An Emprirical Analysis of the Effect of Monetary Policy on Economic Growth in Nigeria

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Abstract

This study investigated the impact monetary policy and economic growth in Nigeria using quarterly time series data from 1981 to 2020. The paper used growth rate of gross domestic product (GRGDP) as the dependent variable while broad money supply (MS2), monetary policy rate (MPR), Inflation (INFL), liquidity ratio (LDQR) and exchange rate (EXCH) were the independent variables as well as proxies for monetary policy. Data were obtained from Central Bank of Nigeria's Statistical Bulletin of various years and World Bank National Account Data. The study used descriptive statistics, performed unit root test using Augmented Dickey Fuller, and used the Autoregressive Distributed Lag (ARDL) model based on the E-views 10.0 software as methods of data analysis. The empirical findings indicated that Broad Money supply has a negative but insignificant effect of economic growth, the same result was observed for Inflation and exchange rate in the long run. While an insignificant positive relationship was found to exist between Monetary Policy rate and economic growth, liquidity ratio also had a positive nexus with economic growth in the long run. Consequent upon the findings, the study recommends that Monetary Policy authorities should give Monetary Policy Rate priority attention to enable it drive economic growth, persuade lenders not to lend at extremely high interest rate, ensure good coordination with the fiscal policy authorities and strive to enhance financial inclusion.

1. Introduction

Monetary Policy has largely been used in recent times in Nigeria to achieve some macroeconomic objectives. The monetary authority has applied various Monetary Policy (MP) tools available at its disposable to achieve the desire stance. MP which is one of the main drivers of growth in some economy is normal complemented by fiscal policies. However, the rising significance of monetary policy has made its effectiveness in promoting economic growth an essential goal to most monetary authorities.

In Nigeria, the Central Bank of Nigeria (CBN) is saddled with the responsibility of using monetary policy tools, the mandate of the CBN includes to ensure monetary and price stability;issue legal tender currency in Nigeria;maintain external reserves to safeguard the international value of the legal tender currency; promote a sound financial system in Nigeria; andact as Banker and provide economic and financial advice to the Federal Government (CBN, 2007).

Thus, the CBN first object is to achieve monetary and price stability, and in order to achieve this monetary policy instruments are issued through the Monetary Policy Committee (MPC). The MPC is saddled with the responsibility of formulating monetary and credit policy

There is still the debate on what monetary policy can achieve in any economy. Despite the lack of consensus among economists on how monetary policy actually works and on the magnitude of its effect on the economy, there is a remarkable strong agreement that it has some measure of effects on the economy (Nkoro, 2005).

The ability to correctly measure and understand what monetary policy can do (as well as what it cannot do) is essential for good policy-making and for choosing among alternative macro-economic frameworks (Chuku, 2009). Relying on that argument, Altman (2003) concluded that the issuance of monetary policies by the CBN has not been effectively achieve its intended purpose. A good number of Economist or scholars have blamed domestic price fluctuation as factors that undermine the success of monetary policies (Fasanya, Onakoya, & Agboluaje 2013; Adeoye, Ojapinwa, &Odekunle, 2014) and lack of adequate investments and growth (Aliyu & Englama, 2009).

1.1 Statement of Problem

One of the challenges that is facing any modern economy is the achievement and sustenance of economic growth and development with the ultimate objective of enhancing the welfare of its citizens. This has prompted development economics to propose a paradigm shift from Pro-Poor Growth to inclusive growth.

Nigeria faces an ongoing challenge of making its decade-long sustained growth more inclusive, in spite of many, and frequently changing, fiscal, monetary and other macro-economic policies, Nigeria has not been able to harness her economic potentials for rapid economic development. The economy has also witnessed times of expansion and contraction but evidently, the reported growth has not been a sustainable one.

Risks to Nigeria's economic growth are the sluggish recovery of the global economy, uncertainty and volatility in Oil revenues which is the mainstay of Nigeria's foreign earnings, precipitous rise in inflation rate, security challenges in the country, weak infrastructure base, especially power and transport, lack of human capital development initiative, corruption, lack of innovation and sound institution, poor implementation, policy inconsistency and poor governance among others, has been identified as the most binding constraint on real sector growth.

In the light of the above challenges, the question here is: Can monetary policy facilitate Nigerian economic growth move, from the historical sluggish growth trends to a vibrant growth path that can transform the structure of the economy and enable her to attainment the key objectives of inclusive growth and launch the country onto a path of sustained and rapid socio-economic development as targeted based on a dynamic comparative analysis of the country's potential growth rate.

Many studies have been carried out in the past on the nexus between monetary policy and it impact on the economy. However, review of previous empirical literature revealed a lack of consensus in the study findings of past researchers. The lack of agreement by past scholar leaves a research gap which indicated that more studies are required on this subject. This study therefore investigates the impact of monetary policy on the Nigerian economic growth, using time series data covering 1981 to 2020 as a contribution to fill that research gap.

The study employed Growth Rate of Gross Domestic Product (GRGDP) as proxy for economic growth as the dependent variable, while Broad Money Supply (MS2), Monetary Policy Rate (MPR), Liquidity Ratio (LQR), Inflation (INF) and Exchange Rate (EXCH) were used as independent variables as well as proxies for monetary policy tools in the model. The objective of the study is to determine the effect of monetary policy variables on real gross domestic product. The significance of the study is propelled by the fact that it was driven by the need to establish a real nexus between monetary policy and economic growth as every stakeholder in the economy is desirous of fast-tracking growth and development in the economy. In the concluding analysis, the findings of this study would be of immense benefit to the monetary policy authorities, the policy makers in government, the academia and the general public.

Given the crucial role played by monetary policy in pursuit of a sustainable economic growth in some countries, hence the cardinal objective of this study as stated earlier is to analyze the impact of Monetary Policy and economic growth in Nigeria between 1981 and 2020. Quarterly Data were used and were collected from Central Bank of Nigeria's Statistical Bulletin of various years and World Bank National Account Data.

The rest of the paper is organized thus: the introduction has been done above, next is section two which deals on theoretical and empirical literature review. Section three covers the methodology adopted for the research, and the results of data analysis and discussion of findings are covered in section four, while Section five ends the paper with conclusion and recommendation.

2 Theoretical and Empirical Literature Review

2.1 Theoretical Framework

The theoretical underpinning of this study is anchored on the monetarist theory, drawing its foundation from the Quantity Theory of Money (QTM), it assumes that velocity in the quantity theory of money is generally stable, which implies that nominal income is largely a function of the money supply (Friedman and Schwartz, 1963; Friedman 1968, 1970).The monetarist believe that money supply is the critical factor affecting the economic well-being of a nation (Friedman, 1974). This implies that the effective and efficient use of monetary policy tools would provide the needy impact on the economy. They posit that movement or variation in money supply are the most crucial determinants of economic growth(Etale and Oweibi, 2019) They also upheld the principle of trade-off between inflation and output as indicated by Phillip curve however, itwas reformulated in terms of real wage and not nominal wages (Gottschalk, 2005).

According to monetarists, inflation is always and everywhere a monetary phenomenon. This monetarist assertion is based on the quantity theory of money which states that price level is determined by the quantity of money available. This theory can be written as MV =PY , where M is nominal quantity of money supplied, V is the velocity of money, P is price level and Y is real output(Akalpler and Duhok, 2018)

The theory contended that the demand for money is stable and is not sensitive to variations in the rate of interest. They believe in an indirect government intervention through the use and manipulation of monetary instrument and tools. For them 'money' exerts the power to control the economy. Thus, expansionary monetary policy would create surplus of money which household will immediately spend, hence increasing aggregate demand. The theory notes that the economy may not always be operating at the full employment level of the real GDP as espoused by the classicals. Therefore, in the short run, monetarists argue that expansionary monetary policy may increase the level of real GDP by increasing aggregate demand, (Twinoburyo and Odhiambo, 2017).

2.2 Empirical Literature Review

There are various studies that have been done to test and assess the impact of monetary policy on economic growth in Nigeria and other countries of the world, using various econometrics techniques and methods. The findings of these researchers have showed different results, thus one can say empirical evidences of previous studies have revealed many diverse finding.

Efanga et al (2020) studied the impact of monetary policy on economic growth of Nigeria from 1981 to 2018 using Error Correction Model. Real GDP was the dependent variables while the independent variables were Cash Reserve Ratio (CRR), Monetary Policy rate and Interest Rate. The finding revealed that a unit rise in CRR would lead to a rise in economic growth in Nigeria by approximately seven units. The observation was in tandem with economic theory as part of monetary policy objectives is to achieve price stability and sustained economic growth. The paper recommended that monetary authorities should give significance attention to CRR as a monetary policy tool as it will engender the needed economic stabilization in Nigeria.

Sean (2019) using money supply, inflation and exchange rates as variables representing monetary policy observed a positive correlated between the variables and economic growth in Cambodia. However, for the interest rate variable, the results revealed a negative correlation with Cambodian economic growth.

Ibrahim (2019) using quarterly data from 1986:Q1- 2018:Q4, analyzed the impact of monetary policy on economic growth in the Nigerian economy. The Autoregressive Distributed Lag (ARDL) model and the Granger causality test were employed to assess the impact. The results showed that the monetary policy rate (MPR) had an insignificant positive effect on economic growth. The broad money supply-M2 was highly significant had a positive impact on the growth of the Nigerian economy. The paper recommended that the monetary authority in Nigeria should ensure a holistic monitoring of monetary instruments and aggregates and not only focus inflation targeting.

Etale and Oweibi (2019) analysed the nexus between monetary policy and economic growth in Nigeria between 2000 to 2017. The empirical results indicates that all the independent variables represented by broad money supply, interest rate and liquidity ratio had positive and significant effect on economic growth except cash reserve ratio which had negative and insignificant association with GDP. Thus, it was recommended that monetary policy authorities should ensure general stability in broad money supply, maintenance of stable interest rate regime and liquidity position. It further recommended that sound monetary policies should be put in place to direct the flow of funds to highly productive sectors to spur growth in the economy

Ayodeji and Oluwole (2018) assessed the effect of monetary policy on economic growth in Nigeria from 1981 to 2016 employing annual time series data. Vector error correction model (VECM) was deployed for the analysis, the results indicated that two variables (money supply and exchange rate) had a positive but lightly insignificant effect on economic growth, while liquidity ratio and interest rate were negative significant determinant of economic growth

Ufoeze et al (2018) investigated the effect of monetary policy on Nigerian economic growth between 1986 to 2016. Using Multiple regression on annual time series data, the findings of this research indicated that the interest rate, and investment have positive but insignificant effect on economic growth in Nigeria. Money supply was positive and significant to growth in Nigeria. Exchange rate has significant though a negative impact on GDP. Money supply and investment granger cause economic growth, while economic growth causes interest rate in Nigeria. They concluded that monetary policy explains 98% of the variations in economic growth in Nigeria

Ekwe, Ogbonnaya and Omodero, (2017) investigated the effect of monetary policy on economic growth in Nigeria employing secondary data obtained from the Central Bank of Nigeria from 1996 to 2016. GDP proxied for economic growth and same as the dependent variable, while the independent variables were broad money supply and credit to private sector which were proxies for monetary policy. Deploying multiple regression technique based on the SPSS computer software as the statistical tool for data analysis. The authors opined that monetary policy had no significant impact on economic growth.

Anowor and Okorie (2016) examined the effect of monetary policy on the Nigerian economic growth from the period 1982 to 2013. Secondary time series data were used and the proxies for Monetary policy were: interest rate, cash reserve ratio, and monetary policy rate. Employing Unit root test, Johansen co-integration test and Error Correction model. (ECM). The finding indicted that cash reserve ratio had positive effect on GDP, while monetary policy rate and interest rate and monetary policy rate had negative nexus with GDP. The study recommended that monetary authorities should place importance on the handling cash reserve ratio.

Okoro (2013) analyzed the effect monetary policy on Nigeria economic growth by examining the impact of money supply, inflation, interest rate, exchange rate, and credit on Gross Domestic Product. Unit root test was performed using the Augmented Dickey Fuller (ADF) and Philips–Perron Unit Test. Co-integration test and Error Correction Model (ECM) techniques were further utilized for the analysis. The results indicated the presence of long–run equilibrium nexus between monetary policy instruments and economic growth in Nigeria.

Fasanya, Onakoya and Agboluaje (2013) explored the effect of monetary policy on economic growth in Nigeria from 1975 to 2010. Using a time-series data, the effects of stochastic shocks of all the endogenous variables were assess using Error Correction Model (ECM). The result revealed the existing of a long-run relationship amongst the variables. Moreso, the core finding of this study indicated that, exchange rate, inflation rate and external reserve are significant monetary policy instruments that drive economic growth in Nigeria

Hameed et al. (2012) investigated how the decisions of monetary authorities impacts on macroeconomic variables like, money supply, interest rates, inflation, exchange rates and GDP. The study employed the method of Ordinary Least Square (OLS) and it was observed that tight monetary policy (in term of increasing the rate of interest) had significantly negative effect on output, thus, declaring that increase in money supply has strong positive effect on inflation but affects output negatively. Also, exchange rate was noted to be negatively connected to output.

Amassoma, Nwosa and Olaiya (2011) in their study of the impact of monetary policy on macroeconomic variables in Nigeria from 1986 to 2009 employed a simplified Ordinary Least Squared technique, performed unit root and co-integration tests. The result obtained indicated that monetary policy has seen the execution of many policy initiatives and has therefore undergone constant improvement over the years. The paper concluded that for monetary policy to accomplish its other macroeconomic objective such as sustained economic growth, it is expedient to decrease excessive government expenditure and align fiscal policy along with monetary policy stance.

3. Methodology

The econometrics methodology espoused in this study is the Auto-Regressive Distributed Lag (ARDL) technique developed by Pesaran and Smith (1998), Persaran and Shin (1999) and Pesaran et al. (2001) .The rationale for choosing this method is based on two main advantages which includes that: it is the most suitable for estimating long-term links for small samples. The other advantage is that ARDL model, is good for estimating variables with different levels of co-integration ieI(0) and I (1).

Quarterly Time series data from 1981 to 2020 were adopted, the data were obtained from World Bank National Account data and CBN statistical bulletin. For stationarity test, the Augmented Dickey-Fuller (ADF) Unit Root Test became handy. The research further estimated the Error Correction Model (ECM) to verify the speed of adjustment of the parameters back to their equilibrium path, if they deviate from their equilibrium path. Finally, post estimation diagnostic test for serial correlation, heteroscedasticity, Stability test were performed.

3.1 Model Specification and Definition of Variables

The model used in this study is built based on the adjustment of the model in Twinoburyo and Odhiambo (2017). The model specifies the endogenous variable which is Growth Rate of Gross Domestic Product (GRGDP) as a function of the Broad money supply (MS2), Monetary Policy Rate (MPR), Inflation (INFL), Liquidity Ratio (LDQR) and Exchange Rate (EXCH). The model is specified as follows:

GRGDP=f(MS2, MPR, INFL, LDQR, EXCHR,).....(l)
The above was transmogrified into an econometric model, we then have :
$GRGDP= \beta_0+ \beta_1 MS2+ \beta_2 MPR + \beta_3 INFL + \beta_4 LDQR+ \beta_5 EXCH + U_t$..... (2)
β_0 is the intercept or constant term.
β_1, β_2, β_3, β_4 and β_5 are non-negative, estimating parameters of the model

3.2 ARDL Cointegration Approach

In order to test the long run relationship among the variables, this study did not use the well-known Engle and Granger (1987) and Johansen and Juselius (1990) approaches to co-integration, rather it make use of a novel and advanced approach known as autoregressive distributive lag model (ARDL) bounds testing approach developed by Pesaran et al. (2001) to test whether long run relationship exist between the variables or not. This approach is newly embraced because it is valid if the variables of interest have vague order of integration i.e. purely I(0), purely I(1) or I(0) / I(1) which is not acceptable in previous approaches. Also, as maintained by Haug (2002), ARDL bounds testing approach is more appropriate and gives better results for small sample size while the short and long-run parameters can be estimated simultaneously. Hence, the ARDL representation of equation 2 can be presented as thus:

$$\Delta GDPGR_t = \beta_0 + \beta_1 GDPGR_{t-1} + \beta_2 MPR_{t-1} + \beta_3 LM2_{t-1} + \beta_4 INF_{t-1} + \beta_5 LDQR_{t-1} + \beta_6 EXR_{t-i} + \beta_7 \Delta GDPGR_{t-i} + \beta_8 \Delta MPR_{t-i} + \beta_9 \Delta LM2_{t-i} + \beta_{10} \Delta INF_{t-i} + \beta_{11} \Delta LDQR_{t-i} + \beta_{12} \Delta EXCH_{t-i} + \mu_t \ldots\ldots\ldots\ldots (3.2)$$

Where; Δ is the first-difference operator, and β's shows the long run coefficients and short run coefficients. Hence, the null hypothesis (H_0) of no cointegration states that, H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{11} = \beta_{12} = 0$ and the alternative hypothesis of existence of co-integration state that; $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$ $\beta_{11} \neq 0$ $\beta_{12} \neq 0$.

The above hypothesis is tested by comparing the calculated F-statistic with critical values from Narayan (2005) which were produced for small sample sizes of between 30 and 80 observations on the assumption that all variables in the model are I(0) in one side and that all the variables are I(1) on the other side. Following the norms of hypothesis testing, if the calculated F-statistic exceeds the upper critical bounds value, then the H_0 is rejected and we accept H_1, while if the F-statistic falls within the bounds then the test is inconclusive and lastly if the F-statistic falls below the lower critical bounds value, it implies that there is no co-integration.

3.3 ardl error-correction model (ardl-ecm) approach

With co-integrated variables, causal relations among variables can be within the reviewed framework of ECM (Granger, 1978). This presents simultaneously the short run and long run nexus among the variables. The individual coefficients of the lagged terms justify the short run dynamics in the model, while the error correction term (ECT) present the information of long run relationship. Similarly, the significance of lagged explanatory variable depicts short run causality while a negative and statistical significant ECT is assumed to signify long run causality. The short-run causality model from the ARDL model is presented in equation 3.3;

$$\Delta GDPGR_t = \beta_0 + \beta_1 \Delta GDPGR_{t-i} + \beta_2 \Delta MPR_{t-i} + \beta_3 \Delta LM2_{t-i} + \beta_4 \Delta INF_{t-i} + \beta_5 \Delta LQDR_{t-i} + \beta_6 \Delta EXCH_{t-i} + \rho ECM_{t-1} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.3)$$

Where, Δ is the difference operator, ECM represent the Error Correction Term (ECT) derived from the long-run co-integrating relation from specified ARDL models equation 3.2. In equation 3.3, ρ should exhibit a negative and significant sign for causality to exist in the long run.

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Lastly, the stability of the model is tested using the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests. This is based on the assertion of Narayan (2005) who maintained that, after the error correction models have been estimated, Pesaran and Pesaran (1997) suggest applying the cumulative sum of recursive residuals (CUSUM) and the CUSUM of square (CUSUMSQ) tests to assess the parameter constancy.

4.0 Data Analysis and Interpretation

The data analysis begins identifying the statistical properties of the variables as well as the trend analysis as presented in table 4.1

Table 4. 1 Descriptive Statistics

	GRGDP	MS_2	MPR	INFL	LDQR	EXCH
Mean	3.076250	7011.396	12.93438	19.57510	48.86788	131.7853
Median	3.925227	1187.617	12.62208	12.58824	46.90402	107.0757
Maximum	16.54259	39722.10	26.00729	78.89111	108.4304	394.3620
Minimum	-14.99757	15.83309	5.392455	-1.489657	27.65392	0.597231
Std. Dev.	5.483134	9992.351	3.840300	18.27538	13.79154	140.8958
Skewness	-0.806988	1.393897	0.629750	1.708939	1.689295	0.769882
Kurtosis	4.572770	3.933483	3.924141	5.069731	7.785002	1.996507
Jarque-Bera	33.85682	57.62122	16.26920	106.4378	228.7407	22.51915
Probability	0.000000	0.000000	0.000293	0.000000	0.000000	0.000013
Sum	492.2000	1121823.	2069.500	3132.016	7818.861	21085.65
Sum Sq. Dev.	4780.296	1.59E+10	2344.917	53104.34	30242.82	3156408.
Observations	160	160	160	160	160	160

Source: Author's Computation using Eviews 10

The descriptive statistics above, includes the mean, standard deviation, minimum and maximum, etc. From table above, the mean GRGDP of Nigeria during the period under study, is 3.076250 while the average of MS2, MPR, INFL LDQR and EXCHR were 7011.396, 12.93438, 19.57510, 48.86788 and 131.7853 respectively. The maximum GRGDP is 16.54259 while its minimum was -14.99757. For MS2, the value for the minimum is 15.83309 its maximum value is 39722.10. The maximum value of MPR was 26.00729 while the minimum is 5.392455. The maximum and minimum values of INFL is 78.89111 and -1.489657 respectively. The maximum and minimum values of LDQR is 108.4304 and 27.65392 respectively. Finally, the maximum and minimum values of Exchange Rate had a maximum value of 394.3620 and minimum value of 0.597231.

4.1 Presentation of Unit Root Results

Results of unit root

The Augmented Dickey Fuller (ADF) unit root test was espoused to test for stationarity of all the variables. The findings are offered on the table 2 below:

Table 2

Variable	P-value@ level	t-statistic @level with constant	t-statistic @level with Constant & Trend	Pvalue @1st Difference	t-statistic @1st Difference with Constant	t-statistic @1st Difference with constant and Trend	Order of Integration
GRGDP	***0.0455***	-2.9197	-2.8274	***0.0001***	-4.7090	-4.9486	I(0)
MS2	***0.5863***	-1.3890	-0.6372	***0.0337***	-3.0394	-3.5165	I(1)
MPR	***0.0066***	-3.6139	-3.7403	***0.0100***	-3.4756	-3.5504	I(0)
INFL	***0.2747***	-2.0280	-2.4463	***0.0000***	-5.8741	-5.8530	1(1)
LDQR	***0.0110***	-3.4442	-3.7280	***0.0000***	-5.4846	-5.6924	I(0)
EXCH	***0.9948***	0.8623	-1.6601	***0.0445***	-2.7781	-3.4874	1(1)

Source: Author's Computation using Eviews 10

The unit root test showed that GRGDP, MPR and LDQR were stationary at level while MS, INFL, EXCH were stationary at first difference. In the light of the above result, which not all the variables were stationary at level, we can infer the presence of unit root and co-integration of variables. Therefore, to ensure that there is no misinterpretation bias that usually comes when evaluating co-integrated variables using the OLS method, the paper proceeded to tested for cointegration employing the Auto-Regressive Distributed Lag (ARDL) cointegration bound test.

Table3: ARDL Bound Co-Integration Test

Estimated Model	F-Statistics 3.98	
	K 5	
Critical Values	**Lower Bound I(0)**	**Upper Bound I(1)**
1%	3.06	4.15
5%	2.39	3.38
10%	2.08	3

Source: Author's Computation using Eviews 10

The results as contained in Table 3 above, indicates that the value of the F-statistics is 3.98, which is higher than the upper bound I (1) critical value at 5%, we therefore reject the null hypothesis and infer the presence of co-integration amongst the variables, we therefore, advanced to estimate the long run ARDL regression.

Table 4.4: ARDL Regression Long Run Estimates

Variables	**Coefficients**	**Std. Error**	**t-Statistics**	**Prob.**
LMS_2	-2.076078	3.043893	-0.682047	0.4964
MPR	1.177248	0.748685	1.572421	0.1182
INFL	-0.423735	0.249347	-1.699379	0.0916
LDQR	0.136173	0.221972	0.613468	0.5406
EXCH	-0.000909	0.064781	-0.014034	0.9888
C	-0.024938	0.004622	-5.395828	0.0000

Source: Author's Computation using Eviews 10

4.2 Analysis of the Long run model

The ARDL regression estimates from Table 4 above, shows the long run estimates, it reveals that Broad Money supply (MS_2) is negative and insignificant in determining GRGDP at 5% Monetary Policy Rate which is the anchor interest rate in Nigeria has a positive effect on GRGDP though not significant in the long run. Inflation indicates a negative and insignificant nexus with GRGDP in the long run. For Liquidity Ratio (LDQR), it shows that, it is positive and an insignificant determinant of GRGDP at 5% level of significance, in the long run. The findings also indicates that Exchange Rate (EXCH) is negatively linked and has no significant impact on GRGDP at 5% level of significance in the long run.

Specifically, the findings demonstrates that a one percent increase in MS2, INFL and EXCH is expected to decrease the GRGDP by 2.07, 0. and 0.0009 percent respectively while a percent rise in MPR and LDQR is likely to increase the GRGDP by 1.18 and 0.423 percent respectively.

The negative relationship between Broad Money Supply and Economic growth is in line with the findings of Srithilat and Sun (2017), Nasko (2016), Aslam (2016), Ebiringa, Onuorah and Obi (2014) however, it is contrary to the findings of Ayodeji & Oluwole (2018) Inam & Ime (2017) and Sulaiman&Migiro (2014)

It is expedient to note that the long run result of a positive relationship between Monetary Policy Rate and economic growth is not a strange or a novelty in the Nigerian economy. As similar negative relationship has earlier been established by previous studies on the subject matter, including Ibrahim (2019). Etale et al. (2019) and Ufoeze et al (2019), nevertheless the result is contrary to the observations of Chipote and Makhetha-Kosi (2014)

4.3Analysis of the Error Correction Model or Short run model

The ARDL regression estimates is the Error Correction Model presented as **Appendix 1:**

The short-run result revealed that one percentage change in money supply in the short-run will lead to -25.27063 percentage change in GRGDP. Also, one percent change in money supply in lag one and two will lead to 29.43127 and -9.984021 percent changes in GRGDP. The results were significant as indicated by their probability values which were lower than 0.05 (conventional 5% level of significance)

The short-run result revealed that one percentage change in inflation rate in the short-run will lead to -0.198617 percentage change in GDPGR. Also, on percent change in inflation rate in lag one and two will lead to 0.248488 and 0.102059 percent changes in GDPGR. The results were significant as indicated by their probability values which were lower than 0.05 (conventional 5% level of significance)

Also, one percentage change in exchange rate in the short-run will lead to -0.088099 percentage change in GDPGR. While one percent change in exchange rate in lag one and two will lead to 0.105023 and -0.045428 percent changes in GDPGR. The results were significant except at lag 2 as indicated by their probability values which were lower than 0.05 (conventional 5% level of significance).

The estimated coefficient of the error correction term is highly significant. Furthermore, the magnitude of the estimated coefficient of the error correction term suggests a relatively low speed of adjustment to any disequilibrium in the short run. In other words, the estimated ECT_{t-1} is equal to 0.02 which states that the departure from the equilibrium is adjusted by 2% per year.

4.4 Post Estimation Diagnostic Tests

4.4. 1 Serial Correlation

Breusch-Godfrey Serial Correlation LM Test: Result			
F-Statistic	3.162588	Prob. F(1, 132)	0.0776
Obs*R-Square	3.556556	Prob. Chi-Square (1)	0.0593

Source: Author's Computation using Eviews10

From the result of the Breusch-Godfrey Serial Correlation LM test above, accepted the null hypothesis of no serial correlation in the residual, since the probability of its F-statistic value is 0.0776 cent which is greater than the 5% level, hence concluding that the model is free from the problem of autocorrelation

4.4.2 Heteroskedasticity Test:

Breusch-Pagan-Godfrey Test Result			
F-Statistic	0.905046	Prob. F(28,7)	0.6127
Obs*R-Square	28.20810	Prob. Chi-Square (28)	0.4535

Source: Author's Computation using Eviews10

From the result of the Breusch-Pagan-Godfrey test above, accepted the null hypothesis of no hetroscedascity in the residual, since the probability of its F-statistic value is 0.6127 cent which is greater than the 5% level, hence concluding that the model is free from the problem of hetroscedascity .

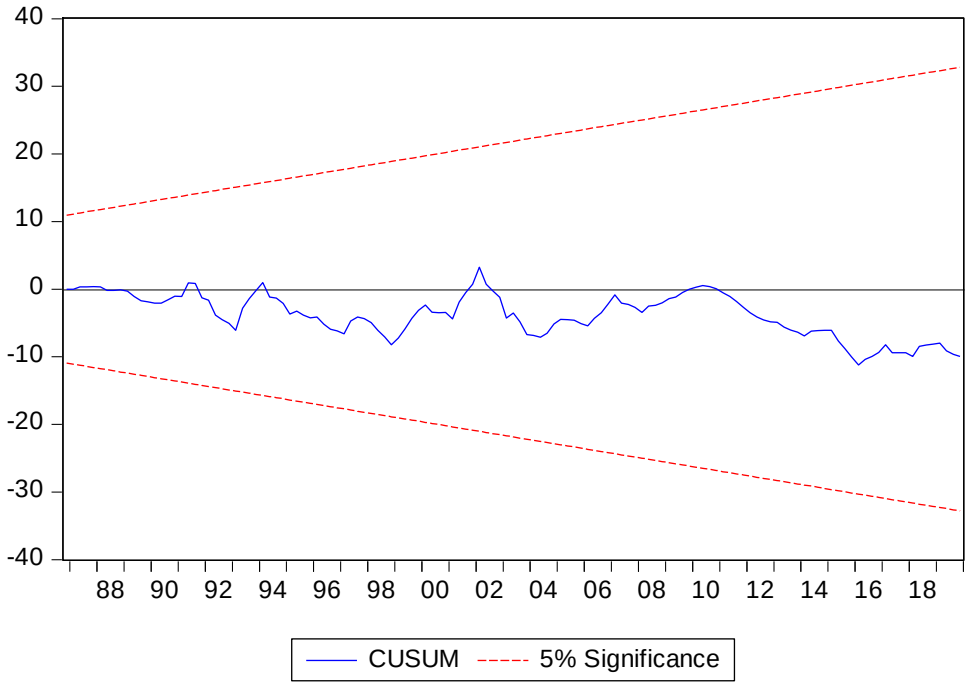
4.4.3 Residual Specification Error Test:

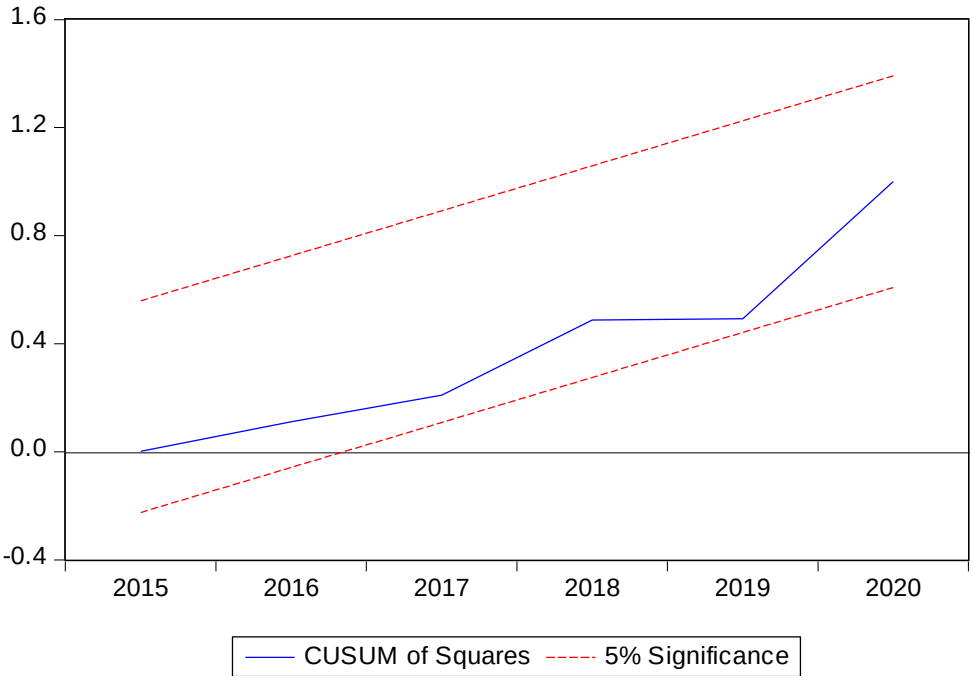
Ramsey RESET Test Result			
t-Statistic	1.197507	df. 132	Prob. 0.2333
F-Statistic	1.434024	df. (1, 132)	Prob. 0.2333

Source: Author's Computation using Eviews10

The Ramsey's RESET Test (Residual Specification Error Test) was conducted to test if the model was miss specified. The decision remains that, if the P-value of the computed F-statistics is more than 0.05 we accept the null hypothesis, which says that the model is correctly specified. From the result above, since the Prob is (0.233), we note that the model was not mis specified

4.4.4 Stability Test - CUSUM test and CUSUMQ





The stability of the model was tested using Cumulative Sum of Recursive Residual stability (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMQ) within the 5% critical lines. The result showed that the model is stable and confirms the stability of the long-term coefficients of the regressors and therefore the model is fit for use in decision making in Nigeria.

5. Conclusion and Recommendation

5.1 Conclusion

This study assessed the effect of monetary policy and economic growth in Nigeria from 1981 to 2020. The independent variables were Monetary Policy Instruments, proxied by Broad Money Supply (MS2),

Monetary Policy Rate (MPR), Inflation (INFL), Liquidity Ratio (LDQR)and Exchange Rate (EXCH) while economic growth was proxied by Growth Rate of Gross Domestic Product (GRGDP) and was the dependent variable. Annual reports of Central Bank of Nigeria (CBN) Statistical Bulletins and World Bank Annual Account Data were sources for the quarterly Time series. The study employed descriptive statistics and unit root test. The result of the Unit root showed that GRGDP, MPR, LDR were stationary at levels while MS2, INFL and EXCH were stationary at first difference. The study further employed Autoregressive Distributive Lag (ARDL) bound test , Error Correction model and some diagnostic tests were performed using Eviews 10.

The empirical results from the long run estimates showed that Broad Money Supply has a negative but insignificant effect on growth rate of gross domestic product, proxy for economic growth, this in line with the findings of Srithilat and Sun (2017), Nasko (2016) and Aslam (2016). Monetary Policy Rate which is one of the main monetary policy instruments used by the Monetary Policy Committee of the CBN has positive impact on economic growth though not significant, this finding is in tandem with the findings of Ibrahim (2019). Etale et al. (2019) Ufoeze et al (2019). For Inflation the relationship was negative, to economic growth though insignificant. Impact of liquidity ratio of banks to economic growth was positive but not significant, the positive association of liquidity ratio to economic growth conforms with the finding of Etale et al. (2019).While Exchange Rate revealed an insignificant negative nexus with economic growth.

Finally, the study concludes that the results suggest that monetary policy may not be the only key driver of economic growth in Nigeria. Overall, the findings may be explained by the structure of the Nigerian economy, which is characterized by a low level financial inclusion, dominance of banks and financial Institutions in the urban areas leaving majority of citizens in the rural area out of the financial system, thus making monetary policy instruments ineffective in achieving its set objectives.

5.2 Recommendations

In the light of the aboveand the analysis in section 4 the following recommendations/suggestions are proposed:

1. Monetary policy authorities should strived to ensure that there is a handshake and proper coordination with the fiscal policy authorities to enhance higher economic growth in the economy
2. The Monetary Policy authorities should give Monetary Policy Rate priority attention to enable it drive economic growth. It should also persuade lenders not to lend at extremely high interest rate .
3. Government and the monetary authority should pursue policies that would engender increase in financial inclusion and intentionally create easy access to financial product and institutions at low cost to enhance the effectives of monetary policy in the economy.

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APPENDIX 1

ARDL Error Correction Regression
Dependent Variable: D(GRGDP)
Selected Model: ARDL(4, 3, 0, 3, 0, 3)
Case 2: Restricted Constant and No Trend
Date: 07/25/21 Time: 14:09
Sample: 1981Q1 2020Q4
Included observations: 152

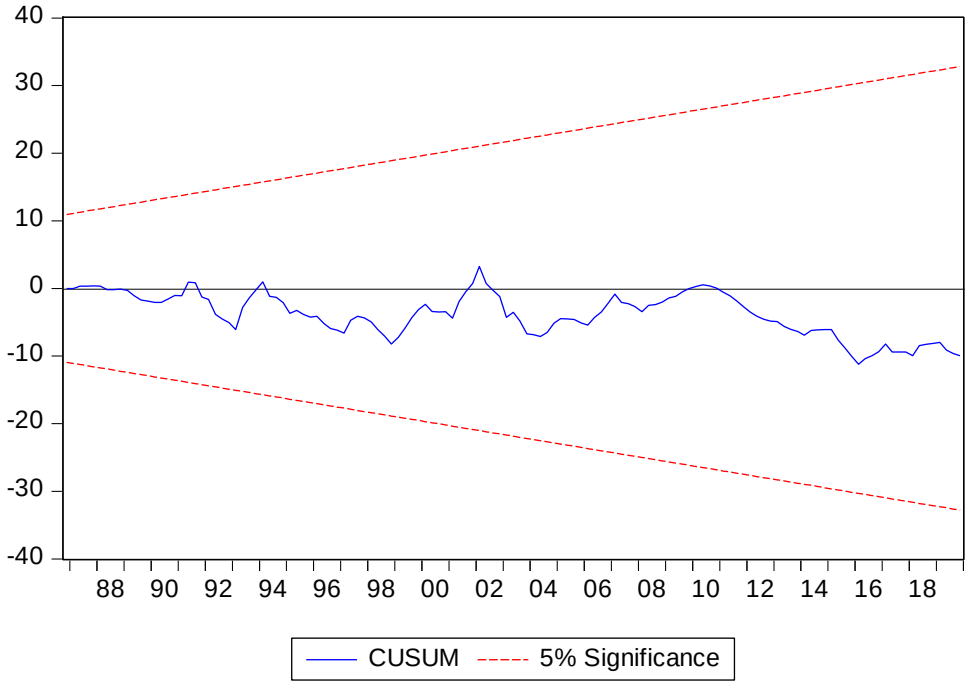
ECM Regression
Case 2: Restricted Constant and No Trend

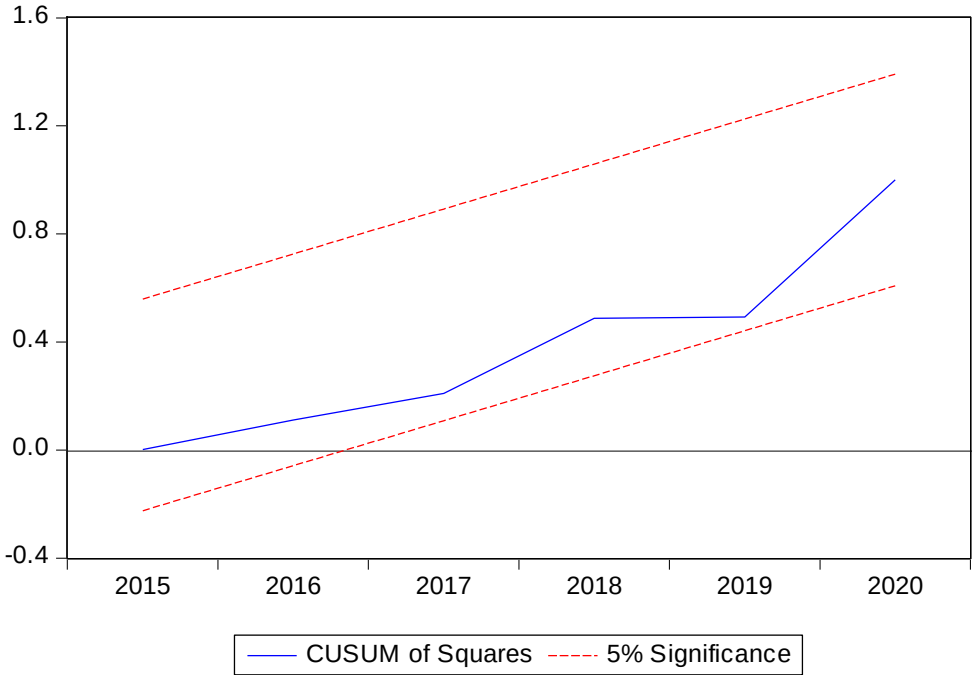
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(GRGDP(-1))	1.023899	0.073721	13.88879	0.0000
D(GRGDP(-2))	-0.288899	0.098446	-2.934587	0.0039
D(GRGDP(-3))	-0.300304	0.064604	-4.648380	0.0000
D(LMS_2)	-25.27063	4.340455	-5.822114	0.0000
D(LMS_2(-1))	29.43127	7.783184	3.781393	0.0002
D(LMS_2(-2))	-9.984021	4.592765	-2.173858	0.0315
D(INFL)	-0.198617	0.026878	-7.389516	0.0000
D(INFL(-1))	0.248488	0.046308	5.366008	0.0000
D(INFL(-2))	-0.102059	0.028417	-3.591509	0.0005
D(EXCH)	-0.088099	0.025885	-3.403470	0.0009
D(EXCH(-1))	0.105023	0.044620	2.353716	0.0201
D(EXCH(-2))	-0.045428	0.027023	-1.681069	0.0951
CointEq(-1)*	-0.024938	0.004622	-5.395828	0.0000

R-squared	0.900632	Mean dependent var	0.078814
Adjusted R-squared	0.892054	S.D. dependent var	1.675574
S.E. of regression	0.550513	Akaike info criterion	1.725713
Sum squared resid	42.12594	Schwarz criterion	1.984334
Log likelihood	-118.1542	Hannan-Quinn criter.	1.830774
Durbin-Watson stat	2.137057		

* p-value incompatible with t-Bounds distribution.

APPENDIX II


40
30
20
10
0
-10
-20
-30
-40
88 90 92 94 96 98 00 02 04 06 08 10 12 14 16 18
CUSUM
5% Significance


1.6
1.2
0.8
0.4
0.0
-0.4
2015 2016 2017 2018 2019 2020
CUSUM of Squares
5% Significance