

## **Nexus on the Responsiveness of Nigeria Economy to Monetary Policy (1986-2018)**

**Henry Obukohwo<sup>1</sup>, OBEH and Umunna Godson, NWAGU<sup>2</sup>**

<sup>1</sup>Economics Unit, School of General Studies, Delta State Polytechnic, Otefe-Oghora, NIGERIA

<sup>2</sup>Department of Economics, University of Nigeria, Nsukka, NIGERIA.

### **Abstract**

*The study investigated the nexus on the responsiveness of Nigeria economy to monetary policy from 1986-2018. The study employed the Ordinary Least Square method for the estimation. The study tested for descriptive statistics, tested for unit root where real gross domestic product and exchange rate are integrated of I(2), money supply, monetary policy, inflation, liquidity ratio and external reserve are integrated of order I(1) and interest rate is integrated of order I(0). The study also used the Johansen co-integration test to confirm the long run relationship among the variables. The result of the study reveals that monetary policy has a positive impact on economic growth in Nigeria. The study concluded and recommended that there is need to reduce the excessive government expenditure in line with the objectives of monetary policy of the government. Again, monetary policy measures should be well co-ordinated so that the desired behavioural changes in the real sector will be achieved*

**Keywords:** ECM, monetary policy, money supply, Nigeria economy, RGDP.

### **1. Introduction**

Monetary policy is monetary management methods set up by the government through the central bank to control stock that is the supply of money to impact broad macro-economic objective which includes price stability, high level of employment, sustainable economic growth, and a balance of payment equilibrium. This wide objective is accomplished using proper instruments relying upon which objective the policy formulated wants to achieve and on the level of development of the economy. Since the expositions of the role of monetary policy in influencing objective like economic growth, price stability, promotion of employment, equilibrium in the balance of payments, and so forth, the monetary authority has put upon themselves the obligation of utilizing monetary policy to develop their economies (Adigwe, Echekeba & Onyeagba, 2015). The submissions of Folawewo and Osinubi (2006) considers monetary policy to be a mix of measures intended to control the value, supply, and cost of money in an economy, in consonance with the expected degree of economic activity.

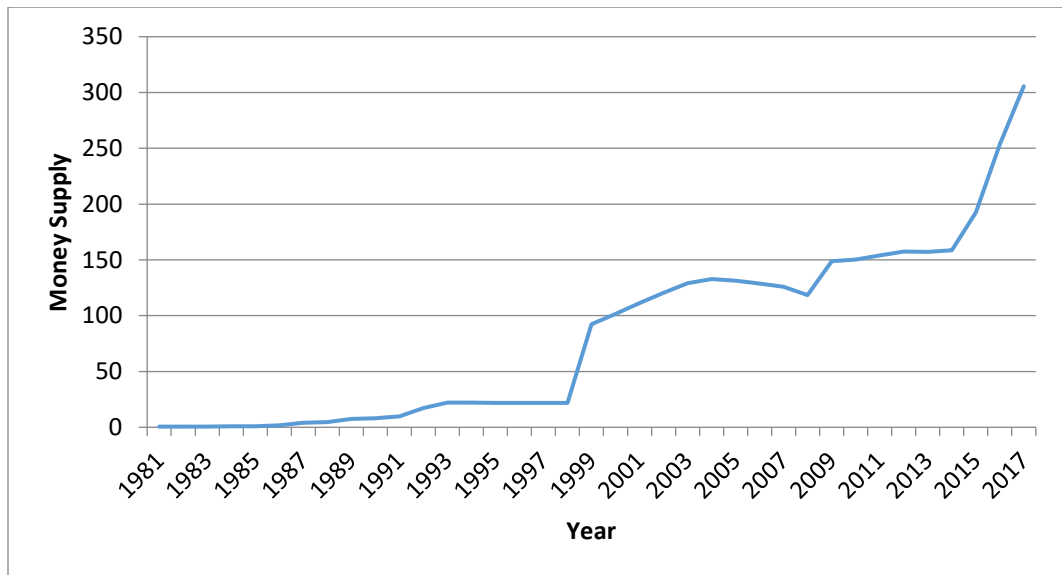
In Nigeria, monetary policy has been utilized since the Central Bank of Nigeria (CBN) was given the obligation of formulating and implementing monetary policies by the

Central Bank Act of 1958. This role has encouraged the rise of an active monetary market where treasury bills, a financial instrument utilized for open market operation and raising debt for the government has grown in volume and value turning into noticeable earning assets for speculators and source of balancing liquidity in the market (Adigwe, Echekoba & Onyeagba, 2015). As said before, these objectives of monetary policy incorporate the promotion of employment and output growth, and sustainable development. These objectives are vital for the achievement of internal and external balance and promotion. Additionally, monetary policy underpins growth relates to its impact on the cost and accessibility of credit. The cost of credit to investors and consumers could be influenced by Central Bank expanding or lessening the interest rate at which it lends to banks (MPR, monetary policy rate). On the off chance that the rate is diminished, it is expected that banks would likewise lessen their loaning rates so cash ends up less expensive for investment and consumption, which thus builds business action along these lines supporting economic growth and if the interest rate increases, it is expected that the money being used in the economy would appreciate compared with foreign currency (CBN, 2016). The Central Bank of Nigeria (CBN) revealed that the economy went into a more profound and widespread recession in 1983, 1984, and 1985 respectively. Gross domestic product cum capacity usage declined, the balance of payment position stayed basic with falling foreign exchange reserves, trade arrears accumulated worsened, inflation rates soared and unemployment increased (Osinubi, 2005). In 1985, when it appears that the prior policy measures were insufficient to handle Nigeria's macroeconomic issues, the government embraced in the second half of 1986 the Structural Adjustment Program (SAP), which has guided carefully by the International Monetary Fund (IMF)/World Bank. Even though SAP encapsulated the orthodox demand-side macroeconomic and supply-side policies, the domination of monetarism ended up self-evident. Monetary policies under the SAP, except in 1988, were generally prohibitive and intended to wipe up what was asserted as excess liquidity in the economy (Osinubi, 2005).

Monetary policy is formulated and implemented based on the volume and bearing of money supply and openness of financial resources in the economy. As indicated by Owosekun (2010) monetary policy is significant for getting to the direction and magnitude of effect in changes of money supply and credit on the following; production, employment, price stability, and economic growth and development. The Central Bank of Nigeria (CBN) controls the economy by influencing the activities and operation of deposit money banks (DBMs). The apex monetary authority likewise controls the commercial bank's reserves utilizing various monetary policy tools, for example, open market operations; cash reserve ratio, discount rate, stabilization securities, liquidity ratio, and qualitative instruments like moral suasion and selective credit control. (Ajie & Nenbee, 2010; Ike, 1989). Moreover, Ike (1989) is of the assessment that monetary policy is monetary management including the management of money supply in the economy and encompasses cash management, foreign exchange management, international liquidity, interest rate policy, the gamut of monetary policy instruments, the capital market, indirectly wage and salary management, etc.

The primary aim of monetary policy in 2013 was to sustain the already moderated rates of inflation which was achieved in the first half of 2013; the monetary policy was to achieve inflation of 8.0% at the end of December 2013 from 8.4% in June that same year. In 2014, the monetary policy focused on achieving the objective of price and exchange rate stability, inflation remained within single digits, and fluctuates between 7.7 to 8.5%, in the review period due to the combined effect of the declines in prices of clothing's, footwear, and transport. In 2015, 2016, and 2017, the Bank's monetary policy was shaped largely by continuing market expectations of the normalization of US monetary policy, weak global growth, and falling crude oil prices in the international market with its negative impact on foreign exchange reserves and exchange rates. In 2018, the monetary policy continued to be shaped by developments in the global and domestic economic and financial environment (CBN, 2018)

In ensuring price stability, exchange stability, and other macroeconomic objectives the Central Bank of Nigeria implements policies that guarantee sustained economic growth through appropriate changing levels of the money supply.



**Fig 1.1: Money Supply (M2), 1981-2017**

Sources: CBN 2018

From the above graph, it can be seen that the money supply increases every year. In 1981 the money supply was N14.47 billion, these increases in 1990 to N52.86 billion, in 1995 to 289.09 billion, in 2000 to N878.46 billion, in 2005 to N2, 637.91 billion, in 2010 to N11, 525.53 billion, in 2015 to 20,029.83 billion, in 2017 to N24, 140.63 billion. Currently, in Feb 2019, M2 was N34, 798. 93.

Monetary policy is a bundle of activities intended to deal with the growth of the money supply during a period to its optimal objective. It is significant regardless of the economic framework set up. It comprises discretionary measures designed by the monetary experts to control and influence the supply, cost, and direction of money and credit provided to the economy. The measures are attempted so that monetary expansion is kept at a pace steady with the level of economic activity and in consonance with general macroeconomic stability (Ojo, 1994). The achievement or disappointment of monetary policy can be gotten too based on its effect on economic growth just as on the domestic and external strength of the economy. One significant point of the policy is that of stabilizing the economy, that is, it ought to stimulate the economy in recession and dampen it in times of inflation (Osinubi, 2005).

There have been various regimes of monetary policy in Nigeria, sometimes monetary policy is tight and at times it is loose mostly used to stabilize prices. The economy has witnessed times of expansionary and contraction but evidently, the reported growth has not been a sustainable one as there is evidence of growing poverty among the populace (Onyeiwu, 2012). The failure of the monetary policy in curbing price instability has caused growth instability as Nigeria's record of growth and development has been very poor. An examination of the summary of the long-term pattern reveals that following secular swing: 1965-1968 rapid decline (civil war years), 1961-1971 Revival, 1971-1980 Booms, 1981- 84 crash, 1985-1991 renewed growth, 1992-2010 wobbling, (CBN, 2010). One of the major objectives of monetary policy in Nigeria is price stability. But despite the various monetary regimes adopted over the years, inflation remains a major challenge to Nigeria's economy. The Nigerian economic environment is encountering its terrible portion of wild value vacillations. Till today inflation keeps on being one of the most challenging of all the various economic problems faced by Nigeria. In the expressions of Kumapayi *et al* (2012) Nigeria's inflation problem is the connection to the oil blast of the 1970s and the rise in government consumption in the wake of the government's assurance to upgrade post-civil war reconstruction and development. The suggestion was an ascent in the domestic money supply without a corresponding increase in domestic production of goods and services. This contrarily influences funds mobilization and payment for investment, along these lines, antagonistically influencing output and employment (Itodo, Akadiri & Ekundayo, 2017). The persistent increase in the price levels will in general lead to an upward trend in inflation rates. Despite the different regimes that have existed in Nigeria, price instability still presents serious risks to drivers of economic growth. As far back as the 1970s, Nigeria has come with gross fluctuations in the inflation rate. The key challenge confronting the CBN is how to check price instability in the face of other macroeconomic problems.

Inflation in Nigeria has maintained a downward trend since February 2010: it stood at 15.6% in February 2010 but descended to a historical single digit of 9.4% and 9.3 in July and August 2011 respectively but bounced back to a double-digit of 12.6% and 11.9% in January and February in 2012 and in December 2012, inflation rise back to 12.0%. All through 2013 to 2015 inflation was seen to be in single digits until February 2016, inflation rise to double digits of about 11.38% and in December 2016, it further increases to 18.55%.

The increase of inflation to double digits has been so up to date of 11.37% in April 2019 and any double digits inflation is considered high and a problem.

To conclude, in Nigeria's situation, the economic recession which was triggered by the oil glut of the early 1980s also manifests symptoms of inflation, unemployment, and deficit disequilibrium (Ike, 1989). The Nigeria situation requires the sacrifice of some objectives of the state to attain the other objectives. To this end, several effort and programs have been put forward to ensure the stability of price and a viable exchange rate for the naira vis-a-vis other currencies of the world has not yielded the desire results as Nigerians are still facing price instability (high inflation) a continuous downward fall of Naira's competitiveness among currencies. This situation, therefore, constitutes the problems and thus raises fundamental questions. This study will now look at how the Nigerian economy responds to the monetary policy.

The paper is structured as follows: Section 2 review the related literature. Section 3 presents the methodology. Section 4 provides the results while section 5 presents the empirical findings and discussion of results. The last section is on the policy recommendations

## **2 Literature review**

### **2.1 Theoretical Literature**

According to Keynes, the rate of interest is determined by the equilibrium between demand for money and supply of money, that is, through money market equilibrium). The effect of money supply on the rate of interest and effect of rate of interest on aggregate demand provides a mechanism through which changes in the money supply affect the goods market which determines the level of economic activity in the economy, i.e., level of output and employment. Keynesians do not believe in the direct link between the supply of money and the price level that emerges from the classical quantity theory of money. They rejected the notion that the economy is always at or near the natural level of real GDP so that  $Y$  in the equation of exchange can be regarded as fixed. They refused the proposition that the velocity of circulation of money is constant and can cite evidence to support their case. Keynes's however, remain sceptical about the effectiveness of the monetary policy. They pointed out that expansionary monetary policy that increases the reserves of the banking system need not lead to a multiple expansion of the money supply because banks can simply refuse to lend out their excess reserves.

Nevertheless, to a greater extent, most monetarists do not advocate the use of discretionary monetary policy, namely, an expansionary or easy money policy, to lift the economy out of recession and tight monetary policy to check inflationary boom and thereby correct the "downs" and "up" of the business cycles. The chief monetarist called Friedman contends that, historically, far from stabilizing the economy, discretionary changes in money supply or rates of interest have a destabilizing effect on the economy. The monetarist also argue that in the short run, that expansionary monetary policy may increase the level of real GDP by increasing aggregate demand. The view of the classical monetary policy is base on the quantity theory of money. According to the classical, an increase or decrease in the quantity of money leads to a proportional increase or decrease

in the price level. The quantity theory of money is usually discussed in terms of the equation of exchange as stated below

$MV=PY$ . P represents the price level, and Y represents the level of current real GDP. However, PY represents the current nominal GDP. M represents the supply of money over which the Fed has some control; and V represents the velocity of circulation, which is the average number of times a dollar is spent on final goods and services over a year. The classical economists assume that Y in the equation is fixed, at least in the short run. And the velocity of money tends to remain constant so that V can also regard as fixed.

The neoclassical growth model considered two-factor production function with capital and labour as determinants of output and added the exogenously determined factor, technology, to the production function. Just like the fixed proportion function of the Harrod-Domer model of economic growth, the neoclassical growth model makes use of the variable proportion production function that considers unlimited possibilities of substitution between capital and labour in the production process. The basic improvement of endogenous growth theory over the previous models is that it explicitly tries to model technology (that is, looks into the determinants of technology) rather than assuming it to be exogenous. Mostly, economic growth comes from technological progress, which is essentially the ability of an economic organization to utilize its productive resources more effectively over time.

## ***2.2 Empirical Literature***

Dilshad, Mohammed, and Usman (2016) focused on the impact of monetary policy on economic growth in Pakistan spanning. The study adopted the autoregressive distribution lag (ARDL) Co-integration approach and findings reveal that long-run association occurs among variables, money supply, and exchange rate, which positively influence economic growth. Also Inflation positive and insignificant and interest rates negatively affect economic growth.

Aslam and Awan (2018) investigated the impact of monetary policy on Pakistan's economic growth. The result of the study shows that monetary policy has a significant effect on the inflation rate, money supply, employment, gross capital formation, foreign direct investment, savings, and other macroeconomic variables. Mutwiri (2017) examined the relationships between monetary policy tools and inflation in Kenya. The result of the study reveals that the 91 Treasury bill rates have an impact on the level of inflation. Ofori, Danquah, and Zhang (2017) studied the impact of money supply on inflation in Ghana. The results of the study reveal a long-run positive relationship between money supply and inflation. Eshun (2015) investigated the effect of monetary policy on the general prices in Ghana and other principal variables such as interest rate, exchange rate, and household consumption expenditure. From the result of the study, it was found that evidence of long-run co-integration relationship among the variables. The estimated model shows that monetary policy rate, exchange rate, money supply, output, and government expenditure were all significant in explaining inflation in the long run, but in the short run, only monetary policy influences inflation significantly.

Ajibola and Adeyemi (2018) studied the impact of monetary policy on economic growth in Nigeria. The result of the study shows that money supply and the exchange rate had a positive but fairly insignificant impact on economic growth while interest rate and liquidity ratio had a negative but highly significant impact on economic growth. Anowor and Okerie (2016) re-examined the impact of monetary policy on economic growth in Nigeria. The results as in consonance with the economic literature as monetary policy among other objectives are geared towards achieving the macroeconomic objective of sustained economic growth and price stability. Akinjare, Babajide, Isibor and Okafor (2016). The study investigated monetary policy and its effectiveness on economic development in Nigeria. The result of the study reveals that while exchange rate, interest rate, and money supply are significant in impacting the economy, inflation proves otherwise. Nasko (2016) examined monetary policy on economic growth. The variables used are found to have a marginal impact on the economic growth of Nigeria. Mordi, (2014) looked at the effects of monetary policies on the real economic growth of Nigeria (a different component of real output. The study found from the result of the impulse response functions that sectoral output responded heterogeneously following contractionary monetary policy shocks, with some responding negatively while others responded lagged negative. Nwoko, Ihemeje, and Anumadu (2016) studied the impact of CBN monetary policies on the economic growth of Nigeria. The result of the study reveals that CBN monetary policy measures are effective in regulating both monetary and real sector aggregates such as price level of output, employment, and the rate of economic growth. In a similar study with Adedamola (2015), Babatunde and Kehinde (2016) examined the impact of monetary policy on price stability in Nigeria. The result of the study found that exchange rate and money supply influenced price stability in Nigeria both in the short run and long run.

Sulaima (2015) examined the price stability effect of monetary policy. The result of the study shows that monetary policy implementation has not yielded the expected outcome to ensure price stability. The findings also reveal that the general price level increases as the exogenous variables increase. Ahmed and Murtala (2014) studied the impact of monetary policy on price stability in Nigeria. The study found that there a relationship between the explained variable (inflation) and the explanatory variables (money supply, interest rate, and liquidity ratio). A similar work by Idoko, Seyi, and Rotimi (2017), examined monetary policy on price stabilization level in Nigeria. The study reveals that money supply has no significant relationship with the price level in Nigeria. From the empirical findings, most researchers have investigated the impact of monetary policy on price stability, monetary policy on the exchange rate, monetary policy on unemployment, and monetary policy on economic growth. This study will look at how the Nigerian economy has responded to CBN monetary policy by the responses of price stability, exchange rate, and economic growth in general from 1980 to 2018.

### 3. Methodology

The theoretical framework will hinge on the endogenous growth theory of economic growth developed by Romer (1986) and Lucas (1988). The model assumes that the key determinants of economic growth are population growth and the accumulation of human capital and knowledge. In a knowledge-based economy, supported by robust intellectual property rights, there are no diminishing returns to capital accumulation which is as a result of positive spillover effects from investment in technology and people. The AK model, which is the simplest endogenous model, give a constant-savings rate of endogenous growth and assumes a constant, exogenous, saving rate It models technological progress with a single parameter (A). It uses the assumption that the production function does not exhibit diminishing returns to scale to lead to endogenous.

The AK model production function is a special case of a Cobb-Douglas production function:

$$Y = AK^\alpha L^{1-\alpha} \tag{3.1}$$

This equation shows a Cobb-Douglas function where Y denoted the total production in an economy. A represents total factor productivity, K is capital, L is labour, and the parameter  $\alpha$  measures the output elasticity of capital.

Ordinary least square (OLS) regression is a statistical method of analysis that estimates the relationship between one or more independent variables and a dependent variable: the method estimates the relationship by minimizing the sum of squares in the difference between the observed and predicted values of the dependent variable configured as a straight line. In this research work, OLS will be carried out in the context of a multivariate model in which there are two or more explanatory variables. The multiple regression model generally has the following form:

$$Y_t = \beta_1 X_{1t} + \beta_2 X_{2t} + \beta_3 X_{3t} + \dots + \beta_k X_{kt} + \mu_t \tag{3.2}$$

Where  $X_{1t}$  is a vector equal to unity (to allow for the constant term) and  $X_{it}$  ( $i=2,3,\dots,k$ ) is the set of explanatory variables or regressors.

#### 3.1 Model Specifications

The model of the paper is specified as follow:

$$RGDP = (MS, INF, EXR, INT, LR, MPR) \tag{3.3}$$

Where RGDP = Real gross domestic product, MS = Money Supply a proxy of Monetary policy.

INF = Inflation, EXR = Exchange rate, LR = Liquidity ratio, ER = External reserve, MPR = Monetary policy rate. The econometric version of equation 3.3 is stated thus:

$$RGDP_t = \beta_1 + \beta_2 MS_t + \beta_3 INT_t + \beta_4 EXR_t + \beta_5 ER_t + \beta_6 LR_t + \beta_7 MPR_t + \mu_t \tag{3.4}$$



### 3.2 Estimation Techniques and Procedure

#### 3.2.1 Stationarity/Unit Root Test

In time series analysis, there is every tendency for estimations to be estimated to be spurious which violates the reliability of the coefficient for policy prescription and formulation. This calls for carrying out a unit root test on various series and establishing their order of integration.

In order not to run a spurious regression, a time series data should be examined for stationarity. Using the Dickey-Fuller (ADF) Test, all variables were tested at levels. The test is based on the following model.

$$Y_t = \alpha y_{t-1} + ut \tag{3.5}$$

The null hypothesis is  $H_0: \delta = 0$  and the alternate is  $H_a: \delta < 0$ .

If the ADF test statistics is less than the critical value, we reject the null hypothesis and conclude the series is stationary (has no unit root).

#### 3.2.2 Cointegration Test

Once variables have been classified as integrated of order  $I(0)$ ,  $I(1)$ ,  $I(2)$ , etc. is possible to set up models that lead to stationary relations among the variables, and where standard inference is possible. The necessary criteria for stationarity among non-stationary variables are called cointegration. Testing for cointegration is a necessary step to check if your modeling empirically meaningful relationships. If variables have different trend processes, they cannot stay in fixed long-run relation to each other, implying that one cannot model the long-run, and there is no valid base on standard distribution. There are several tests for co-integration. The Johansen test is the most fundamental test. Engel and Granger (1987) formulated one of the first test of cointegration. This test has the advantage that it is intuitive and easy to perform. Johansen procedure will be used to test for co-integration among the variables; this verifies the existence of an underlying long-run stationary steady-state relationship between the dependent and explanatory variables. Thus, the co-integrated equation is stated below as

$$Z_t = AZ_{t-1} + A_2Z_{t-2} + AKZ_{t-1} + U_t \tag{3.6}$$

#### 3.2.3 Error Correction Model (ECM)

In the wake of testing for the co-integration relationship and it is demonstrated to exist between the variables, at that point the following stage will be to test for a error correction model (ECM) to display the elements of the relationship. The reason for the ECM is to decide the speed of change from the short-run disequilibrium to the long run equilibrium state.

If then,  $Y_t$  and  $X_t$  are co-integrated by definition  $ut \sim I(0)$ . Thus, we can express the relationship between  $Y_t$  and  $X_t$  with an ECM specification as

$$\Delta Y_t = a_0 + b_1 \Delta X_t - \Pi u_{t-1} + Y_t \tag{3.7}$$

#### 3.2.4 Reliability Test

Autocorrelation is the correlation between members of series of observations ordered in time series data or cross-sectional data. The classical linear regression model assumes that such autocorrelation does not exist in the disturbances  $U_t$ .

$$\text{cov}(u_i, u_j / x_i, x_j) = E(u_i, u_j) = 0 \tag{3.8}$$

However, if there is such dependence, we have autocorrelation.

$$E(u_i, u_j) \neq 0 \tag{3.9}$$

To test for the presence of serial correlation of the error terms in the model, The Bresuchpagan test were employed

### 3.3 Data Sources

Data for this study will be sourced from the Central Bank of Nigeria (CBN) 2018 and World Bank Indicator (WDI) 2018. The E-Views software 9 was used for analysing the data and estimating the specified models.

## 4 Data Presentation and Analysis of Results

### 4.1 Unit Root Results and Analysis

Table 4.1 show the unit root or stationarity result using the Augmented Dickey Fuller(ADF) unit root test and will carried by 5%.

**Table 4.1:** UNIT ROOT TEST RESULTS

Variables	Test Critical Value @ 5%	Level	1 <sup>st</sup> Diff.	2 <sup>nd</sup> Diff	Diff. Prob.	Order of Integration
RGDP	-3.568379	-1.762819	-2.576063	-4.612150*	0.0054	I(2)
MS	-3.562882	2.165920	-4.284426*		0.0103	I(1)
MPR	-3.568379	-2.344377	-5.917362*		0.0002	I(1)
LR	-3.568379	-3.312066	-6.048295*		0.0001	I(1)
INR	-3.562882	-4.026156*			0.0182	I(0)
INF	-3.595026	-2.578317	-3.688939*			I(1)
EXR	-3.574244	-1.635798	-3.502588	-7.828268*	0.0000	I(2)
ER	-3.574244	-1.932408	-4.778456*		0.0033	I(1)

Source: EVIEW 9

The null hypothesis (H<sub>0</sub>) is that there is a presence of the unit root meaning that the variables are not stationary while the alternative hypothesis (H<sub>a</sub>) is that there is no unit root, meaning that variables are stationary. Specification level is noted as \* no unit root presence. From the above table using the Augmented Dicky Fuller (ADF) to test for unit root, interest rate (RIR) is integrated of order zero I(0), real money supply (MS), monetary policy rate (MPR), inflation (INF), liquidity ratio (LR) and external reserve (ER) are integrated of order one I(1) while the real gross domestic product (RGDP) and Exchange rate (EXR) are integrated of I(2). As a result of these, we can proceed to test for co-integration of the variables.

### 4.2 Johansen Cointegration Test

A rejection of the null hypothesis means that there are more than *r* numbers of co-integrating relationships. On the other hand, the null hypothesis associating with the Max-

eigenvalue is rejected when the Max-eigenvalue statistic value exceeds the critical value at every level of r

**Table 4.2** COINTEGRATION TEST RESULTS

**Unrestricted Co-integration Rank Test (Trace)**

Hypothesized No.of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical level	Prob
<i>r</i> 0	0.933265	306.6716	159.5297	0.000
<i>r</i> 1	0.907150	225.4609	125.6154	0.000
<i>r</i> 2	0.846926	154.1578	95.75366	0.000
<i>r</i> 3	0.768715	97.85270	69.81889	0.001
<i>r</i> 4	0.636334	53.92951	47.85613	0.0121
<i>r</i> 5	0.397505	23.58394	29.79707	0.2186
<i>r</i> 6	0.227971	8.383651	15.49471	0.4253
<i>r</i> 7	0.020508	0.621641	3.841466	0.4304

Source: EVIEW 9

Trace test indicates eight (5) cointegration equations at 5% level. This is evidence from the result presented above, which shows that up to 5, the trace statistic values are less than 5% critical value. Thus, to further confirm this result, the maximum eigenvalue statistic result is presented.

**Table 4.3:** UNRESTRICTED CO-INTEGRATION RANK TEST (MAXIMUM EIGENVALUE)

Hypothesized No.of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical level	Prob
<i>r</i> 0	0.933265	81/21071	52.36261	0.0000
<i>r</i> 1	0.907150	71.30310	46.23142	0.0000
<i>r</i> 2	0.846926	56.30506	40.07757	0.0003
<i>r</i> 3	0.768715	43.92320	33.87687	0.0023
<i>r</i> 4	0.636334	30.34556	27.58343	0.0215
<i>r</i> 5	0.397505	15.20029	21.13162	0.2751
<i>r</i> 6	0.227971	7.762010	14.26460	0.4034
<i>r</i> 7	0.020508	0.621641	3.841466	0.4304

Source: EVIEW 9

The max-eigenvalue test also indicates 5 co-integrating equation at the 5% significance level. The normalized co-integrating coefficients indicated further that the five co-integrating variable is gross domestic product, money supply, monetary policy rate, interest rate, inflation and liquidity ratio. Therefore, this shows that there will be long run relationship among the variables.

**Table 4.4** REGRESSION RESULT  
**Dependent Variable: RGDP**

Variable	Coefficient	Std. Error	t-Statistic	Prob
C	30.25660	3.883058	7.791953	0.0000
MS	1.047035	0.272713	3.839335	0.0008
INF	-4.452879	5.706187	-0.780360	0.4431
INT	7.239274	9.257239	0.782005	0.4422
EXR	6.306882	1.793871	3.515795	0.0019
LR	-16.18044	7.645734	-2.116270	0.0454
MPR	80.23270	27.02476	2.968859	0.0069
RESID(-1)	0.707090	0.213196	3.316622	0.0030
Adjusted R <sup>2</sup>	0.970871			
Durbin-Watson	1.623469			

Source: EVIEW 9

From the above regression analysis, it can be seen that money supply, exchange rate, and monetary policy rate are positive and statistically significant and liquidity ratio is negative and statistically significant while inflation and interest rate are statistically insignificant. Therefore one percent change in money supply will bring about a 1.04% increase in real gross domestic product, one percent change in the exchange rate will bring about a 6.3% increase in real gross domestic product, one percent change in the monetary policy rate will bring 80% increase in gross domestic product and a percentage change in liquidity ratio will bring about 16% decrease in the real gross domestic product in Nigeria. After testing for the Error Correction model, it was found to be significant. The R-Square also has a 97% goodness of fit of all variables. The Durbin-Watson statistic shows 1.623469, which indicates that there is no autocorrelation or serial correlation in the results.

## 5 Findings and Discussion

The study made some interesting findings. The study tested for unit root test to confirm the stationarity and order of integration of each of the variables, it also tested for the co-integration test with the use of Johansen co-integration to confirm the long-run relationship among the variables.

In the model money supply, exchange rate, and monetary policy rate are positive and statistically significant and liquidity ratio is negative and statistically significant while inflation and interest rate are statistically insignificant. Therefore one percent change in money supply will bring about a 1.04% increase in real gross domestic product, one percent change in the exchange rate will bring about a 6.3% increase in real gross domestic product, one percent change in the monetary policy rate will bring 80% increase in gross domestic product and a percentage change in liquidity ratio will bring about 16% decrease in the real gross domestic product in Nigeria. After testing for the Error Correction model, it was found to be significant. The R-Square also has a 97% goodness of fit of all variables. The Durbin-Watson statistic shows 1.623469, which indicate that there is no

autocorrelation or serial correlation in the result. The result shows that monetary policy has a positive impact on the economic growth of Nigeria.

## 6 Policy Recommendations

Base on the findings of the study, the study recommends the following: (a) Money supplied to the economy should be maintained at the level that will keep driving the economy to development level. (b) The study recommends that low interest rate should be charge on loan to investors (both small and medium scale business enterprises) which will boost SMEs and lead to job creation, reduction in crime and drive the economy to growth and development. (c) There is need to reduce the excessive expenditure of the government and bring into line the objectives of fiscal and monetary policy of the government. (d) Monetary policies should be used to generate a favourable investment climate by facilitating the emergency of market based interest rate and exchange rate regimes that attract both domestic and foreign investment and create employment.(e) The government is further recommends to deepen the level of finance in the economy which will go a long way to encourage investment through effective provision of credit facilities needed for maximum performance of the real sector of the economy. (f) Monetary policy measures should be coordinated well so that the desired behavioural changes in the real sector will be achieved.

## References

- Abubakar, D. (2012). Montary policy and price stability in Nigeria. An unpublished thesis of Ahmadu Bello University, Zaria.
- Adesoye, A.B. (2012) Price, money and output in Nigeria: A Co integration-causality analysis. *African Journal of Scientific Research*, 8 (1), 427-442.
- Adigwe, P. K., Echekoba, F. N., & Onyeagba, J.B.C. (2015). Monetary policy and economic growth in Nigeria: A critical evaluation. *IOSR Journal of Business and Management (IOSR-JBM)*, 17(2), 110-119.
- Agu, U., & Evoh, C. J. (2011). Macroeconomic policy for full productive and decent employment for all: The case of Nigeria. Employment Sector. Employment Working Paper No 107.
- Ahiabor, G. (2013) The effect of monetary policy on inflation in Ghana. *Developing Country Studies*, 3(12), 82-90
- Ahmed, H. U., & Murtala, G. (2014). Monetary policy and price stability in Nigeria. *Nigerian Journal of Management Technology and Development*, 5(4), 80-88.
- Ajie, H.A. & Nenbee, S.G. (2010). Monetary policy and stock prices in Nigeria (1980-2008): An econometric analysis, *The International Journal Series on Topical Issues*, 11 (2), pp. 183-194
- Akinjare, V., Babajide, A. A., Akhanolu, I. A., and Okafor, T. (2016). Monetray policy and its effectiveness on economic development in Nigeria. *International Business Management*, 10(22), 5334-5340.
- Amassoma, O., Ditimi, N., Nwosa, P. & Olaiya, S. (2011). "An appraisal of monetary policy and its effect on macroeconomic stabilization in Nigeria." *Journal Trends in Economics and Management science (JETEMS)*, 2 (3), 233-237.
- Alam, T. & M. Waheed (2006), "Sectoral effects of monetary policy: Evidence from Pakistan" Pakistan Institute of Development Economics, Islamabad.

- Anowor, O. F., & Okorei, G. C. (2016). A reassessment of the impact of monetary policy on economic growth: Study of Nigeria. *International Journal of Developing and Emerging Economies*, 4(1), 82-90.
- Aslam, M., & Awan, A. G. (2018). Impact of monetary policy on economic growth: Evidence from Pakistan. *Global Journal of Management, Social Sciences and Humanities*, 4(1), 89-109.
- Bakare, F. (2011). "An empirical study of the determinant of money supply growth and its effects in inflation rate in Nigeria." *Journal of Research in International Business and Management*, 1(5), 124-129.#
- Balami, B. H., Ahmed, F. F., Yusuf, A. B. (2016). Impact of monetary policy on inflation, exchange rate and economic growth in Nigeria. *HARD International Journal of Economics and Business Management*, 2(5), 67-82.
- CBN (2006). Central Bank of Nigeria (CBN), *Monetary Policy Department Series 1*, 2006.CBN/MPD/Series/01/2008.
- CBN (2014). The Conduct of Monetary Policy.
- CBN (2016). Monetary Policy. Central Bank of Nigeria Research Development.
- Central Bank of Nigeria (2018). The Conduct of Monetary Policy in Nigeria
- Chaudhry S. I, Yasmeen Q. Fatima F.(2012) Monetary policy, inflation and economic growth in Pakistan: Exploring the co-integration and causality relationships *Pak. J. Commer. Soc. Sci.* 6 (2), 332-347
- Chimobi, O.P. & Uche, U.C(2010). Money, price and output: A causality test for Nigeria. *American Journal of Scientific Research*, 8: 78-87.
- Dilshad, A., Mohammad, A., & Usman, G. (2016). Impact of monetary policy and economic growth: Empirical evidence of Pakistan. *International Journal of Applied Economic Studies*, 4(6), 1-9.
- Echekoba, A. P.K., & Onyeagba, J.B.C.(2015). Monetary policy and economic growth in Nigeria: A critical evaluation. *IOSR Journal of Business and Management*, 17(2), 110-119.
- Eshun, F. (2015). The effect of monetary policy on general price level in Ghana. Work submitted to the Department of Economics, University of Cape Coast.
- Fasanya, I. O., Onakoya, A. B.O., & Agboluaje, M. A. (2013). Does monetary policy influence economic growth in Nigeria? *Asian Economic and Financial Review*, 3(5): 635-646.
- Folawewo, A O., & Osinubi, T.S. (2006). Monetary policy and macroeconomic instability in Nigeria: A rational expectation approach. *Journal of Social Sciences*, 12(2): 93-100.
- Gupta, A. (2008). "Comparing bank lending channel in India and Pakistan.<http://papers>.
- Idoko, A. I., Seyi, S. A., & Rotimi, M. E. (2017). Monetary policy and price stability in Nigeria, *Academic Journal of Economic Studies*, 3(2), 68-75.
- Ike, D. N. (1989). Problems of monetary management in Nigeria with particular reference to monetary policy and foreign exchange management. *The Indian Journal of Economics*, 69(275).
- Itodo, A. I., Akadiri, S.S., Ekundayo, R. M. (2017). Monetary policy and price stability in Nigeria, *Academic Journal of Economics Studies*, 3(2), 68-75.
- Kumapayi, A. A., Nana, J. U., & Ohwofasa, B. O. (2012). Impact of inflation on monetary policy and economic development in Nigerian: Evidence from empirical data. *Asian Journal of Empirical Research*, 2(2), 28-39
- Lawson, J. & Rees, D (2008), "A sectoral model of the Australian economy. Reserve Bank of Australia, *Research Discussion Paper 2008-01*.
- Llaudes, R. (2007), "Monetary policy shocks in a two-sector open economy: An Empirical study". *ECB Working Paper No441*.
- Mishkin, F. S. (2007). Housing and the monetary transmission mechanism. NBER Working Paper No 13518

- Mordi, C. N. O. (2014). Effects of monetary policy on the real economy of Nigeria: A disaggregated analysis. CBN Research Department Publication
- Mutwiri, N. M. (2017). Monetary policy tools and inflation in Kenya. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 7(1):86-97.
- Nasko, A. M. (2016). Monetary policy on the economy of Nigeria. *Pyrex Journal of Business and Finance Management Research*, 2(10): 163-179.
- Nwoko, N. M., Ihemaje, J.C., & Anumade, E. (2016). The impact of monetary policy on the economic growth of Nigeria. *An International Multi-disciplinary Journal, Ethiopia*, 10(3): 192-206.
- Ofori, C. F., Danquah, B. A., & Zhang, X. G. (2017). The impact of money supply on inflation, A case of Ghana. *Imperial Journal of Interdisciplinary Research (IJIR)*, 3(1), 2312-231
- Omotor, D.G. (2011). The Nigerian economy and monetary policy: Some simple empirics. MPRA Paper No. 22672.
- Onayemi, S. O. (2013) Price stability effect of monetary policy and output growth in Nigeria: A Time Series Analysis. *Journal of African Macroeconomic Review*, 4 (1), 1-18.
- Onyeiwu, C. (2012). Monetary policy and economic growth. *Journal of Economic and Sustainable Development*, 3(7), 62-70.
- Orji, C. G. (2006). The effect of monetary policy on price stability in Nigeria. A research project Submitted to the Department of Economics, Faculty of Social sciences, Nnamdi Azikiwe University, Awka, Nigeria.
- Osinubim T. S. (2005). Lags in the effect of monetary policy in Nigeria. *Pakistan Economic and Social Review*, 43(1), 39-57.
- Raddatz, C. & Rigobon, R (2003), "Monetary policy and sectoral shocks: Did the Fed react properly to the high-tech crisis?" *Policy Research Working Paper 3160, The World Bank*.
- Rafiq, M.S. & Mallick, S.K.(2008). The effect of monetary policy on output in Kenya: A sign restriction approach. *Journal of Macroeconomics* 30: 1756-1791.
- Sulaiman, L.A. (2015). An empirical analysis of price stability effect of Nigerian monetary policy. International Conference on African Development Issues (CU-ICADI)2015: Social and Economic Models for Development Track.
- Ullah, H.S. (2013). Does monetary policy influence economic growth in Pakistan. University of Gujrat, Gujrat.
- Umoru, D. (2013). Monetary models and exchange rate determination: The Nigeria evidence. *International Journal of Development and Management Review (INJODEMAR)*, 8(1), 172-197.

### Biographical Note

**Henry Obukohwo, OBEH** is a Lecturer in the Economics Unit, School of General Studies, Delta State Polytechnic, Otefe-Oghora, NIGERIA. Email: [obehobus@gmail.com](mailto:obehobus@gmail.com) +2348038351314

**Umunna Godson, NWAGU** is a Lecturer in the Department of Economics, University of Nigeria, Nsukka, NIGERIA. Email: [umunnagodson@gmail.com](mailto:umunnagodson@gmail.com)+2347030401230