

## **Impact of Monetary Policy on Economic Growth: Empirical Evidence of Nigeria**

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**Abstract:** *The study investigated the impact of monetary policy on economic growth in Nigeria: Annual time series data were obtained from the Central Bank of Nigeria Statistical Bulletin for the period 1981 to 2017 on the variables used for the study. Unit root test was conducted using Augmented Dickey-Fuller test technique and the result showed that the variables were stationary though at different levels. Co-integration test was also conducted using Johanssen co-integration test method and the result showed that the variables in the model were co-integrated meaning that the variables have a long run relationship. The regression result showed that money supply, liquidity ratio and external reserve have a positive and significant impact on the economic growth in Nigeria The R-squared value showed that about 99 % of the total variations in the dependent variable were explained by changes in the explanatory variables The error correction result showed that the speed of adjustment to long run equilibrium is 56.79 percent when any past deviation must be corrected in the present period. Based on the findings it was recommended that that the central bank should adopt appropriate monetary policy by ensuring that optimum level of money supply and liquidity ratio that will effectively and efficiently stimulate economic activities are maintained in the economy and equally ensure that our external reserves are effectively managed,*

**Keywords:** *money supply, Liquidity ratio, external reserves, economic growth.*

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### **I. Introduction**

**1.1 Introduction:** The government through the Central Bank of Nigeria tries to control the supply of money and credit in the economy in order to check inflationary and deflationary pressures within the economic system. Monetary policy involves the management of the expansion and contractions of the quantity of money in circulation for specific purpose of achieving certain national objectives. In other words, monetary policy refers to any conscious action undertaken by the monetary authorities to change the volume, quantity, availability, cost and direction of money and credit in a given economy. It involves the credit control measures adopted by the Central Bank to control the supply of money as an instrument for achieving the objectives of general economic policy. (Chinweoke, 2005). It is also seen as a control measure which the central bank of the country adopts in controlling money supply, credits and cost of credits so as to achieve the objectives of general economic policy (Njoku, 2009). The principal objectives of monetary policy include: price stability, economic growth and balance of payments equilibrium (Jhingan, 2000). According to Njoku (2009) the objectives of monetary policy include: checking inflation and maintenance of price stability, productiveness and economic growth, maintenance of balance of payments equilibrium, equitable distribution of income, control of banks in credit creation activity. Anyanwu (1993) sees the objectives of monetary policy to include: maintenance of relative price stability in domestic prices, attainment of a high rate of, or full employment, achievement of a high rapid and sustainable economic growth, maintenance of balance of payments equilibrium and exchange rate stability.

### **1.2 Statement of problem:**

Nigeria has adopted and applied different types of monetary policies. Sometimes, tight monetary policy has been adopted and at other times loose monetary policy has been adopted to achieve a high rapid and sustainable economic growth among other objectives. Unfortunately, irrespective of these different forms of monetary policies adopted and applied, a high rapid and sustainable economic growth has not been achieved in Nigeria. Given that one of the important objectives of monetary is to achieve a high rapid and sustainable economic growth, the study therefore investigated the impact of monetary policy on economic growth in Nigeria.

### **1.3 Objectives of the study:**

The broad objective of the study was to investigate the impact of monetary policy on economic growth in Nigeria.

The specific objectives of the study were:

- (i) To investigate impact of money supply on economic growth in Nigeria
- (ii) To examine the impact of liquidity ratio on economic growth in Nigeria
- (iii) To investigate the impact of external reserves on economic growth in Nigeria

### **1.4 Hypothesis of the Study:**

In order to guide the study, the following null hypotheses were formulated:

- HO<sub>1</sub>: Money supply does not have any significant impact on economic growth in Nigeria.  
HO<sub>2</sub>: Liquidity ratio does not have any significant impact on economic growth in Nigeria.  
HO<sub>3</sub>: External reserves do not have any significant impact on economic growth in Nigeria

## **II. Literature Review**

### **2.1 Theoretical Framework**

**2.1.1 Classical view of monetary policy** In the classical theory, money is neutral in its effects on the economy. It plays no role in the determination of employment, income and output. Rather they are determined by labour, capital stock, state of technology, availability of natural resources, saving habits of the people, and so on. In the classical system, the main function of money is to act as a medium of exchange. It is to determine the general level of prices at which goods and services will be exchanged. The relationship between money and price level is explained in terms of the quantity theory of money. The classical quantity theory of money states that the price level is a function of the supply of money. Algebraically,  $MV = PT$  where M, V, P and T are the supply of money, velocity of money, price level and the volume of transactions. From the equation, the total money supply (MV) equals total value of outputs (PT) in the economy. Assuming V (the velocity of money) and T (the total output) to be constant, a change in the supply of money (M) causes a proportional change in the price level. Thus money is neutral. It is simply a 'veil' whose main function is to determine the general price level at which goods and services will be exchanged (Jhinghan, 2010).

**2.1.2 Keynesian view of Monetary Policy.** The Keynesian theory assigns a key role to money. It contends that a change in the money supply can permanently change such real variables as the interest rate, the levels of employment, output and income. Keynes believed in the existence of unemployment equilibrium in the economy. The existence of unemployment equilibrium implies that an increase in money supply can bring about permanent increase in the level of output. The ultimate influence of the money supply on price level depends upon its influence on aggregate demand and the elasticity of supply of aggregate output. The Keynesian chain of causation between changes in the quantity of money and in prices is an indirect one through the rate of interest. So when the quantity of money is increased its first impact is on the rate of interest which tends to fall. Given the marginal efficiency of capital, fall in the rate of interest will increase the volume of investment. The increased in investment will raise effective demand through the multiplier effect thereby increasing income, output and employment (Jhinghan, 2010).

### **2.1.3 The Monetarist Theory**

The monetarist essentially adopted Fisher's equation of exchange to illustrate their theory as a theory of demand for money and not a theory of output, price and money income by making a functional relationship between the quantities of real balances demanded a limited number of variables. Monetarist like Friedman emphasized money supply as the key factor affecting the wellbeing of the economy. Thus in order to promote steady growth rate, the money supply should grow at a fixed rate, instead of being regulated by the monetary authorities. Friedman equally argued that since money supply is substitutive not just for bonds but also for many goods and services, changes in money supply will therefore have both direct and indirect effect on spending and investment respectively such that demand for money will depend upon the relative rates of return available or different competing assets in which wealth can be (Udude, 2014).

### **2.2 Conceptual literature**

Monetary policy is concerned with money, with credit and banks, and how these features of the economy affect its tendency towards inflation or recession (Gill, 1978). Hardwick, Klean and Langmead (1994) defined monetary policy as a government's decision to control the money supply and/or influence interest rate and exchange rate. Barkley (1977) sees monetary policy as the conscious policy of government and/ or banking authorities to alter the supply of money, the availability of loanable funds or interest.. Moomaw and Olson (2007) defined monetary policy as the use of money supply to achieve full employment and other economic

goals. Chinweoke (2005) defined monetary policy as any conscious action undertaken by the monetary authorities to change the volume, quantity availability, cost and direction of money and credit in a given economy Anyanwu (1993) sees monetary policy as a deliberate effort by the monetary authorities (the central bank) to control the money supply and credit conditions for the purpose of achieving certain broad economic objectives. It is also seen as the process by which the government, central bank or monetary authority of a country control the supply of money, availability of money and cost of money to attain a set of objectives oriented towards the growth and stability of the economy (Dimoji, Atorudibo and Onwuneme, 2015). Ahuja (2011) is of the opinion that monetary policy is concerned with the measures taken to regulate the supply of money, the cost and availability of credit in the economy. Jhingan (2009) also sees monetary policy as the credit control measures adopted by the central bank of a country.

The principal objectives of monetary policy are: job creation and full employment; checking inflation and maintenance of price stability; productiveness, economic growth and development; maintenance of balance of payments equilibrium; equal distribution of income and control of banks in their credit creation activity (Njoku, 2009). According to Anyanwu (1993), the general objectives of monetary policy include: maintenance of relative stability in domestic prices; attainment of a high rate of, or full employment; achievement of a high, rapid and sustainable economic growth; maintenance of balance of payments equilibrium and exchange rate stability. Jhingan (2009) and Chinweoke (2005) are also of the opinion that the objectives of monetary policy include: full employment, price stability, economic growth and balance of payments.

To achieve these objectives, certain instruments are used by the apex bank. These instruments include bank rate, open market operation, legal reserve ratio, special deposits, directives (moral suasion) and funding (Chinweoke, 2005). According to Okafor and Obasi (2011), instruments of monetary policy include open market operation, required reserve ratio, bank rate, liquidity ratio, selected credit control and moral

There are two types of monetary policy. They are expansionary and contractionary or restrictive monetary policy. Expansionary monetary policy is used to overcome a recession or a depression or a deflationary gap in the economy. It is a system of increasing the volume of money in circulation to stimulate economic activity in the economy. When there is a fall in consumer's demand for goods and services and in business demand for investment goods, a deflationary gap emerges. The central bank starts an expansionary monetary policy that eases the credit market conditions and leads to an upward shift in aggregate demand. This is achieved by lowering reserve requirements, buying of securities in the open market as well as reducing bank rate including some selective controls. Restrictive monetary policy refers to a monetary policy designed to curtail aggregate demand or to overcome an inflationary gap. The economy experiences inflationary pressures due to rising consumer's demand for goods and services and there is also a boom in business investment. The central bank starts a restrictive monetary policy in order to reduce aggregate consumption and investment by increasing reserve requirement, cost of credit as well as embarks on the sale of its securities in the open market operations including some selective controls (Okafor and Obasi, 2011).

## **2.2 Empirical literature**

Onyeiwu (2012) examined the impact of monetary policy on the Nigerian economy. The study used ordinary least squares (OLS) method to analyse data between 1981 and 2008. The analysis of the data showed that monetary policy presented by money supply exerts a positive impact on GDP growth and Balance of Payments but negative impact on rate of inflation. The study recommended that monetary policy should facilitate a favourable investment climate through appropriate interest rates, exchange rate and liquidity management mechanism and the money market should provide more financial instruments that satisfy the requirement of the ever growing sophistication of operators.

Ismal, Adegbelemi and Mariam (2013) examined the impact of monetary policy on economic growth in Nigeria. The study used time-series data covering the range of 1975 to 2010. The effects of stochastic shocks of each of the endogenous variables were explored using Error Correction Model (ECM). The study showed that long run relationship exists among the variables. Also, the core finding of this study showed that inflation rate, exchange rate and external reserve are significant monetary policy instruments that drive growth in Nigeria. The study therefore recommended that the establishment of primary and secondary government bond markets that can also increase the efficiency of monetary policy and reduce the government's need to rely on the central bank for direct financing.

Nwoko, IHEMEJE and ANUMADU (2016) examined the extent to which the Central Bank of Nigeria Monetary Policies could effectively be used to promote economic growth, covering the period of 1990-2011. The influence of money supply, average price, interest rate and labour force were tested on Gross Domestic Product using the multiple regression models as the main statistical tool of analysis. The findings from the study revealed that average price and labour force have significant influence on Gross Domestic Product while money supply was not significant. Interest rate was negative and statistically significant. The study therefore

recommended that Central Bank Monetary Policy could be an effective tool to encourage investment, reduce unemployment, reduce lending rate and stabilize the economy of Nigeria.

Inam and Ime (2017) investigated the impact of monetary policy on the economic growth of Nigeria using annual data covering the period of 1970 to 2012. The study specifically seeks to: analyse the relationship between money supply and economic growth in Nigeria; determine the nature and direction of causality between money supply and economic growth. The study employed the Ordinary Least Square (OLS) techniques and the granger causality test. The result indicates a positive and insignificant relationship between money supply and economic growth. Furthermore, it indicated no causality between money supply and economic growth. The study recommended that government and relevant monetary authorities should ensure that money supply levels are effectively and efficiently monitored, managed and controlled so as to enhance, promote and achieve economic growth in Nigeria.

Dishad, Mohammad and Usman (2016) focused to explore, importance of monetary measures in promoting economic growth of Pakistan. The study obtained annual time-series data covering the range of 1973 to 2014, employing Augmented Dickey-Fuller (ADF) unit root test to measure stationarity of variables. Gross domestic product, Money supply, Inflation and Interest rate are stationary at level while exchange rate measured stationary at first difference. Autoregressive Distribution Lag (ARDL) Cointegration approach applied to distinguish the robust among the variables with specification of short-run and long-run. Empirical findings mentioned long-run association occurs among variables, money supply and exchange rate, which positively influence economic growth. Inflation positively while insignificance and interest rate negatively affect economic growth. The study suggested a stable exchange rate policy be ensured to enhance, economic growth of the country and should be used monetary policy to generate an agreeable venture atmosphere which attracts both internal and external investors thereby to stimulate economic growth. Economic growth possible to attain through promoting effective monetary policy measures necessary to control over the inflation and favorable interest rate.

Chipote and Makhetha-kosi (2014) explored the role played by monetary policy in promoting economic growth in the South African economy over the period 2000-2010. The study employed the Augmented Dickey-Fuller and Phillips Perron unit root tests to test for stationarity in the time series. The Johansen co-integration and the Error Correction Mechanism were employed to identify the long-run and short-run dynamics among the variables. The study showed that a long run relationship exists among the variables. Also, the core finding of this study showed that money supply, repo rate and exchange rate are insignificant monetary policy instruments that drive growth in South Africa whilst inflation is significant. The study therefore recommended that monetary policies should be used to create a favourable investment climate that attracts both domestic and foreign investments thereby promoting a sustainable economic growth. The government should also increase government spending on the productive sectors of the economy so as to promote economic growth as monetary policy alone is unable to effectively spur economic growth.

### **III. Methodology**

Multiple regression analysis was used in the study. Time series data spanning from 1981 to 2017 was sourced from the Central Bank of Nigeria statistical bulletin. The data was analysed using E-views.

#### **3.1 Model specification**

The functional form of the model is as follows:

$$GDP = f( MS, LR, EXTR) \dots\dots\dots (1)$$

The econometric specification is as follows:

$$GDP = b_0 + b_1MS + b_2LR + b_3EXTR + U \dots\dots\dots (2)$$

Where: GDP = Gross Domestic Product

MS= money supply

LR = liquidity ratio

EXTR = external reserves

U = stochastic variable or error term

b<sub>0</sub> = constant term

b<sub>1</sub>, b<sub>2</sub>, and b<sub>3</sub>= parameters to be estimated

#### **3.2 Apriori Expectation**

b<sub>1</sub> > 0, b<sub>2</sub> > 0, b<sub>3</sub> > 0,

Since the data for the analysis is time series, the Augmented-Dickey Fuller (ADF) unit root test was employed to ensure data stationarity and avoid the problem of spurious regression. The Johansen test for co-integration was also employed to investigate whether there is existence of long run relationship among the variables in the model.

**Table 1:** Unit root test result

Variables	ADF test statistic	5% critical value	Order of integration
GDP	-2.159239	-1.952473	1(0)
MS	-3.839292	-2.971853	1(0)
LR	-3.691158	-2.945842	1(0)
EXTR	-5.754187	-2.954021	1(1)

Source: Author's computation

The unit root test result presented on table 1 showed that GDP, MS and LR are all stationary at levels. This is because their various ADF test statistic are greater than their various 5% critical values in absolute terms. The result also showed that EXTR is stationary at first difference because its ADF test statistic is greater than its 5% critical value in absolute terms

**Table 2:** Johanssen co-integration test result

Sample (adjusted): 1983 2017  
 Included observations: 35 after adjustments  
 Trend assumption: Linear deterministic trend  
 Series: GDP MS LR EXTR  
 Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.901424	122.0941	47.85613	0.0000
At most 1 *	0.486099	41.00162	29.79707	0.0017
At most 2 *	0.336133	17.70126	15.49471	0.0229
At most 3	0.091605	3.362674	3.841466	0.0667

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.901424	81.09247	27.58434	0.0000
At most				
1 *	0.486099	23.30035	21.13162	0.0244
At most 2 *	0.336133	14.33859	14.26460	0.0487
At most 3	0.091605	3.362674	3.841466	0.0667

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level  
 \* denotes rejection of the hypothesis at the 0.05 level  
 \*\*MacKinnon-Haug-Michelis (1999) p-values

The trace test indicates that there were 3 co-integrating equations at 0.05 level while Mac-eigenvalue test also indicate that there were 3 co-integrating equations at 0.05 level/ All these results showed that the variables are co-integrated. That is, GDP has a long run relationship with MS, LR and EXTR.

The ordinary least square (OLS) result conducted on the specified model is presented on table 3. The OLS result reveals the short run relationship that exists between the dependent variable and each of the explanatory variables.

**Table 3.** Ordinary Least Square (OLS) Result  
 Dependent Variable: GDP  
 Method: Least Squares  
 Sample: 1981 2017  
 Included observations: 37

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-5078.590	2289.559	-2.218152	0.0335
MS	4.238047	0.088132	48.08757	0.0000
LR	124.5411	47.42541	2.626041	0.0130
EXTR	0.178642	0.038594	4.628818	0.0001
R-squared	0.994211	Mean dependent var		24780.36
Adjusted R-squared	0.993685	S.D. dependent var		34143.57
S.E. of regression	2713.289	Akaike info criterion		18.75152
Sum squared resid	2.43E+08	Schwarz criterion		18.92567
Log likelihood	-342.9031	Hannan-Quinn criter.		18.81291
F-statistic	1889.233	Durbin-Watson stat		1.285929
Prob(F-statistic)	0.000000			

From the result of the OLS, the constant parameter (bo) is negative at -5078.590 This means that if all the independent variables are held constant, GDP as a dependent variable will on the average decrease by 5078.59 units. For MS, the coefficient is 4.238047. This means that MS is positively related to GDP. This implied that on the average, one unit increase in MS will lead to 4.238047 units increase in GDP and this is in conformity to the aprori expectation. The result also showed that the coefficient of LR is 124.5411. This means that LR is positively related to GDP. This implied that on the average, one unit increase in LR will lead to 124.5411 units increase in GDP and is also in conformity to the aprori expectation. The result showed that the coefficient of EXTR is 0.178642 implying that that there is a positive relationship between EXTR and GDP. The result shows that on the average, one unit increase in EXTR will lead to 0.178642 units increase in GDP and is in conformity to the aprori expectation. The R-squared value of 0.994 showed that about 99 % of the total variations in the dependent variable (GDP) were explained by changes in the explanatory variables (MS, LR, and EXTR). The F-statistic of 1889.233 with the corresponding probability value of 0.0000 measured the adequacy of the regression model and the overall influence of MS, LR, and EXTR on GDP. Since  $P = 0.000 < 0.05$  (level of significance), the model was a good fit and the explanatory variables (MS, LR and EXTR) jointly exerted a statistically significant effect on the dependent variable (GDP). The Durbin-Watson value of 1.285929 showed the presence of positive autocorrelation.

The next step is to perform the error correction method to account for short- run dynamic adjustments required for stable long run relationship among the variables in the model. The error correction result is presented on table 4

**Table 4** Error Correction Results.  
 Dependent Variable: D(GDP)  
 Method: Least Squares  
 Sample (adjusted): 1982 2017  
 Included observations: 36 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	791.8729	489.5255	1.617634	0.1159
D(MS)	3.097467	0.405848	7.632082	0.0000
D(LR)	66.51033	40.96995	1.623393	0.1146
D(EXTR)	0.210067	0.075906	2.767468	0.0094
ECM(-1)	-0.567886	0.172019	-3.301292	0.0024

R-squared	0.664262	Mean dependent var	3154.633
Adjusted R-squared	0.620941	S.D. dependent var	3749.107
S.E. of regression	2308.243	Akaike info criterion	18.45461
Sum squared resid	1.65E+08	Schwarz criterion	18.67454
Log likelihood	-327.1829	Hannan-Quinn criter.	18.53137
F-statistic	15.33345	Durbin-Watson stat	1.377126
Prob(F-statistic)	0.000001		

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In the error correction result as shown on table 4, the error correction term ECM (-1) is correctly specified. It is negative and statistically significant. This means that it will be effective to correct any deviations from the long-run equilibrium. Moreover, the negative and statistically significant of the ECM confirms that the variables in the model are co-integrated. The coefficient of the ECM(-1) which is -0.567886 indicates that the speed of adjustment to long run equilibrium is 56.79 percent when any past deviation must be corrected in the present period. The coefficient of determination ( $R^2$ ) in error correction is 0.664262. This means that about 66.43 percent of the variations in the dependent variable (GDP) are explained jointly by changes in the explanatory variables in the model. The F-statistic of 15.33345 with probability of 0.000001 is significant. This means that the explanatory variables in the model (MS, LR and EXTR) are jointly significant. The result showed that all the explanatory variables have positive relationship with the dependent variable (GDP) and they were also statistically significant except LR that was not statistically significant.

**4.1 Summary:** The impact of monetary policy on economic growth of Nigeria for the period 1981 – 2017 has been examined in this study. The regression result showed that all explanatory variables in the model (MS, LR and EXTR) were statistically significant and they also have a positive impact on economic growth in Nigeria. The error correction result showed that all the explanatory variables have a positive relationship with economic growth and they were all statistically significant except LR that was not statistically significant. The joint effect of the explanatory variables on the dependent variable was statistically significant implying that these variables were considered important variables in explaining changes in economic growth proxied by GDP in Nigeria within the period of study. The modeled and operationalized framework of analysis exhibited a very high explanatory power, thereby providing supporting evidence that the explanatory variables included in the model were relevant in explaining changes in economic growth (GDP) in Nigeria within the period of study.

#### **4.2 Conclusion:**

Given that the joint effect of the explanatory variables on the dependent variable were statistically significant, the study concludes that the explanatory variables considered in this study are important variables in explaining economic growth in Nigeria within the period of study.

#### **4.3 Recommendations:**

Based on the findings, the study recommends that the central bank should adopt appropriate monetary policy by ensuring that optimum level of money supply, and liquidity ratio that will effectively and efficiently stimulate economic activities are maintained in the economy. Moreover, care should be taken to ensure our external reserves are effectively managed.

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