Evaluating the Impact of Monetary Policy on the Growth of Emerging Economy: Nigerian Experience

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Evaluating the Impact of Monetary Policy on the Growth of Emerging Economy: Nigerian Experience

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Abstract   The study evaluated the impact of monetary policy on the growth of emerging economy: Nigerian experience. It was not a gain saying that monetary policy played significant roles in any country's financial growth and development both in high and low income economies, but are constrained by fiscal dominance, high cost of funds, high inflation etc., but exchange rate, interest rate, money supply and foreign reserve are some of the significant monetary policy indicators that can ascertain national economic growth. The study covers between 1990 and 2012, the scope is considered because it fell within the era of market-based monetary period. Automated Statistical Package Technique (ASPT) was used to analyse the model. The Ordinary Least Square (OLS) technique was adopted in the study in order to assess the relationship among the economic variables. The paper concludes that the major problem of monetary policy was as a result of the CBN's inability to control the money supply and bank credits, which were very essential for measuring and proffering solution to the substantial credit spreads between short-term central bank policy rates and the rates facing households and firms in the economy. The study recommended that the government should implement countercyclical policy that would lead to the desired expansion of output (and employment); though, it entailed an increase in the money supply, which would also result in an increase in prices, but policymakers should commit to holistic policies, rules and regulations that would remove full discretion in adjusting monetary policy.

Keywords   Monetary Policy, Money supply, Economic growth, Exchange rate, Nigeria

1. Introduction

In recent years, Central banks have always critically explained monetary policy framework and remained exact about the targeted objectives with reference to policy goals; this was as a result of global financial crunch that hit Nigeria in the first quarter of 2008, which started in Europe, part of Asia and America in 2007; which had however compelled Central banks around the world to be confronted with a new and complex set of challenges, which were apparently marked by threats to the liquidity and solvency of financial institutions [1-3]. The economic lull situation of recent era precipitated the CBN to further inform and educate the general public about the macroeconomic models on which economic policy analysis was based, and which were made available to banking institutions, non- banking institutions, financial markets and the public at large so as to enhance credibility, high employment, price stability and to stem depression as experienced in 1930s during the 'big bang' regime [4-6]. Monetary policy was regarded as the major

economic stabilization 'tools' that is used to measure, regulate, control the volume, cost availability, and direction of money and credit within an economy in order to achieve some specified macro-economic policy objectives; such as employment generation, balance of payment equilibrium, rapid economic growth, etc. The formulation and implementation of monetary policy was the primary responsibilities of the monetary authorities; and the Central Bank of Nigeria (CBN) with acting capacity as an agent of government, which oversees and directs the overall money supply towards achieving major economic policy objectives [1]. The policy goals play major roles in the achieving the objectives of full employment, price stability, economic growth and stability by providing link between the external and government sector and other sectors. Monetary policy was the process of adjusting the supply of money in the economy to achieve some combination of inflation and output stabilization [7]. To sustain monetary stability in an economy, it remained the ability of CBN to implement policies through the Deposit Money Banks (DMBs) that guarantee development of the economy via expected changes in the level of money supply and the reserves of banks; however, this process could easily be influenced by the CBN through various monetary policy instruments to adjudge the trend –behaviour of reserves; therefore, it is now obvious

that a higher degree of monetary policy predictability is particularly relevant for banks, non-banks and financial markets, where the inaccurate prediction of a central bank's actions can lead to large financial losses. It is therefore in the interest of financial market and other participants in the financial sector to understand what central banks do and to take note of what is communicated [8, 9, 5].

2. Literature Review

[10] argued that monetary policy encompass action of the apex regulatory authority (CBN) that directly affect the availability and the cost of both investment and commercial bank's reserves balances; and indirectly affecting the overall monetary and credit condition in the economy. He added that the rationale behind this statement was to ascertain the expansion of money and credit that will be adequate for the long run needs of an emerging economy such as Nigeria. The assertion of [10] was further supported by another scholar, [11]. [11] claimed that monetary policy was assessed in order to achieve the national economic goals, off full employment without inflation and balance of payment equilibrium through the control of economic supply of money and credit. [12] and [6] argued that the targeting of inflation to be a single digit and exchange rate policy to remain one of the CBN's monetary policy target were only based on an assumption as an essential tools of achieving macroeconomic stability in any economy (emerging market, developing and developed economies).

[13] and [9] argued that monetary policy decisions of Central Banks could create surprises which may affect outcomes from household decisions as regards jobs to offer and where to have shelter, as well as firms to undertake decisions on hiring and investing in physical capital, which may turn out well or poorly depending on the course of monetary policy and its unimaginable effects on the economy. Though, during economic recession period, consumers take decisions to stop spending as much as they used to, thereby leading to business production declines, the leading firms would be forced to lay off workers and stop investing in new capacity; and foreign appetite for the country's exports may experience a total decline; this scenario however examines the decline in aggregate demand to which government could respond with a policy that leans against the direction in which the economy is headed [14, 1].

[1] asserted that in the long run output is fixed, so any changes in the money supply only cause prices to change. But in the short run, because prices and wages usually do not adjust immediately, changes in the money supply can affect the actual production of goods and services. This is could be seen as one of the reasons the monetary policy is generally conducted by central banks such as a meaningful policy tool for achieving both inflation, price stability and growth objectives.

2.1. The Nigerian Banking and Monetary Policy System

During the past two years, central banks worldwide have cut policy rates sharply, some cases to zero. Nonetheless, they have found unconventional ways to continue easing policy [7, 1]. The Monetary Policy Rate (MPR) is the rate at which banks borrow from Central Bank to cover their immediate cash shortfall. The higher the cost of such borrowing, the higher also will be the rate banks will advance credit to the real sector. Unfortunately, reverse is the case in Nigeria, the monetary policy rate has increased from 12% to 13% in 2014 [15]. The present MPR- 13% position is as a result in the response to the uptick in food inflation, and its reduction will lead to reduction in core inflation, Gross Domestic Growth; the decision was as a result of structural nature of inflationary pressures [15]. The Nigerian banking system started in the late 19th century, but grew with influence of colonial masters, who introduced banking services in Nigeria. Banking activities, mostly commercial, was not regulated in Nigeria until 1952, when the Banking Ordinance was promulgated. The Ordinance Act of 1952, led to the establishment of Central Bank of Nigeria (CBN) in July 1, 1958, started operation in 1959; but with amended CBN Act, 2007, the apex bank has continued to play the traditional roles of regulating the stock money in order to promote monetary stability, sound financial system, to achieve high employment opportunities, rapid economic growth, price stability, effectively managing inflation and creating enabling environment to achieve national economic growth. However, these objectives among others have been realized via the use of monetary policy tools [16, 6].

The global economic activities are towards downside risks to growth trend, including the softening commodity prices, and heightening threats to financial system in the emerging economies (i.e. including Nigeria). Developments in the international oil market have intensified the risks and vulnerabilities due to decline in global price; and where oil importing country (i.e. United States), which has also emerged as a major oil exporter calls for concern [17]. However, CBN use methods to stabilize the economy via economic parameters such as Open Market Operations (OMO). These operations are conducted wholly on Nigerian Treasury Bills (TBs) and complimented with the use of reserve requirements, the Cash Reserve Ratio (CRR) etc. The Cash Reserve Ratio (CRR) is the amount of cash that banks have to keep with the Central Bank and is often used to control excess liquidity in the economy. Cash Reserve Requirement (CRR) has increased from 50% to 75% on all government deposit with commercial banks and increase from 12% to 15% on private deposit with commercial banks [17]. The adoption of 75% on public deposit and 15% on private deposit of CRR would not protect the pressure on exchange rate and inflation as a result of continuous increase in government spending culture most especially during election year -2015. But, it is good to know that these set of instruments are used to influence the monetary aggregates via a monetary processes. Changing monetary policy has a very crucial effects on aggregate demand, and thus on both output and prices. There are number of ways in which policy actions get transmitted to the real economy, which may be

via the interest rate channel. During the rise in borrowing costs of CBN, consumers are a likely to involve in finance and businesses, which may hardened the likelihood of channelling funds to investment opportunities; and this reduced the level of economic activity, but with a consistent lower inflation, this would likely result to lower demand, which usually means lower prices. It must be noted that a rise in interest rates also tends to reduce the net worth of businesses and individuals (i.e. making it tougher to qualify for loans at any interest rate and reducing spending and price pressures). Also, banks' profits are less in general and not willing to lend; it further leads to an appreciation of the currency, as foreign investors seek higher returns and increase their demand for the currency [7]. [1] further argued that through the exchange rate channel, exports are reduced as they become more expensive, and imports rise as they become cheaper. In turn, GDP shrinks. Monetary policy has an important additional effect on inflation through expectations. Many wage and price contracts are agreed to in advance, based on projections of inflation, if policymakers hike interest rates and further communicate anticipated hikes at appropriate time, this may convince the public that policymakers are serious about keeping inflation under control. Long-term contracts will then build in more modest wage and price increases over time, which in turn will keep actual inflation low.

It must be noted that the Minimum Rediscount Rate (MRR) was used as the price-based technique to influence the movement of cost of funds in the economy; though, the changes in this rate provides a platform for the monetary disposition of the Bank. This rate has continuous been pecked within the range of 26 and 8 percent since Structural Adjustment Programme (SAP) regime in August, 1986. However, to compliment the use of the MRR, the CBN eventually introduced the Monetary Policy Rate (MPR) in 2006 which establishes an interest rate corridor of either plus (+) or minus (-) two (2) percentage points of the prevailing MPR [18, 19].

2.2. Interest Rate, Inflation Rate and Economic Growth in Nigeria

Interest rate is the rental payment for credit usage by borrowers, investors and returns for parting with lenders' liquidity. Also, Interest rate may be regarded as the price of the credit that is ambiguous due to inflationary pressure. The low interest rate regime attracts lower cost of borrowing by investors, with increase in investment and the purchase of consumer durables. A low interest rate strengthens the banks to relax the lending policy in order to promote and guild firms and household spending pattern. A low interest rate can force local currency to be devalued, as a result of demand for domestic goods rises, most especially when imported goods become costly. These factors among others would necessitate economic growth, consumer spending pattern and investment [20, 21]. However, economic growth is a proportion of a country's potential output. Economic growth

has re-examined the reality behind the disparity in growth rate of countries overtime; and this act has influenced government decisions on spending pattern and tax rate regime in order to realize easy growth rate [22]. The average real GDP rate was less than 6% in 1970s, and later became worse, until the economic reform of August, 1986. Since then, positive GDP has been sustained till date, (5.5%), but at a very low rate.

Inflation remains the continuous rise in prices of goods and services without corresponding increase in output. The Nigerian economy seemed to have experienced moderate inflation before the economic reform in 1986. There exists a positive relationship between inflation and growth in the short run, but economies with continuous increase in inflation rate may be forced to face some macro-economic challenges - low purchasing power of the local currency, poor price system and fluctuation of exchange rate etc. (CBN, 2014) Within three months, inflation dropped to 8.6% in March from 9.5% as recorded in February 2013. It shows that the monetary tightening policies of CBN have not kept employment to full employment, and increase the value of the domestic currency (naira). [23] argued that the instability in the financial market and banks, have shown that the Central Bank's inability to actively manage the monetary policies have negative effect on the economy, thereby leading to increase in demand for dollars and with undesirable effect on resource allocation. High inflation has been found to have undesirable consequences on economic parameters. Inflation was 12.24% in 2012 and 9.1% as at June, 2013, 7.1% in 2014 and as February, 2015, it was 8.2%. Nigeria has experienced high inflation, thereby targeting the real interest rate on a negative trend most of the time. This act has made interest rate to be difficult to control, and the real interest rate remaining negative, savings and investment have remained low, and the economy has experienced weak industrial infrastructure. [19] argued that the high rate of inflation in the economy has tendency to reduce demand for bank's financial assets and hence, impair the process of financial intermediation in the banking sector as deposits would move from the banking system into real estate and inventory speculations among others.

3. Methodology

To evaluate the impact of monetary policy on the growth of emerging economies: Nigerian experience requires establishing the association between the variables for this study; Ordinary Least Square (OLS) technique was adopted in order to effectively capture the relationship between monetary policy variables and economic growth and arrive at a logical conclusion. The OLS minimizes the sum of squared errors and "fit" a function with the data [24]. The secondary source of data was adopted, such as references, books, internet, CBN online annual Bulletin of 2012. In this study, the equation is estimated in order to know the extent to which the predetermined variables chosen influence the

endogenous variables in the equations, and to investigate the functional relationship between gross domestic product (Measures real economic activity) and inflation rate (measures the increase in the general level of prices for goods and services), interest rate (monetary policy rate), money supply (broad money), and exchange rate (real effective exchange rate). However, model specification is presented below:

$$Y_t = \alpha_0 + \beta_1 X_t + \mu_t$$

Where,

Y_t is a function of independent variable which is X_t

μ_t is a stochastic variable, it is a variable that influences the dependent variable but not included in regression equation parameter.

α_0 and β_1 are estimate parameters / regression coefficients of the equation.

Given the above assumptions about the stochastic variable, the unexplained or residual part of the regression equation is assumed to be zero or completely ignored since the expected value is zero. Therefore, it was concluded that there is no relationship that exists between the dependent variable and the stochastic variable. Hence, the above model adopts these models for the study as stated thus:

MODEL I

$$\text{Ln RGDP} = \alpha_0 + \beta_1 \text{ Ln INF} + \mu_t \tag{1}$$

Equation 1 above shall test the impact of inflation rate on gross domestic product in Nigeria.

Where

RGDP = Real Gross Domestic Product
INF = Interest Rate
α_0 and β_1 =   are estimate parameter
μ_t = Stochastic variable/Error term
Ln = Log function on the explanatory variables

MODEL II

$$\text{Ln RGDP} = \alpha_0 + \beta_2 \text{ Ln INT} + \mu_{2t} \tag{2}$$

Equation 2 above shall test the impact of interest rate on gross domestic product in Nigeria.

Where

RGDP = Real Gross Domestic Product
INT = Interest Rate
α_0 and β_2 =   are estimate parameter
μ_{2t} = Stochastic variable/Error term
Ln = Log function on the explanatory variables

MODEL III

$$\text{Ln RGDP} = \alpha_0 + \beta_3 \text{ Ln MS} + \mu_{3t} \tag{3}$$

Equation 3 above shall test the impact of money supply on Gross domestic product in Nigeria.

Where,

RGDP = Real Gross Domestic Product
MS = Money Supply
α_0 and β_3 =   are estimate parameter

μ_{3t} = Stochastic variable/Error term
Ln = Log function on the explanatory variables

MODEL IV

$$\text{Ln RGDP} = \alpha_0 + \beta_4 \text{ Ln EXR} + \mu_{4t} \tag{4}$$

Equation 4 above shall test the impact of Exchange rate on Gross domestic product in Nigeria.

Where

RGDP = Real Gross Domestic Product
EXR = Exchange Rate
α_0 and β_4 =   are estimate parameter
μ_{5t} = Stochastic variable/Error term
Ln = Log function on the explanatory variables

MODEL V

$$\text{Ln GDP} = \alpha_0 + \beta_1 \text{ Ln INF} + \beta_2 \text{ Ln INT} + \beta_3 \text{ Ln MS} + \beta_4 \text{ Ln EXR} + \mu_{5t} \tag{5}$$

Equation 5 above shall test the impact of inflation rate, interest rate (monetary policy rate), money supply, consumer price index and exchange rate in Nigeria.

Where

$\alpha_0, \beta_1, \beta_2, \beta_3,$ and β_4 - are estimate parameter

All the variables remained as defined above, μ_{6t} is stochastic variable/Error term.

The ratio of explained variation to the total variation which is called the coefficient of determination can be represented by R^2. It is used to show the percentage of total variation i.e. independent variables that are explained by the independent variable. The ratio lies between 0 and 1 and the nearer to 1, the greater is the explanatory ability of the estimates. However, in order to determine the goodness of fit of the regression line and reliability of the result the quantitative tools such as the adjusted co-efficient of determination (adjusted R^2), T – statistic, f-statistics and the Durbin Watson Statistic will be employed.

It must be noted that in order to realize a strong existing association between monetary policy variables and economic growth, there is need to adopt simple econometric model (Error Correction Model) (ECM) to reconcile fluctuations or dynamism that may exist both in the short and long run between the variablesas in the estimation.

Recall, the regression of a non-stationarity time series on another non-stationary time series may produce a spurious regression. Therefore, it is essential to affirm whether the variables can be co-integrated by carrying out configuration test. A linear relationship of two or more no-stationary series, which may be stationary. Where such a stationary that is, I (o), a linear relationship exists, the non-stationary that is, I (1) however, with a unit root, time series are expected to be co-integrated. The stationary linear relationship is called co-integrating equation and explained a stable long-run relationship among the non-stationarity time series variables [25, 26, 27]. The model stated thus:

$$\triangle \text{RGDP}_t = \alpha_0 + \sum_{i=1}^{n} \beta_{1i} \triangle \text{INF}_{t-i} + \sum_{i=1}^{n} \beta_2 i \triangle \text{INT}_{t-i} + \sum_{i=1}^{n} \beta_3 i \triangle \text{MS}_{t-i} + \sum_{i=1}^{n} \beta_3 i \triangle \text{REXR}_{t-i} + V_t \tag{6}$$

Where: $\triangle$ = first difference operator

        RGDP = Real Gross Domestic Product

        α_0 = constant / intercept

        INF = Inflation rate

        INT = Interest rate

        MS = Money supply

        REXR = Real Exchange rate

        t – I = Lag values

        V_t = Disturbance error term.

However, because the study entails time series data, the ordinary least square (OLS) method cannot be applied unless it is established that the variables concerned are stationary. For this paper, we have applied unit root test to check the stationarity of the variables under study. Specifically, the Augmented Dickey-Fuller (ADF) and Phillip-Perron test (PP) are used; the ADF and PP are used to avoid spurious regression thereby subjecting each of the variables used to unit root test so as to determine their orders of integration since unit root problem is a common feature of most time series data.

4. Empirical Result

The regression test in table 1 below showed that the relationship between real gross domestic product and inflation with R^2 (0.07), Adjusted R-squared (0.044), Durbin Watson Statistics (0.30), which is far and less from 2; this shows auto correlation on the explanatory variable also with a high significant probability of 0.17 less than the significant level of 5%; akaike info criterion = 22.11 and Schwarz criterion = 23.13 (both akaike info criterion and Schwarz criterion show the extent on how insignificant variables are removed to the minimum), f statistics-1.214601. The negative t-statistics (-1.5) result on inflation shows that high inflation (2-digits) or above 6%-7.5% may affect national economic growth resulting to targeting the real interest rate on a negative trend most of the time. The result further shows that the two variables i.e. dependent and independent variables are statistically related. The economic implication of the rightly signed parameter is that the increase in inflation makes naira to have less purchasing power. Nigerian economy is growing very fast, which remains a good trend, but it may allow shortages because the people (i.e. consumers) are demanding for goods and services faster than the supplied trend. Therefore, it is an option for CBN to introduce countercyclical monetary technique in order to completely abate increasing inflation rate.

The regression result in table 2 below showed that the relationship between real gross domestic product and interest rate (MPR) with R^2 (0.07), Adjusted R-squared (0.06), Durbin Watson Statistics (0.71), which is not far from 1 but from 2; this shows a high auto correlation on the explanatory variable also with a high significant probability of 0.51; akaike info criterion = 16.32 and Schwarz criterion =16.41 (both akaike info criterion and Schwarz criterion show the extent on how insignificant variables are removed to the

minimum), f statistics =3.2. The result shows that there is a statistical negative relationship - t-statistics (-1.4), which shows that there is a negative relationship that exists between interest rate and economic growth, considering the structural nature of inflationary trend, pressure and complete pro-cyclical nature of Nigerian economy.

Table 1. Regression Result between GDP and Inflation Rate

Dependent Variable: GDP

Method: Least Squares

Sample: 1990 – 2012

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	419366.6	153542.9	2.731266	0.0116
INF	-15852.82	10907.29	-1.453415	0.1591
R-squared	0.070237	Mean dependent var		142706.7
Adjusted R-squared	0.043721	S.D. dependent var		217788.2
S.E. of regression	322189.4	Akaike info criterion		22.11200
Sum squared resid	1.57E+13	Schwarz criterion		23.13280
Log likelihood	-157.3634	F-statistic		1.214601
Durbin-Watson stat	0.301042	Prob(F-statistic)		0.166221

Table 2. Regression Result Between GDP and Monetary Policy Rate (Interest rate)

Dependent Variable: GDP

Method: Least Squares

Sample: 1990 – 2012

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	304245.7	162477.3	2.413647	0.0203
MPR	15332.02	12487.25	-1.362243	0.3541
R-squared	0.077018	Mean dependent var		221211.6
Adjusted R-squared	0.059081	S.D. dependent var		120528.2
S.E. of regression	314983.6	Akaike info criterion		16.32103
Sum squared resid	3.25E+14	Schwarz criterion		16.41021
Log likelihood	-228.0241	F-statistic		3.201254
Durbin-Watson stat	0.721135	Prob(F-statistic)		0.511248

The result in table 3 showed that the relationship between real gross domestic product and Money supply (MS) with R^2 (0.07), Adjusted R-squared (0.068), Durbin Watson Statistics (0.56), which is not far from 1 but from 2; this shows a high auto correlation on the explanatory variable also with a low significant probability of 0.15; akaike info criterion = 19.21 and Schwarz criterion =19.36 (both akaike info criterion and Schwarz criterion show the extent on how insignificant variables are removed to the minimum), f statistics = 4.21. The result shows that there is a significant growth in money supply (t-statistics =0.6), which may be crucial in explaining how governments resort to money creation to finance its expenditure; it however, increases the nominal stock of money and consequently increases demand for goods and services. If output does not grow in tandem to meet this increase in demand, an upward pressure on prices will be unveiled. It can be concluded that changes in money

supply have continuously caused higher changes in price, and hence inflation.

Table 3. Regression Result between GDP and Money Supply

Dependent Variable: GDP

Method: Least Squares

Sample: 1990 – 2012

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-51215.21	221743.2	-0.214438	0.6215
MS	16210.22	10506.24	0.630211	0.1213
R-squared	0.070521	Mean dependent var		124716.2
Adjusted R-squared	0.068151	S.D. dependent var		204668.1
S.E. of regression	114521.1	Akaike info criterion		19.20620
Sum squared resid	1.42E+11	Schwarz criterion		19.36112
Log likelihood	-224.4626	F-statistic		4.212851
Durbin-Watson stat	0.558101	Prob(F-statistic)		0.152414

Table 4. Regression Result between GDP and Money Supply

Dependent Variable: GDP

Method: Least Squares

Sample: 1990 – 2012

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	60130.21	189295.2	0.492613	0.8121
EXR	12134.31	14561.01	0.629142	0.5317
R-squared	0.081271	Mean dependent var		154736.2
Adjusted R-squared	0.604612	S.D. dependent var		182508.1
S.E. of regression	302301.1	Akaike info criterion		17.27202
Sum squared resid	2.52E+12	Schwarz criterion		17.46205
Log likelihood	-250.5164	F-statistic		0.949902
Durbin-Watson stat	0.529612	Prob(F-statistic)		0.521511

The test result in table 4 showed that the relationship between real gross domestic product and Exchange Rate (EXR) with R^2 (0.08), Adjusted R-squared (0.06), Durbin Watson Statistics (0.53), which is not far from 1 but from 2; this shows a high auto correlation on the explanatory variable also with a low significant probability of 0.52; akaike info criterion = 17.27 and Schwarz criterion =17.46 (both akaike info criterion and Schwarz criterion show the extent on how insignificant variables are removed to the minimum), f statistics = 0.96. The result shows that there is a significant growth in monetary approach to exchange rate lead to increase in the value of Nigerian domestic currency (t-statistics =0.63). The 0.63 result in 2012 showed an appreciating exchange rate to output and presently the output is low, which depicts low exchange (i.e. the purchasing power of the naira has continued to reduce). The exchange rate today shows #199.9 = USD$1 (CBN, 2015). However, the exchange rate is highly volatile because the rate of change in exchange rate is far higher than the change in output. The present depreciating trend in the exchange rate is due to global crude oil price crash, the negative effect of global economic and financial crunch of 2008 has not been completely removed, over dependence on the consumption of imported goods etc. have resulted to sluggish economic growth in Nigeria.

The table 5 below showed a combined subsisting relationships among real gross domestic product and inflation, monetary policy rate (interest rate), money supply (MS) and Exchange Rate (EXR) with R^2 (0.67), Adjusted R-squared (0.78), Durbin Watson Statistics (0.82), which is very close to 1 but far from 2; this shows a high auto correlation on the explanatory variable also with a high significant probability of 0.09; akaike info criterion = 10.13 and Schwarz criterion =10.34 (both akaike info criterion and Schwarz criterion show the extent on how insignificant variables are removed to the minimum), f statistics = 10.12. The result shows that there is a multi –relationships among the economic variables; (i.e. t-statistics = -0.5, 0.4, 0.6 and -3.3 for inflation, exchange rate, monetary policy rate – interest rate and money supply). The negative result in inflation and money supply may be as a result of possible money illusion in financial markets, (i.e. to ignore inflation during financial calculations on financial market's data and report). The result of monetary policy and exchange rate requires that monetary policy bears the burden of reviving economic growth with a rule that will remove the discretions, even though it would vary with time due to different economy's socio-economic foundations, belief and existing structures.

Table 5. Regression Result between GDP, Inflation, Monetary Policy Rate Exchange rate and Money Supply

Dependent Variable: GDP

Method: Least Squares

Sample: 1990 – 2012

Included observations: 22

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	785415.1	102368.1	5.621647	0.0000
LNINF	-14329.22	10181.22	-0.486842	0.4151
LNEXR	101290.3	154721.2	0.437764	0.6211
LNMPR	7921.221	11351.31	0.582172	0.4721
LNMS	-18162.32	10243.92	-3.302015	0.0121
R-squared	0.874216	Mean dependent var		211703.5
Adjusted R-squared	0.778012	S.D. dependent var		325018.6
S.E. of regression	248110.3	Akaike info criterion		10.13421
Sum squared resid	2.68E+14	Schwarz criterion		10.34202
Log likelihood	-320.4021	F-statistic		10.12814
Durbin-Watson stat	0.818182	Prob(F-statistic)		0.09921

The results of ADF test in the table 6 below showed that real GDP and exchange rate and inflation variables are stationary at first difference, but interest rate and money supply are stationary at levels. This means all the variables are integrated of order 0 and 1.

The Phillip-Perron test results in table 7 below showed that real GDP, inflation and real exchange rate are stationary at first difference, but interest rate is stationary at levels, except for money supply that is stationary at second

difference.

Table 6. Augmented-Dickey Fuller (ADF) Test

Variables	ADF Values	Critical Values	Decision
RGDP	4.0214	2.2435	I(1)
INF	-2.6124	-1.1267	I(1)
INT	-3.1252	-1.7212	1(0)
MS	-5.2143	-3.1245	I(0)
REXR	-2.1421	-1.2312	I(1)

From table 8 below, it was observed that both Trace test statistic and the Max-Eigenvalue test indicated co-integrating equation at 1% and 5% level of significance.

Based on this evidence, there was a long run relationship exists among the variables.

Table 7. Phillip-Perron (PP)

Variables	ADF Values	Critical Values	Decision
RGDP	1.5216	3.1531	I(1)
INF	-1.4185	-4.2123	I(1)
INT	-5.2214	-2.1314	1(0)
MS	-2.1171	-1.1251	I(2)
REXR	-1.2511	-2.4215	I(1)

Table 8. Johansen-Juselius Co-integration Test Results

Sample (adjusted): 1990 – 2012

Included observations: 21 after adjusting endpoints

Trend assumption: No deterministic trend (restricted constant)

Lags interval (in first differences): No lags

Unrestricted Cointegration Rank Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.721210	52.17471	17.21	20.21
At most 1	0.116282	6.120912	7.41	11.52

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Trace test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.613562	40.53818	13.21	12.50
At most 1	0.313016	5.712462	7.51	11.53

*(**) denotes rejection of the hypothesis at the 5%(1%) level

Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels

Table 9. Parsimonious Error Correction Estimates

Dependent Variable: D(LNRGDP)

Method: Least Squares

Sample(adjusted): 1990 – 2012

Included observations: 22 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.032768	0.010132	1.524531	0.2135
DLNRGDP(-1)	0.128641	0.460106	0.807211	0.1724
DLNRGDP(-2)	0.321293	0.200131	0.612112	0.1127
DLNINF(-1)	0.120172	0.113827	-1.213725	0.0382
DLNINF(-2)	0.612151	0.269819	-1.625763	0.0138
DLNINT(-1)	- 0.412479	0.312893	-2.218794	0.0321
DLNINT(-2)	- 0.213421	0.161947	-0.129295	0.0114
DLNMS(-1)	-0.112401	0.611631	-1.211638	0.0043
DLNMS(-2)	0.126779	0.581142	1.121461	0.0445
DLNREXR(-1)	- 0.701421	0.127219	3.216142	0.0102
DLNREXR(-2)	- 0.501214	0.251321	1.421722	0.0022
ECM(-1)	-0.512145	0.150213	-3.217114	0.0115
R-squared	0.685621	Mean dependent var		0.012112
Adjusted R-squared	0.546061	S.D. dependent var		0.121121
S.E. of regression	0.121402	Akaike info criterion		-1.451211
Sum squared resid	0.124241	Schwarz criterion		-1.442527
Log likelihood	20.21528	F-statistic		4.225151
Durbin-Watson stat	0.502135	Prob(F-statistic)		0.000332

The table 9 above showed results of the Parsimonious Error Correction Estimates that revealed the existence of cointegration among variables in the economic growth models and which is assumed to be appropriate for the study. This parsimonious encompassing models further explained that based on Akaike Info Criterion (AIC) or Schiwarz Info Criterion (SIC), the re-parameterize model ensures that insignificant variables are excluded until Information Criterion (IC) start rising. In order to ascertain a goodness of fit test, the models that emerged is slightly significant to the over-parameterized ones. The dynamic parsimonious result for model showed that the explanatory variables accounted for 68.56% variations in the level over the entire sample period. The findings showed that 51.21% errors are corrected every year; recall, the Error Correction Term (ECT) must be negative and significant. The Durbin Watson (D.W) statistics of 0.50 (which is less than 1, but far from 2) shows the presence of auto-correlation among the dependent and independent variables and the assumption of linearity is not violated.

5. Conclusions

This study helps to evaluate the impact of monetary policy on the growth of emerging economy: Nigerian experience. The study affirmed a long-term existing relationship among real gross domestic product interest rate, inflation, money supply and exchange rate. The paper observed that the improvement recorded in 2014 (i.e. Nigerian economy the best in Africa and the world) could be attributed to the slight high purchasing power in the country during the period, as well as the application of monetary policy measures by the CBN to mop up excess liquidity in the economy. The study shows that interest rate, money supply and exchange rate will automatically assist in the mobilization and utilization process of financial resources to achieve a desired national economic growth, but the administration of monetary policy structure is weak in Nigeria. The paper discovers that Nigerian Government aspiration of 10% GDP growth rate appears to be rather too ambitious because the crucial economic indicators (monetary policy -rate interest rate, inflation rate, money supply and exchange rate etc. have not been well examined during monetary policy committee meetings. The inability of Monetary Policy Committee (MPC), policymakers, regulators and other concern stakeholders to effectively maximize policy objective may serve as a shortcomings limiting the objective of price stability, stable exchange rate and national economic growth. CBN and NDIC should formulate policies and initiatives to re-position the banks, non-financial institutions and financial market in order to actively play its roles in the growth of the Nigerian economy. The paper further recommends a greater synergy existence between monetary and fiscal policies as economic stability stimulus, because continued expansionary monetary policies among developed countries would be required, but negative spillover effects into capital-flow and exchange-rate volatility must be thoroughly controlled and managed.

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