed of adjustment towards equilibrium is 0.907 at 1% percent level of significant. This denotes that any disequilibrum among variables in the previous year would converse in long run equilibrium at the speed of 90.7% in the current year. In addition, the R-squared result show that the independent variables jointly account for 69% variations in monetary policy, hence other possible regressors not included in the model of the study account for 31% variations in monetary policy.

**TABLE 7: Results of diagnosis test**

| Fitness test | F-statistics | Probability |
|---|---|---|
| Breusch-Godfrey (Serial Correlation LM Test) | 0.7225 | 0,4972 |
| Breusch-Pagan-Godfrey (Heteroskedasticity Test) | 0.9798 | 0.4909 |
| Jarque-Bera (normality test) | 1,2255 | 0,5419 |

To crown it up, the study further ascertained the robustness of the obtained results by conducting a diagnosis tests which include serial correlation LM test, Heteroskedasticity Test and Normality test among others to confirm if the assumption of normality is fulfilled. The outcome of the test is presented in table 7 above. Based on the test of normality result in table 7, the serial correlation and heteroskdasticity test was passed as evidence in their P values ( P value> 0.05) greater than 5% level of significance, meaning the estimated model is not suffering from the problem of heteroskdasticiy problem and the null hypothesis are both rejected at 5%. Also, the normality test confirms the variables are normally distributed.

## 5. Conclusion and Policy Implications

The study investigated the impact of credit crunch, bank lending on monetary policy in Nigeria from 1981- 2020. The ARDL regression estimate results showed that MS growth rate and IFR do not impacted monetary policy both In short run and long-run, this could be due to poor handling of some of the monetary policy tools over the years. Also, the result of the study established that bank lending has a mixed linkage to monetary policy probably owing to mishandling of the available credits or not channeled it appropriately. More so, the study found that credit crunch has a positive impact on monetary policy both in the long run- and short run and significant.

Based on the findings, the study concludes that credit crunch positively impact monetary policy both in the short run and long-run in Nigeria after proper channeling and monitoring of bank lending appropriately. Surprisingly, the results support the findings of Ayub & Seyed 2016, consequently the study recommends that credit crunch as a result of lending rate in most of our financial institution should be moderated accordingly so as to easily reflect and rapidly respond to local economic conditions. In additions, credit crunch should be used to regulate bank lending in our deposit money banks operations.

Finally, the CBN should modified most of its tools and incorporate some of the macro prudential variables in its dealings so as to have robust grips of the economy with the intention of suppressing the adverse effect of inflationary pressure in the economy.

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