Does Monetary Policy Induce Economic Growth? An Empirical Evaluation of the Nigerian Economy

Anthony Ilegbinosa Imoisi

Department of EconomicsFaculty of Arts, Management and Social Sciences Edo University Iyamho Edo State, Nigeria

mcanthonyby@yahoo.co.uk

Abstract

The goal of every economy is to attain the highest level of economic growth and development. Monetary and Fiscal policies are instruments which the government of any nation can employ to effectively achieve the desired growth of their respective economies. This study investigates the extent to which monetary policies can promote economic growth in Nigeria, covering the period of 1980-2016. In doing this, the study used secondary data from the Central Bank of Nigeria Statistical Bulletins and National Bureau of Statistics various issues. The econometric technique of ordinary least square (OLS), Johansen co-integration and the vector error correction model (VECM) were employed in analyzing the data collected for this study. The result showed that monetary policies did not have a significant impact on Nigeria's economic growth in the short run, but significantly affected the country's growth in the long run. The non-significance of the nation's monetary policies on economic growth in the short run is a strong proof of the gap between monetary policies formulation and implementation in Nigeria. Thus, it is recommended that the Central Bank of Nigeria should ensure to bridge the gap between monetary policy formulation and implementation. Furthermore, monetary policies should be employed to create favourable investment climate by aiding the emergence of market-based interest rate and exchange rate that will bring in both domestic and foreign investments. Finally, the Central Bank of Nigeria and the Federal Ministry of Finance should ensure there is efficient coordination of monetary and fiscal policies to spur economic growth in Nigeria.

Keywords: Monetary Policy, Money Supply, Interest Rate, Inflation Rate, Exchange Rate, Gross Domestic Product.

1. Introduction

Generally, the global influence of monetary policy cannot be overemphasized. Most nations employ it as a means to achieve their macroeconomic objectives such as economic growth, price stability, balance of payments equilibrium, full employment etc. Consequently, monetary policy is a top priority to the government of both developed and developing countries and Nigeria is no exception. The recognition of the macroeconomic significance of monetary policy in Nigeria dates back to decades past. For instance, during the Structural Adjustment Programme (SAP) monetary policy was incorporated into the country's macroeconomic policy and economic stability was achieved in that price distortions were eliminated and the excessive dependence of Nigeria on crude oil export was reduced (Gbosi 2005). This action had huge effect on raw materials and consumer's goods. In this regard, SAP became an avenue through which monetary policy was employed to curb the pressure mounted by inflation and even restrained the demand for available foreign exchange resources.

Monetary policy is portrayed as the art of managing the movement and direction of monetary and credit facilities in pursuit of stable prices and economic growth in the economy (CBN 1992). The Central Bank of Nigeria (CBN) is the monetary institution saddled with the responsibility to either regulate the output of or impose restrictions of the money stock to make sure the socio-economic and financial conditions of the people is in a satisfactory manner (Fasanya et al, 2013). For this to occur, monetary management becomes imperative since it specifies the focus of the policy. Imoisi et al (2013) opines that the focus of monetary policy is to make sure that money supply is at a level that is consistent with the growth target of real income, such that non-inflationary growth will be attained. Consequently, the CBN have designed measures to influence the supply of money and interest rate so that the economy can achieve a non-inflationary growth. Though these measures have given

Nigeria huge amount of economic benefits as well as produced a nice outlook of profitable monetary policies, the country nonetheless still fights with high rate of inflation, low GDP, high unemployment etc. Thus, the objective of this study is to investigate the impact of monetary policy on the economic growth in Nigeria

Over the past years, the implementation of monetary policy in Nigeria was harmful to, and inconsistent with the nation's development needs. This concern has exerted pressures on opinions to finding possible solutions. Though, the dualistic nature of the country's financial and product market constitutes a fundamental restraint opposing the formulation and efficient implementation of monetary policy. Consequently, the structural adjustment program was introduced in the economy to liberalize the financial system. However, in spite of the various monetary regimes that the Central Bank of Nigeria have adopted over the years, inflation still remains a key threat to Nigeria's economic growth as the country has experienced high volatility in inflation rates. Since the early 1970's, there has been more than three major incidents of high inflation in excess of 30 percent (CBN 2016). The growth of money supply in the country is correlated with these incidents of high inflation because it was frequently in excess of real economic growth. Thus, the Central Bank of Nigeria usually manipulates the total money in circulation and interest rate so as to control the rate of inflation in the economy. In addition, another sector that can influence money supply, monetary policy and inflation rate in the Nigerian economy is the informal sector. This sector accounts for about 30 percent of Nigeria's GDP and due to the existence of a huge informal credit market and exchange rate market in the economy, it has a lot of implications for the transmission mechanism of monetary policy. Furthermore, the payment system is a very important connection between the financial and the real sector of the economy. Nigeria's payment system is predominantly cash and the prominence of cash for transaction purposes increases the volume of money/currency in circulation thus making monetary control difficult (Adigwe et al, 2015). In the light of the above therefore, this study aims to subject these issues to empirical investigation in order to assess the impact of monetary policy on economic growth in Nigeria.

2. Theoretical Framework

2.1 Monetary Theory

This theory states that change in money supply is the major reason for changes in economic activities. When monetary theory is put into practice, central banks, which control monetary policy, can exercise a great deal of power over economic growth rates. The theory opines that if a country's money supply increases, economic activity will increase; the opposite is also true. This theory is directed by a formula, MV = PQ, where M is the money supply, V is the velocity, P is the price of goods and services, and Q is the quantity of goods and services. Assuming V is constant, when M is increased, either P, Q or both P and Q increase. When the economy is closer to full employment, the general price level tends to rise more than the production of goods and services. When the economy is moving slowly, Q will increase at a faster rate than P under this theory. In most developing countries, monetary theory is managed by the central government, which might also be conducting most of the monetary policy decisions.

2.2 Empirical Literature

Over the years the extent to which monetary policy affect economic growth has been under discussion by various scholars. It is important to review some empirical works of these scholars in order to appreciate the impact of the monetary policies on economic growth, particularly in Nigeria.

Nnanna (2001) opined that monetary management thrived in Nigeria during the era of financial sector reforms which is typified by employing indirect instead of direct monetary policy instruments; however, he contended that the effectiveness of monetary policy has been weakened by the impact of political interference, fiscal dominance, as well as the legal environment in which the Central Bank carry out its operations. Busari et al (2002) were of the opinion that monetary policy stimulates economic growth and makes the economy more stable under a flexible exchange rate regime than a fixed exchange rate regime, although it could destabilize the economy in a flexible exchange regime since it is accompanied by severe depreciation. Thus, monetary policy

would make the economy more stable, if it is employed to target inflation directly than employed to stimulate growth directly. Therefore, they recommended that other policy measures and tools are required to complement monetary policy in stabilizing the economy.

Adeyemo and Mobolaji (2010) examined the relationship between fiscal policy, monetary policy and economic growth in Nigerian by using the Jahansen co-integration procedure. Their findings illustrated that there is a long – run relationship between broad money supply (M2), government expenditure, degree of openness and economic growth. Onyeiwu (2012) investigated the influence of monetary policy on economic growth in Nigeria using Ordinary Least Squares (OLS) method. Their findings illustrated that monetary policy proxy by money supply has a positive and direct effect on GDP growth and balance of payments but negative effect on inflation rate. Thus, he concluded that the CBN's monetary policy was efficient in controlling the liquidity in the economy which has an effect on some macroeconomic variables such as prices, output and employment.

Bernhard (2013) investigated monetary transmission mechanism channels in Nigeria employing Granger casualty test to evaluate the relationship between various channels and selected macroeconomic aggregates. The result indicated that three transmission channels were useful for targeting inflation. They include exchange rate, interest rate and credit channels. Okoro (2013) assessed the effect of monetary policy on economic growth in Nigeria by analysing the impact of money supply, exchange rate, interest rate, inflation and credit on GDP by employing Augment Dickey Fuller (ADF) test, Philips–Perron Test, Co-integration test and Error Correction Model (ECM). The findings showed the existence of a long–run equilibrium relationship between the tools of monetary policy and economic growth. Owalabi and Adegbite (2014) looked at the influence of monetary policy on Nigeria's industrial growth with the aid of the multiple regression technique. They evaluated the relationship between rediscount rate, industrial growth, manufacturing output, treasury bills, deposit and lending. They discovered that the variables had significant impact on industrial growth in Nigeria.

2. Methodology

The study adopted a quasi-experimental design, and this shows that it is an empirical analysis on monetary policy and economic growth in Nigeria making use of annual time series data from secondary sources from 1980-2016. The researcher employed descriptive statistics, unit root test, Johansen co-integration test and vector error correction model test in evaluating the relationship between the dependent variable (Gross Domestic Product a proxy for economic growth) and the independent variables (money supply, interest rate, exchange rate and inflation rate). The data required for this research were gathered through library research and were obtained from the 2016 statistical bulletin of the Central Bank of Nigeria (CBN) and various issues of the National Bureau of Statistics (NBS).

3.1 Model Specification

The variables selected for the model were gotten from the literature. The model follows the contention of Onyeiwu (2012) and Okoro (2013). Particularly, the research examines monetary policy and economic growth in Nigeria. Corresponding to the above, the functional relationship between the variables is stated as thus:

GDP=f (MS, INTR, EXCR, INFL)

Where:

GDP = Gross Domestic Product which serves as a proxy of economic growth

MS = money supply

INTR = interest rate

EXCR = exchange rate

INFL = inflation rate

The equation above states that the Gross Domestic Product (GDP) is a function of money supply, interest rate, exchange rate, and inflation rate. Expressing this equation in a linear equation form with the error term μ incorporated into it becomes;

$GDP = \beta_0 + \beta_1 MS + \beta_2 INTR + \beta_3 EXCR + \beta_4 INFL + \mu$

In order to know how a percentage change in the independent variables (money supply, interest rate, exchange rate and inflation rate) brings about a change in the dependent variable (Gross Domestic), the equation above was logged and it becomes;

$LGDP = \beta_0 + \beta_1 LMS + \beta_2 INTR + \beta_3 LEXCR + \beta_4 INFL + \mu$

Where:

β_0 = constant term

μ = Error term. It takes care of all other factors not accounted for by the independent variables.

β_1 - β_4, are parameters for estimation. They measure the marginal effect of the explanatory variables on the dependent variable. The apriori expectation for the coefficient of the variables is as follows:

$\beta_1 > 0, \beta_2 < 0, \beta_3 > 0, \beta_4 > 0.$

4. Empirical Results and Discussion.

A variety of tests were performed. They are presented and discused in this section.

4.1 Trend Analysis of the Variables in the Model

Fig 1. Trend Analysis of Gross Domestic Product (GDP)

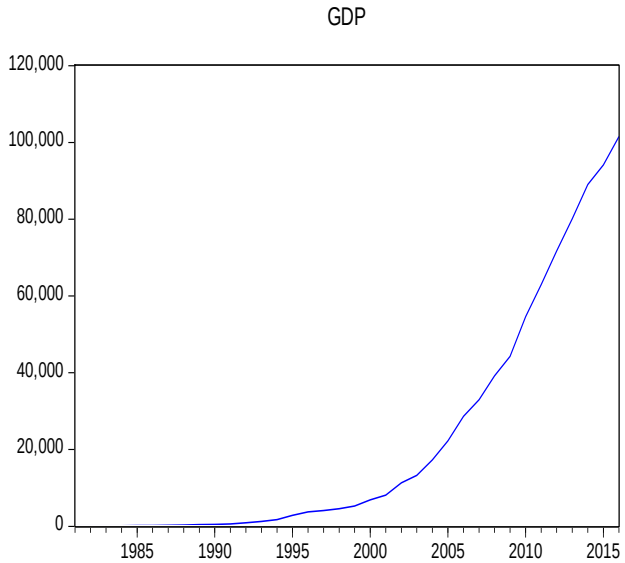


Fig 1 shows the trend analysis of gross domestic product (GDP) from 1980 to 2016 with the y axis representing the trend value in ₦ billions and the x axis representing the trend in years. It could be observed that the trend value have been in the positive increase from 1980 to 2004 on a decreasing rate and thereafter on an increasing rate.

Fig 2. Trend Analysis of Money Supply (MS)

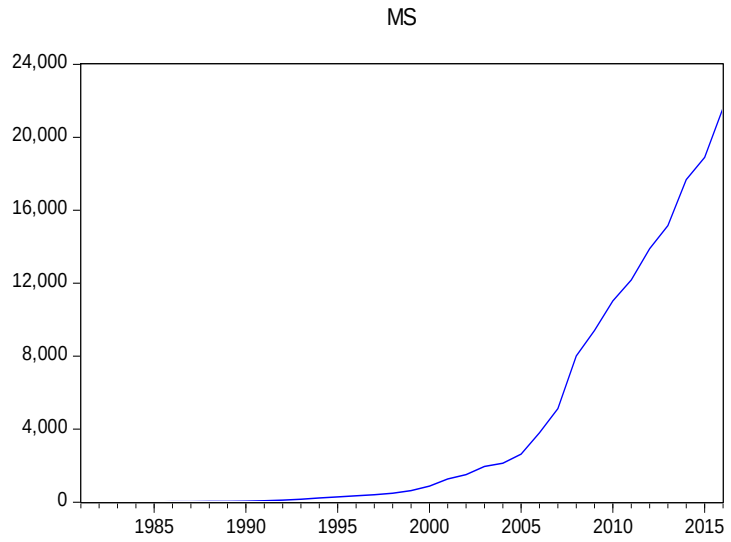


Fig 2 depicts the trend analysis of money supply (MS) from 1980 to 2016 with the y axis representing the trend value in ₦ billions and the x axis representing the trend in years. It could be noticed that the economy has experienced a steady increase in money supply from 1980 to 2005 with fluctuations increases in rate. From 2006 and beyond, the economy experienced a sharp increase in the stock of money in the economy with 2016 having the highest

Fig 3. Trend Analysis of Interest Rate (INTR)

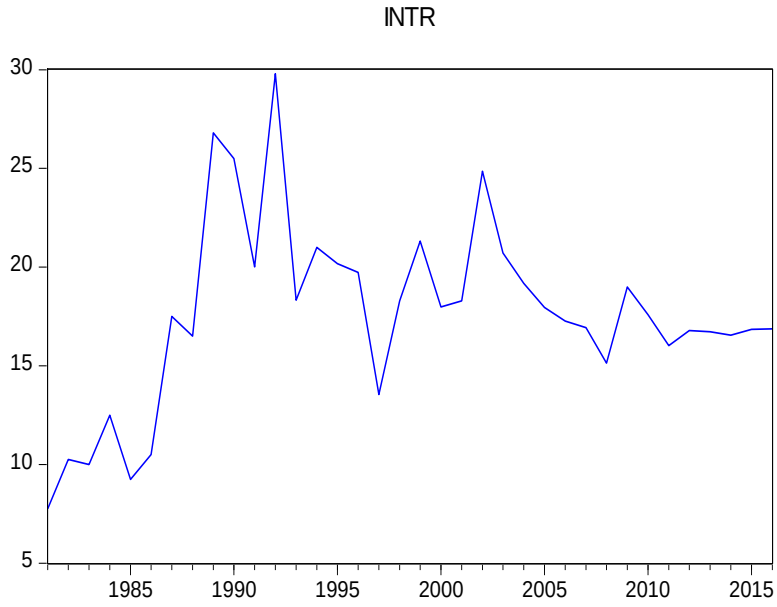


Fig 3 shows the trend analysis of interest rate (INTR) in Nigeria from 1980 to 2016 with the y axis representing the trend value in percentage and the x axis representing the trend in years. It could be noticed that interest rate experienced fluctuations in trend value from 1980 to 2016. However, it recorded its highest value of 29.80% in 1992 and its lowest value of 7.75% in 1980.

Fig 4. Trend Analysis of Exchange Rate (EXCR)

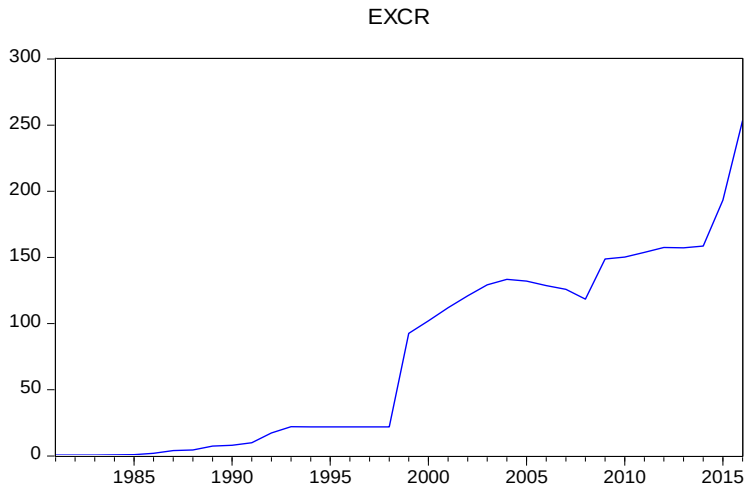


Fig 4 shows the trend analysis of exchange rate (EXCR) in Nigeria from 1980 to 2016 with the y axis representing the rate at which Nigerian Naira is exchanged for $1 (U.S. dollars) and the x axis representing the trend in years. It could be noticed that exchange rate also experienced fluctuations in trend value from 1980 to 2016. However, it recorded it highest value of 253.49 in 2016 and its lowest value of 0.61 in 1980.

Fig 5. Trend Analysis of Inflation Rate (INFL)

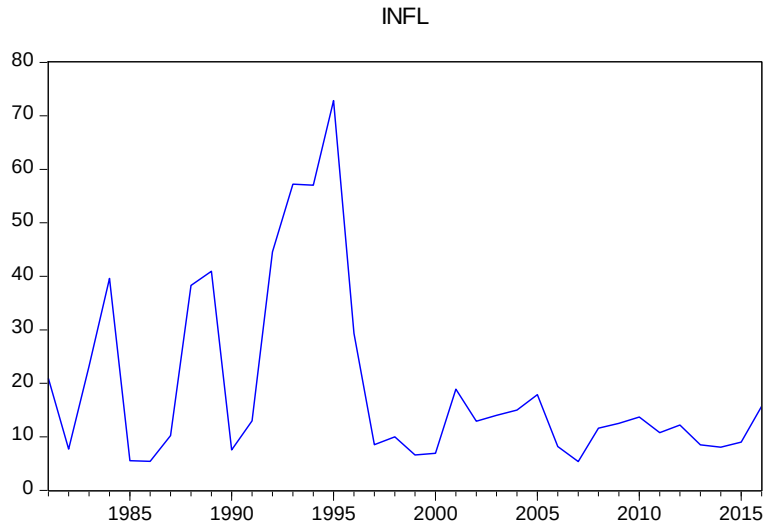


Fig 5 shows the trend analysis of inflation rate (INFL) from 1980 to 2016 with the y axis representing the trend value in percentage and the x axis representing the trend in years. It could be seen that inflation witnessed fluctuations in trend value from 1980 to 2016. However, it recorded it highest value of 72.84% in 1995 and its lowest value of 5.40% in 2007.

4.2 Data Analysis

4.2.1 Descriptive Statistics Analysis

The descriptive analysis of the macroeconomic variables employed in this research is presented in table 1 below.

Table1: Descriptive Statistics Analysis of the Variables in the Model

	LGDP	LMS	INTR	LEXCR	INFL
Mean	8.358554	6.357318	17.59528	3.293778	19.37001
Median	8.504133	6.317337	17.54500	3.811330	12.95345
Maximum	11.52771	9.980804	29.80000	5.535333	72.83550
Minimum	4.975561	2.672078	7.750000	-0.494296	5.400000
Std. Dev.	2.272897	2.482149	4.757283	1.947662	17.00227
Skewness	-0.136840	-0.037866	0.186892	-0.735479	1.623524
Kurtosis	1.590067	1.606743	3.475984	2.202203	4.746025
Jarque-Bera	3.094219	2.920350	0.549413	4.200297	20.38788
Probability	0.212862	0.232196	0.759795	0.122438	0.000037
Sum	300.9080	228.8635	633.4300	118.5760	697.3205
Sum Sq. Dev.	180.8122	215.6372	792.1111	132.7685	10117.70
Observations	36	36	36	36	36

Source: Author's Computation 2018

Table 1 gives some preliminary analyses that involve the explanation of pertinent statistical features of the variables under consideration. These analyses are performed with respect to the statistical distributions of the variables. From the table above, it can be observed that inflation rate has the highest mean, standard deviation, and maximum value, whereas exchange rate has the lowest mean, lowest median, lowest maximum value as well as lowest minimum value. Furthermore, it can be seen that all the variables are negatively skewed with the exception of interest rate and Inflation rate implying that they have long left tails. Also, considering the Kurtosis, from the table above, interest rate and inflation rate exceeds three therefore they are peaked or leptokurtic while gross domestic product, money supply and exchange rate are below three thus they are flat or platykurtic.

4.2.2 Unit Root Test

The unit root test was conducted, and the results are shown in table 2 below.

Table 2: Unit Root Test Result

Augmented Dickey-Fuller (ADF) Test				Phillip-Perron (PP) Test		
Variables	Level	1st Diff	Status	Level	1st Diff	Status
LGDP	-0.643937	-3.086821 **	I(1)	-0.549688	-3.005679**	I(1)
LMS	-1.121654	-3.297344***	I(1)	-0.289744	-3.315425 **	I(1)
LINTR	-1.368904	-5.809044***	I(1)	-1.382733	-9.402858***	I(1)
LEXCR	-1.934273	-5.022240***	I(1)	-1.081772	-5.022240***	I(1)
LINFL	-0.849158	-5.643984	I(1)	-0.783080	-9.657586***	I(1)

Source: Author's Computation 2018

Table 2 above shows the unit root test on the variables and it was performed using both the Augmented Dickey-Fuller (ADF) and the Philip-Perron tests. It was observed from the ADF test and the Philip-Perron tests that all the variables were not stationary at levels, but after their first difference, they became stationary, i.e. they were integrated of the order one.

4.2.3 Johansen Co-integration Test

The co-integration test was employed to see if there is a long run relationship between the dependent and independent variables. The co-integration test was performed using the Johansen technique and the result is shown below

Table 3: Test for Johansen Co-integration Using Trace Statistic

Hypothesized No. of CE(s)	Eigen Value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.657390	78.45920	69.81889	0.0087
At most 1	0.390928	42.03971	47.85613	0.1576
At most 2	0.334558	25.18189	29.79707	0.1550
At most 3	0.204696	11.33358	15.49471	0.1918
At most 4	0.099054	3.546525	3.841466	0.0597

Source: Author's Computation 2018

Table 4: Test for Johansen Co-integration Using Max-Eigen Value

Hypothesized No. of CE(s)	Eigen Value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.657390	36.41949	33.87687	0.0243
At most 1	0.390928	16.85782	27.58434	0.5922
At most 2	0.334558	13.84831	21.13162	0.3776
At most 3	0.204696	7.787057	14.26460	0.4008
At most 4	0.099054	3.546525	3.841466	0.0597

Source: Author's Computation 2018

From table 3 and 4 above, the Trace Statistic and Max-Eigen value indicates at least one co-integrating equation at 5 percent level. Based on the above tables, we reject the null hypothesis of no co-integrating equations. Thus, there is a long run relationship between the variables in the model i.e. between gross domestic product, money supply, interest rate, exchange rate and inflation rate**.**

4.2.4 Heteroscedasticity Test

The test asymptotically follows a chi-square distribution with degree of freedom equals the number of explanatory variables {excluding the constant term}. The auxiliary model can be stated as:

$Ut = \beta_0 + \beta_1 LGDP + \beta_2 LMS + \beta_3 INTR + \beta_4 LEXCR + \beta_5 INFR + \beta_6 LGDP^2 + \beta_7 LMS^2 + \beta_8 INTR^2 + \beta_9 LEXCR^2 + \beta_{10} INFR^2 + Vi.$

Where Vi = pure noise error.

This model is run and an auxiliary R^2 from it is obtained.

The hypothesis to the test is stated thus;

H_0: The error terms have a constant variance {Homoscedasticity}

H_1: The error terms do not have a constant variance {Heteroscedasticity}.

Decision Rule:

Reject the null hypothesis if $X^2_{cal} > X^2_{tab}$ at 5% level of significance. If otherwise, accept the null hypothesis. From the obtained results, X^2_{cal} 8.069175 {10} = 16.52062 < X^2_{tab} 0.05 {10} = 18.31, thus, we accept the null hypothesis of homoscedasticity showing that the error terms do have constant variance.

4.2.5 Auto correlation Test

The model is checked for autocorrelation using the Breusch-Godfrey Serial Correlation LM Test which is shown in table 5 below.

Table 5: Breusch-Godfrey Serial Correlation LM Test:

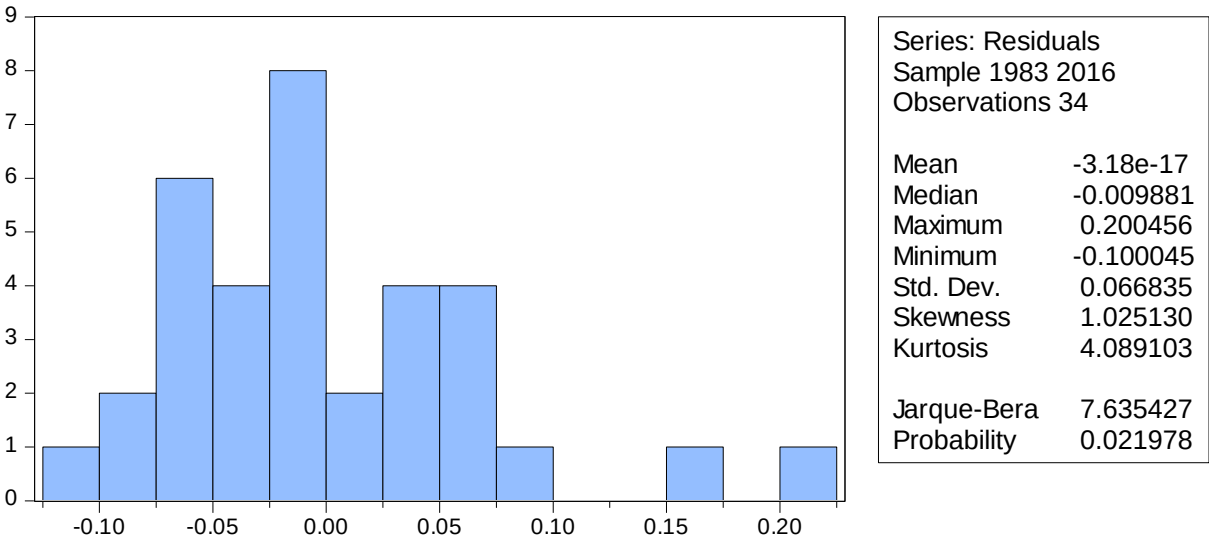
F-statistic	0.036998	Prob. F(1,26)	0.8490
Obs*R-squared	0.048314	Prob. Chi-Square(1)	0.8260

Source: Author's Computation (2018)

There is no evidence of serial correlation as the p-value (0.8260) is greater than the 0.05 level of significance.

4.2.6 Normality Test

The paper employed the Jargue – Bera (JB) test of normality. The JB test of normality is an asymptotic or large sample and is based on the OLS residuals. It computes the skewness and kurtosis measures of the OLS residuals and follows the chi square distribution (Gujarati, 2004).



Hypothesis

H_0: $\mu_1 = 0$ (The error term follows a normal distribution).

H_1: $\mu_1 \neq 0$ (The error term does not follow a normal distribution).

The normality test follows the chi-square distribution with two degree of freedom (df) at 5% level of significance.

Decision rule:

Reject H_0, if p- value of JB > 0.05 and accept, if otherwise.

From the result obtained from Jargue – Bera (JB) test of normality, JB = 7.635427 and p-value = 0.021978, Thus, we accept H_0 and conclude that the error term follows a normal distribution.

4.2.7 Error Correction Estimates Using Vector Error Correction Model (VECM) Table 6:Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	18.78326	NA	0.024804	-0.861454	-0.632432	-0.785540
1	49.20172	49.43000*	0.003952*	-2.700108*	-2.425282*	-2.609011*
2	49.21503	0.020786	0.004215	-2.638439	-2.317809	-2.532159
3	50.00988	1.192279	0.004285	-2.625617	-2.259183	-2.504155
4	50.06070	0.073064	0.004568	-2.566294	-2.154056	-2.429649

Source: Author's Computation 2018

In order to carry out the vector autoregression estimation, the choice of lag length is vital. Thus, numerous lag length selection criteria were employed at 5% level to choose the appropriate lag length. For this study, the appropriate lag length is 1 as shown above in table 5.

Table 7: VAR Residual Serial Correlation LM Test

Lags	LM-Stat	Prob
1	1.602283	0.2056
2	0.723327	0.3951
3	1.077511	0.2993
4	0.125790	0.7228

Source: Author's Computation 2018

The LM test of residual serial correlation shows no autocorrelation among the successive residuals at any of the selected lags as shown in table 6. This is because all probability values are greater than the 5% level.

4.2.7.1 Vector Error Correction Estimates

$$\Delta LGDP=\beta_0+\sum_{i=1}^{n}(\beta_1\Delta LGDP_{t-i})+\sum_{i=1}^{n}(\beta_2\Delta LMS_{t-i})+\sum_{i=1}^{n}(\beta_3\Delta INTR_{t-i})+\sum_{i=1}^{n}(\beta_4\Delta LEXCR_{t-i})+\sum_{i=1}^{n}(\beta_5\Delta INFL_{t-i})+\varphi Z_{t-i}+\mu_t$$

Where

t-i = lag values of variables

φ= coefficient of the error correction term

Z = error correction term and is the OLS residual from the following long run co-integrating regression: LGDP = $\beta_0 + \beta_1$LMS + β_2LINTR + β_3LEXCR + β_4LINFL + μ_i

Table 8: Vector Error Correction Estimates

Cointegrating Eq:	CointEq1				
LGDP(-1)	1.000000				
LMS(-1)	0.491614				
LEXCR(-1)	0.699351				
INTR(-1)	-0.038915				
INFL(-1)	-0.031930				
C	2.979628				
Error Correction:	D(LGDP)	D(LMS)	D(LEXCR)	D(INTR)	D(INFL)
CointEq1	-0.106132	0.103795	0.262908	-0.092534	20.20962
D(LGDP(-1))	0.049599	0.633888	0.168240	-17.10862	-29.65517
D(LMS(-1))	0.235525	0.517573	-0.360912	-5.564384	49.26464
D(LEXCR(-1))	0.075098	-0.120806	0.123984	-0.028699	13.37851
D(INTR(-1))	-0.000120	-0.003176	-0.000382	0.436700	-0.940468
D(INFL(-1))	-7.62E-05	0.000324	0.003946	0.090737	0.274118
C	0.137686	-0.037077	0.046765	2.434029	-17.72586
R-squared	0.618431	0.458685	0.155146	0.423151	0.293885
Adj. R-squared	0.533638	0.338392	-0.032599	0.294962	0.136971
Sum sq. Resids	0.147407	0.214255	2.612657	351.8762	5526.018
S.E. equation	0.073889	0.089081	0.311071	3.610049	14.30620
F-statistic	7.293403	3.813084	0.826366	3.300997	1.872901

Log likelihood	44.25168	37.89419	-4.622030	-87.97153	-134.7886
Akaike AIC	-2.191275	-1.817305	0.683649	5.586561	8.340504
Schwarz SC	-1.877025	-1.503055	0.997900	5.900811	8.654755
Mean dependent	0.190718	0.212395	0.174456	0.194706	0.235268
S.D. dependent	0.108197	0.109518	0.306121	4.299389	15.39967

Determinant resid covariance (dof adj.)	0.003645
Determinant resid covariance	0.001151
Log likelihood	-126.1803
Akaike information criterion	9.775313
Schwarz criterion	11.57103

Source: Author's Compilation 2018

Estimated VECM with LGDP as the target Variable

$$\Delta LGDP=0.137686 + 0.235525\Delta LMS_{t-1} - 0.000120\Delta INTR_{t-1} + 0.075098\Delta LEXCR_{t-1} - 7.62E\text{-}05\Delta INFL_{t-1} - 0.106132Z_{t-1}+\mu_t$$

Co-integrating equation (long run model)

Z_{t-1} = 2.979628 + 0.491614LMS - 0.038915INTR + 0.699351LEXCR - 0.031930INFL

The 7 above contains the vector error coefficient estimates. The apriori expectation for the vector error correction coefficient is that it must be negative. The value of the vector error coefficient is -0.106132 and it conforms to the apriori expectation. This implies that 10.6132% of the errors are corrected in the long run. By being negative, it informs us that if there is a departure in one direction, the correction will have to be pulled back to the other direction in order to ensure equilibrium is returned. Thus, to interpret this is that above 10.6132% of departures in long-run, equilibrium is corrected each period.

4.2.8 Causality Test:

Here, the error correction model estimates is specified as follows in the system equation to find the p-values to determine the long-run causality as well as the short-run causality.

$D(LGDP) = C(1)*[LGDP_{t-1} + 0.491614*LMS_{t-1} - 0.038915*INTR_{t-1} + 0.699351 *LEXCR_{t-1} - 0.031930*INFL_{t-1} + 2.97962812357] +C(2)*D(LGDP_{t-1}) + C(3)*D(LMS_{t-1}) + C(4)*D(LEXCR_{t-1}) + C(5)*D(INTR_{t-1}) + C(6)*D(INFL_{t-1}) + C(7)$

N.B: co-integrating equation is given in [ ], c(1) is the long-term coefficient while c(2), c(3),..., c(6) are they short term coefficient.

Table 9: Vector Autorgression Estimates (VAR), lag length = 1

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.106132	0.043384	-3.446335	0.0012
C(2)	-0.049599	0.222814	-0.222604	0.8255
C(3)	0.235525	0.152812	1.541275	0.1349
C(4)	0.075098	0.046725	1.607218	0.1196
C(5)	0.000120	0.003825	0.031446	0.9751
C(6)	-7.62E-05	0.001122	-0.067955	0.9463
C(7)	0.137686	0.050975	2.701034	0.0118
R-squared	0.618431			
Adjusted R-squared	0.533638			
F-statistic	7.293403			
Prob(F-statistic)	0.000105			
Durbin-Watson stat	1.949720			

Source: Author's Compilation 2018

4.2.8.1: Interpretation of Results

Short-run Dynamics

The short run coefficient which is C(2) is the short run coefficient associated with the deepening lag values of the target variable. But the paper is mainly concerned with C(3), C(4), C(5) and C(6) because they are the short run coefficients that will let us know if in the short-run monetary policy granger causes gross domestic product. Therefore, we need to test these coefficients.

Hypothesis

H_0: C(3)=C(4)=C(5)=0 (monetary policy does not Granger Cause Gross Domestic Product).

H_1: C(3)=C(4)=C(5)≠0 (monetary policy does Granger Cause Gross Domestic Product).

The Granger Causality test follows the chi-square distribution with two degree of freedom (df) at 5% level of significance.

Decision rule:

Accept H_0, if $X^2_{cal} < X^2_{tab}$ (0.05) and reject, if otherwise.

$X^2_{cal} = 5.366696$

$X^2_{tab} = 9.49$

Thus, we accept H_0 and conclude that monetary policy does not Granger Cause Gross Domestic Product in the short-run since $X^2_{cal} < X^2_{tab}$.

Long-run Dynamics

The error correction model [C(1)] signifies the speed of adjustment towards long-run equilibrium. It has to be negative and statistically significant for it to fulfil its economic interpretation. As can be observed from table 8 above, it meets both conditions. It has a negative value of -0.106132 and statistically significant (0.0012< 0.05). By being negative, it informs us that if there is a departure in one direction, the correction will have to be pulled back to the other direction to ensure equilibrium is returned. Therefore, above 10.6132% of departures in long-run, equilibrium is corrected in each period.

In addition, since C(1) is statically significant, it means that our focus is on the causal relationship between monetary policy and economic growth (LGDP). We reject the null hypothesis which states that monetary policy does not granger cause Gross Domestic Product and Gross Domestic Product does not granger cause monetary policy if the probability value of long-run term adjustment is less than 0.05 to show causal relationship. Thus, since 0.0012< 0.05, we reject the null hypothesis and conclude that a bi-directional causal relationship exists between monetary policy and economic growth in Nigeria.

4.3 Discussion of Major Findings

From the empirical results carried out, it was discovered that monetary policies did not have a significant impact on Nigeria's economic growth in the short run, but significantly affected the country's growth in the long run. The non significance of the nation's monetary policies on economic growth in the short run is a strong proof of the gap between monetary policies formulation and implementation in Nigeria. This finding is supported by Eyiuche (2000) who opined that "an outstanding plan, meticulously and excellently formulated, without effective implementation is as good as unrealistic appreciation of horses without ridding". Excellent monetary policies on paper devoid of effective implementation will always yield results that are not significant on the economy. In addition, other factors that might cause the non-significance of monetary policies on Nigeria's economic growth in the short run include: underdeveloped nature of the country's financial market, volatility in crude oil prices, external debt overhang, fiscal dominance etc. This view is supported by Sanusi (2002), who opined that the achievement of monetary policy objectives has been affected by domestic and external environments which include fiscal dominance, underdeveloped nature of the financial markets, external debt overhang and volatility in oil price.

In the long run, monetary policies play a vital role in affecting the country's economic growth. This indicates the key role the Central Bank of Nigeria plays in the process of national development of the Nigerian economy. The function the Central Bank of Nigeria performs in managing the liquidity in the economy which influences some macroeconomic variables such as the output, prices and employment cannot be exaggerated. Over the years, the Central Bank of Nigeria has adopted different methods of monetary policy management to ensure the Nigerian economy is stable and vibrant.

5.0 Conclusion and Recommendations

The paper examines monetary policy influence on Nigeria's economic growth from 1980 -2016. The estimated econometric result illustrated that monetary policy does not significantly influence Nigeria's economic growth in the short run but significantly affected it in the long run. The co-integration test showed that a long run relationship exists between money supply, interest rate, exchange rate, inflation rate and gross domestic product in Nigeria. Based on these findings, the following recommendations were proffered: Firstly, the gap between the formulation and implementation of monetary policy should be bridged. Thus, the CBN should ensure that the implementation mechanism of monetary policy is efficient to spur economic growth in Nigeria. Secondly, monetary policies employed by the CBN should be used to create a favourable climate for investment by aiding the emergence of market-based interest rate and exchange rate that will attract both local and foreign investments, encourage non-oil exports, generate employment opportunities as well as revive industries that are presently functioning far below their installed capacity. Thirdly, the monetary authorities should ensure there is effective coordination of monetary and fiscal policies to stimulate economic growth in Nigeria. Finally, appropriate monetary authorities should try to make the financial sector more viable and less volatile as this will ensure the smooth implementation of the Central Bank of Nigeria's monetary policies

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