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The Effectiveness of Monetary Policy in the Control of Inflation in Nigeria: An Ecm Approach

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Abstract: *The paper investigated the effectiveness of selected monetary policy tools in the control of inflation in Nigeria. Data used are monthly data covering the period January, 2009 to December, 2016 sourced from Central Bank of Nigeria statistical bulletin2016. The study estimated the Augmented Dickey-Fuller (ADF) unit root test, Johansen Cointegration test and the Error Correction Model (ECM). Result of the ADF showed that all the variables are integrated of order I(1), except for the Error Correction Term (ECT) which is stationary of order I(0). The Johansen cointegration test result revealed the presence of a long-run relationship between inflation rate and the selected monetary policy variables. The ECM result revealed that the estimated model has a self-equilibrating mechanism of 12%. The paper concludes that Treasury Bill Rate (TBR) is an effective tool in controlling inflation both in the short and long run. While Exchange Rate(EXR) and Money Supply(MS) are very effective monetary policy tools in the control of inflation in the short run. Monetary Policy Rate (MPR)is effective in the long run. Therefore, it is recommended that the monetary authority in Nigeria should regulate EXR and MS in controlling inflation to achieve a short-term result. TBR should be used to control the rate of inflation both in the short and long-run, while MPR should be used to control inflation for a long-term result.*
Keywords*: Inflation, Money Supply, Exchange Rate, Monetary Policy Rate, Error Correction Model*

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I. Introduction

One of the key macroeconomic objective is the attainment of price stability, thus world economies strive to maintain a relatively stable price system through the use of various monetary and fiscal tools. Generally, Inflation has been seen as the persistent rise in the general price level of goods and services in an economy over a prolonged period of time. But this sustained rise in general price levels may nothave an adverse effect on the economy provided its (inflation) rates lies within certain predetermined thresholds that are country specific. Bawa and Abdullahi (2012) established a 13% threshold level of inflation for Nigeria using a threshold regression model developed by Khan and Senhadji (2001). Their result implies that, below 13%, inflation has a mild effect on economic activities, while above it, the magnitude ofinflation becomes negative on growth.

In the words of Orubu(2009), the Nigerian economy has witnessed different eras of severe inflationary pressure in the form of increase in prices of commodities and this increase have been a cause for concern for those in charge of the economy.Thus, Dolamore (2015) opined that the aim of macroeconomic policy is to provide a stable economic environment conducive to fostering strong and sustainable economic growth.

The Central Bank of Nigeria (CBN) adopts monetary policy measures to stabilize the economy and curb inflation to fall within acceptable as well as predetermined thresholds that will enhance the achievement of stated goals. But the absence of Central Banks' reaction will leave inflation to provoke currency devaluation, opening a vicious circle of negative economic reactions/outcomes (Piana, 2001).Job(2009) observed that the CBN commenced the implementation of inflation targeting (IT) regime as one of its core monetary policy strategies, by using the monetary policy rate (MPR) as the main tool of stabilization in 2009.

Recent policy indications from the CBN show that the bank may have soft-pedalled on its implementation of full-fledged inflation targeting for the country (Bassey and Essien, 2014). According to CBN (2014), open market operations (OMO) remained the main instruments of monetary policy, complemented by reserve requirement and discount window operations as well as the monetary policy rate (MPR), all intended to bring about stabilization of the economy. Therefore, the focal issue in this study is the effectiveness of monetary policy tools in curbing inflation and restraining inflationary pressures on the economy. The specific objectives of this study are to examine:

a. the impact ofmonetary aggregates on the inflation rate in Nigeria.
b. the effect of Monetary Policy Rate on the inflation rate in Nigeria.
c. the relationship between exchange rate and inflation in Nigeria.

d. the effect of treasury bills rate on the rate of inflation in Nigeria.

II. Theoretical Framework and Literature Review

2.1 The Structuralists' view of Inflation

The structuralists' approach was developed mainly in Latin America (Harberger, 1963). This school of thought is of the opinion that though money supply may increase along with price level,theincrease in money supply is only a response to inflation rather than its cause. They felt the cause of rising prices is due to the pressure of economic growth on an underdeveloped social and economic structure like in Nigeria. Their focal areas of analysis in terms of the causes of inflation are; import substitution (exchange rate) and money supply amongst others.

2.2 The Monetary Theory of Inflation

Modern quantity theorists view inflation as a monetary phenomenon that arises from a rapid expansion in the quantity of money than in total output (Friedman, 1956). Inflation everywhere is said to be based on an increased demand for goods and services as stated in the fact that people try to spend their cash balances (Jhingan, 2003). Their conclusion was that inflation is always a monetary phenomenon relying on Fisher's equation;

MV=PQ

Where; M- money supply, V- velocity of money, P- price level, Q- level of real output. V and Q are assumed constant, whilethe price level (P) varies proportionally with the supply of money (M).

In Nigeria, the attempts made to reduce the inflation rate have mainly been by adopting a monetarist approach and not the structuralist approach (Sanni and Folarin, 2010). The above task rests squarely on the shoulders of the Central Bank of any nation. This the Central Bank of Nigeria has been carrying out via its monetary policy framework. Saxegaard (2006), discovered that excess liquidity weakens monetary policy transmission mechanism and thus the ability of monetary authorities to influence demand conditions in the economy is essential for the success of monetary policy.

2.3 Monetary Policy and Inflation in Nigeria

The monetary policy experience in Nigeria could be divided into two broad policy regimes. They are direct and indirect method of control.

The Direct Method of Control: This period lasted from 1959 -1985. Banks operated passive monetary regime where control of monetary instruments was partially relaxed to focus on developing and maintaining a sound currency in the period 1960-1962. In 1962/63 the focus was on development with emphasis on adequate supply of credit to the economy with minimal inflationary pressure. But in the period (1966 – 1972), the policy direction of the monetary authority was lifting of restriction to enable the government prosecute the civil war. This resulted in deteriorating balance of payment position and inflationary pressure. However, policies were adopted for the remaining part of the period to reduce inflation. Given the rising oil prices in the period (1972-1976), the policy measures tilted towards expanding domestic aggregate output and reducing inflationary pressure. Because of the excess liquidity, selective credit control policy was used supported by interest rate and exchange rate policies with a view to stabilizing the system. Monetary restraint policy continued to be in place up till 1981 due to excess liquidity in the system. However, between (1981 – 1985) major changes which include: marginal upward adjustment of interest rates, loan advances to favour preferred sectors (agriculture and manufacturing) and unchanged cash reserve requirement was in place CBN (2001).

The Indirect Method of Control: This period started in the year 1986 when Structural Adjustment Program (SAP) was introduced. The primary aim of SAP was to restructure and diversify the productive base of the economy. In addition, SAP was designed to establish a realistic and sustainable exchange rate for the naira through trade and payment liberalization, tariff reforms and commercialization and privatization of public enterprises. As a direct consequence of the Structural Adjustment Programme (SAP) 1986, monetary policy was refocused to a one year perspective. A number of monetary targets and instruments were adopted which include, Open Market Operation (OMO) conducted wholly by using the Nigeria Treasury Bills (NTBs). This continued to be the primary technique of monetary policy. Other instruments include interest rate policy deregulation through proactive adjustment of minimum rediscount Rate (MRR), discount window operations and unification of the official and inter-bank exchange rate in 1999 (Uchendu, 2009).

Table 2.3.1. Monetary Policy Tools, Targets & Goals

Policy Instruments	Operating Targets	Intermediate Targets	Goals
Open Market Operations Discount rate Reserve Requirement	Short term Interest rate Reserve Money (Monetary Base) Required Reserve, Non-borrowed reserves etc.	Monetary Aggregates (M1, M2 etc) Interest rates (short & long term) Aggregate demand	Low unemployment rate Low inflation rate (Financial market)(stability) Stable exchange rate

Source: Adapted from Handa (2009)

2.4 Trends in Inflation and Economic Growth in Nigeria

Economists and policy makers in both developed and developing economies, largely agree that one of the major objectives of macroeconomic policies is to achieve as high an economic growth as possible together with a low level, single-digit inflation. This is not unrelated to the fact that the smooth functioning of a market economy is disrupted by a high level of inflation. However, the exact relationship between inflation and economic growth in an economy and how one affects the other is still widely debated. Some studies have been inconclusive on whether a positive or negative relationship exists between inflation and economic growth, while others found either a negative or a positive correlation.

An examination of the inflation and output growth in Nigeria as depicted in figure 2.1 showed much volatility in their movements, particularly inflation. During the SAP period, real GDP growth rate increased to an average of 5.7 per cent as a response to the economic adjustment policies, while inflation rate increased from an average of 15.9 per cent in 1980 to peak at an average rate of 35.8 per cent between 1987 and 1997. The rise in inflation in the 1980s was partly due to the collapse in the world oil market, foreign exchange constraints, and import restrictions, among others. while severe shortage of commodity supply, excess money supply and continuous labour and political unrest as a result of the annulment of June 12, 1993 election accounted for the rise in inflation rate in the 1990s (Ahortor, Adenekan and Ohemeng, 2011).

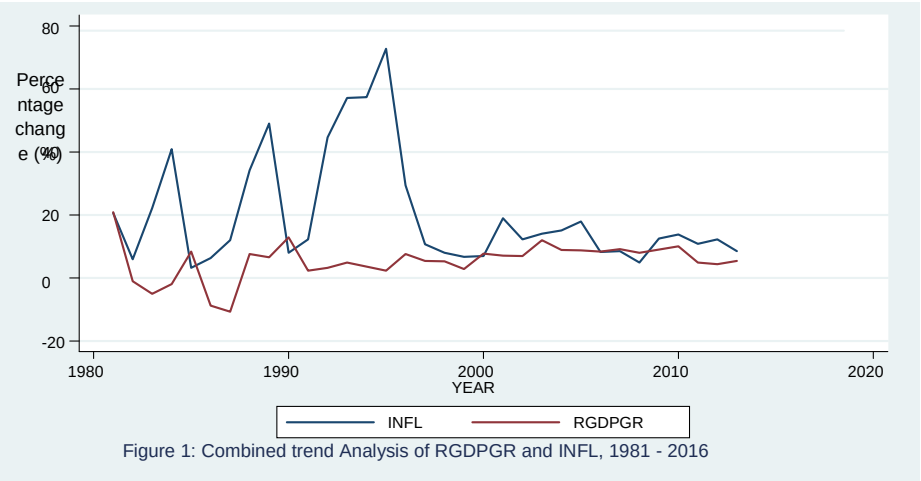

Figure 1: Combined trend Analysis of RGDPGR and INFL, 1981 - 2016

The trends of inflation rate in Nigeria indicate that the country has experienced episodes of low, moderate and high inflation. Three major episodes of high inflation exceeding 30 per cent have been identified in the graph from 1981 to 2013. The high inflation rate that was experienced in the mid–1980 period has been attributed to the growth in monetary aggregates, which triggered inflation rates in excess of the corresponding targets. Figure 1 shows the relationship between the growth in real GDP and the rate of inflation in Nigeria over

the years, with some periods of high real GDP growth rate associated with periods of high inflation rate, and vice versa. The combined time plot in Figure 1 shows that INFL is almost everywhere above RGDPGR.

Gbadebo and Mohammed (2015) examined the effectiveness of monetary policy as an anti – inflationary measure in Nigeria, using co-integration and error correction approach on quarterly time series data covering 1980 Q1 to 2012 Q4.They found a long run relationship between inflation and the vector of regressors employed. The study also revealed that interest rate, exchange rate, money supply and oil price are the major causes of inflation in Nigeria. Omeke and Ugwuanyi (2010) also carried out a study or better put tested the relationship between money, inflation and output in Nigeria, employing co-integration and Granger-causality test analysis. The findings revealed no existence of a co-integrating vector in the series used. However, Money supply was seen to Granger causes both output and inflation. The result suggest that monetary stability can contribute towards price stability in Nigerian economy since the variation in price level is mainly caused by money supply and also conclude that inflation in Nigeria is too much extent a monetary phenomenon.

Danjuma et al (2012), in their study on the assessment of the effectiveness of monetary policy in combating inflationary pressure on the Nigerian economy, found that liquidity ratio and interest rate are the dominant monetary policy tools that can be employed to combat inflation in Nigeria. Also, Emerenini and Eke(2014) investigated the determinants of inflation in Nigeria using a monthly data from 2007 to 2014, using OLS method found that, exchange rate and money supply influenced inflation. Apir (2015) studied the extent money supply can explain the inflationary phenomenon in Nigeria and discovered that money supply is the main determinant of inflation in Nigeria between 1999 and 2014. Olorunfemi and Adeleke (2013) also examined the effect of money supply on inflation and concluded that money supply and interest rate did influence inflation in Nigeria.

Williams and Adedeji (2004) examined price dynamics in the Dominican Republic by exploring the joint effects of distortions in the money and traded-goods markets on inflation, holding other potential influences constant. The study captured the remarkable macroeconomic stability and growth for period 1991 to 2002. Using a parsimonious and empirically stable error-correction model, the paper found that the major determinants of inflation were changes in monetary aggregates, real output, foreign inflation, and the exchange rate. However, there was an incomplete pass-through of depreciation from the exchange rate to inflation.

Mbongo et al (2014) examined the effects of money supply on inflation in Tanzania. Using OLS, VAR and Error Correction Model, they found that money supply and exchange rate to have a significant impact on inflation in the short and long runs. Mubarik (2005) employed the Granger Causality test to analyse the threshold level of inflation for Pakistan for the period between 1973 and 2000. Annual data set was used. The result of the threshold model suggests that an inflation rate beyond 9-percent is harmful for the economic growth of Pakistan and inflation rate below the estimated level of 9-percent is favourable for the economic growth.

Er, Tugcu and Coban (2014) investigated the short and long-run relationship between savings, inflation and economic growth in Turkey. The Autoregressive Distributed lag (ARDL) Approach was utilized for the analysis. The result showed that savings, inflation and economic growth are co-integrated and either inflation or economic growth has positive impacts on the savings in the Turkish economy.Kisu et al (2012) examined the relative importance of monetary factors in driving inflation in Malawi, using a stylized inflation model specification that included standard monetary variables, the exchange rate and supply side factors. They came up with the finding that money supply growth drives inflation with lags of about 3 to 6 months and that the exchange rate adjustments play a relatively more significant role in feeding cost-push(supply side factors) inflation.Mahmoud (2015) examined the link between consumer price index (CPI) and Gross domestic product (GDP) in Mauritania. The result revealed a positive and significant relationship between the GDP and CPI.

III. Methodology/Data

Data employed for this study are mainly secondary data sourced from the Central Bank of Nigeria (CBN) statistical bulletin 2016 edition. The data set comprises monthly data of the various variables whichcovered the period January, 2009 to December, 2016. The study adopted a multiple regression analysis under the Error Correction Model framework. As is common with most time series studies, estimation process started with the Augmented Dickey-Fuller (ADF) unit root test, then proceeded to estimating the Johansen cointegration test (note: one can only proceed to Johansen cointegration when all the variables in the ADF result are I(1)), and finally to the ECM. Below is the functional form of the model;

INFR= *f*(MS,MPR,EXR,TBR) eqn. (1)

Where; INFR= inflation rate

MS = Broad money supply growth rate

EXR = Exchange rate in terms of dollar price

MPR = Monetary policy rate (interest rate)

TBR = Treasury bills rate

In an explicit form, the above relationship is expressed thus:

$INFL_t = \lambda_o + \lambda_1 MS_t + \lambda_2 EXR_t + \lambda_3 MPR_t + \lambda_4 TBR_t + \mu_t$ eqn. (2)

IV. Discussion of Results

Table 4.1: Summary of Descriptive Statistics/ Normality Test

	EXR	INFR	MPR	MS	TBR
Mean	151.5338	11.36944	9.805694	23.60955	13.38771
Median	154.0113	11.85000	9.518334	19.58367	14.73833
Maximum	161.4000	13.90000	13.99000	37.95685	20.00000
Minimum	121.3633	8.000000	6.130000	18.92846	4.635833
Std. Dev.	8.905161	1.910802	2.392744	6.714215	4.752545
Skewness	-1.749290	-0.609121	0.051642	1.126801	-0.588929
Kurtosis	5.700089	2.111281	1.597435	2.482821	2.019997
Jarque-Bera	58.59162	6.821802	5.933568	16.03859	7.043264
Probability	0.077698	0.083011	0.251469	0.195329	0.129551
Sum	10910.43	818.6000	706.0100	1699.888	963.9150
Sum Sq. Dev.	5630.434	259.2328	406.4910	3200.729	1603.655

Source: Author's Computation using E view 9

Summarized descriptive statistics of inflation rate, real exchange rate, money supply, treasury bill rate and monetary policy rate are reported in the table. Normality test uses the null hypothesis of normality against the alternative hypothesis of non-normality. If the probability value is less than the Jacque Bera chi-square at the 5% level of significance, the null hypothesis of the regression is accepted. Given the results in the Table above, it is apparent that the hypotheses that all the variables are normally distributed and cannot be rejected since all the probabilities are less than the Jarque Bera chi-square distribution. They pass the significance test at the 5 percent level.

The Unit Root Model

An augmented Dickey-Fuller Test (ADF) is a test for unit root in a time series sample. The monthly data for seven years from January 2009 to December 2016 falls within that category. The study adopted the unit root model of Edoumiekumo and Opukiri (2013).

$INFL_t = aINFL_{t-1} + \mu_t$ eqn.(3)

by subtracting INFL t-1 from both sides of equation 3, we have

$\Delta INFL_{t-1} = (a-1)INFL_{t-1} + \mu_{1t}$ eqn.(4)

$MS_t = bMS_{t-1} + \mu_{2t}$

$\Delta MS_{t-1} = (b-1)MS_{t-1} + \mu_{2t}$ eqn.(5)

$EXR_t = cEXR_{t-1} + \mu_{3t}$

$\Delta EXR_{t-1} = (c-1)EXR_{t-1} + \mu_{3t}$ eqn.(6)

$MPR_t = dMPR_{t-1} + \mu_{4t}$

$\Delta MPR_{t-1} = (d-1)MPR_{t-1} + \mu_{4t}$ eqn.(7)

$TBR_t = eTBR_{t-1} + \mu_{5t}$

$\Delta TBR_{t-1} = (e-1)TBR_{t-1} + \mu_{5t}$ eqn.(8)

Where; Δ= difference operator, t-1= number of lag, μ = error term, *a*,*b*,*c*,*d*and *e* = parameters of the explanatory variables.

The result of equations 3 to 8 is presented in table 4.2 below.

Table 4.2: Summary of ADF Unit Root Test

Variables	ADF test Statistics		Mackinnon Critical Value		I (d).	Remark
	@ Level	@ 1st Diff	@ 5 %	10 %	I (d).	Remark
INFL	-1.372370	-8.188406	-2.903566	-2.589227	I (1)	Stationary
MS	-2.412341	-7.038215	-2.903566	-2.589227	I (1)	Stationary
EXR	-2.787250	-8.275540	-2.903566	-2.589227	I (1)	Stationary
MPR	-0.987971	-8.256468	-2.903566	-2.589227	I (1)	Stationary
TBR	-2.157239	-8.188406	-2.903566	-2.589227	I (1)	Stationary
ECT	-3.417393		-2.904198	-2.589562	I (0)	Stationary

Source: Authors' Computation using Eviews9

The table above shows the stationarity of the variables at different levels of differencing. It could be seen that only the error correction term (ECT) is stationary at level, while all the other variables (INFL, MS, EXR, MPR and TBR) are stationary after differencing once. The ECM which is stationary at level is also a proof that there is a long run relationship between the variables. This led us to carry out a cointegration test to know the number of co-integrating equations.

Cointegration Test

Cointegration is a process of combining the degree of non-stationary variables in an equation in such a way that the linear combination (residuals of the equation) is stationary (Oyeniyi, 1998).Where both the dependent and independent variables contains a unit root (non-stationary), but their linear combination is stationary, the variables concerned are said to be co-integrated. Ifthevariables are integrated of order I(1), theJohansen cointegration test will be adopted.Where the result of the cointegration test shows the presence of at least one cointegrating equation, the ECM or VECM will be estimated. However, this paper is tailored toward the ECM technique.

Having established stationarity of the variables, there is the need to determine the existence of a long-run equilibrium relationship among the variables in the model. To realize this, the study employed the Johansen cointegration technique. The cointegration results of the variables are presented in Table 4.3.

Table 4.3: Johansen Cointegration Rank Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.498328	119.1270	69.81889	0.0000
At most 1 *	0.294658	72.90982	47.85613	0.0001
At most 2 *	0.254217	49.52198	29.79707	0.0001
At most 3 *	0.239935	29.86953	15.49471	0.0002
At most 4 *	0.157569	11.48803	3.841466	0.0007

Trace test indicates 5 cointegrating eqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.498328	46.21719	33.87687	0.0011
At most 1	0.294658	23.38784	27.58434	0.1575
At most 2	0.254217	19.65245	21.13162	0.0795

At most 3 *	0.239935	18.38150	14.26460	0.0106
At most 4 *	0.157569	11.48803	3.841466	0.0007

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level
Source: Authors' Computation Using Eviews 9

The result of the Johansen cointegration test (trace statistics) presented above indicates five cointegrating equations and that of the maximum Eigen statistics indicate three cointegrating equations. The result therefore shows the presence of five cointegrating vectors in the model. The cointegrating vectors are INFR, EXR, MPR, MS and TBR. Consequently, we can conclude that there exists a long run relationship between monetary policy instrument variables and inflation rate in Nigeria.

Error Correction Model

The cointegration regression commonly considers the long run property of the model, but when it comes to dealing with short-run dynamics, it does not deal with it explicitly (John, 2015). Hence, the Error Correction Model deals with short run dynamics adjustment of the independent or explanatory variables towards long run equilibrium in each period. Formulating the Error Correction Model (ECM) as follows:

$$\Delta INFR_t = \lambda_0 + \lambda_1\Delta MS_t + \lambda_2\Delta EXR_t + \lambda_3\Delta MPR_t + \lambda_4\Delta TBR_t + \lambda_5\Delta ECT_{t-1} + \mu_t \quad \text{eqn.(9)}$$

Where; ΔECT = change in the one period lagged error correction term; $\lambda_5$measures the speed of adjustment to equilibrium. λ_5 is expected to besignificant and should have a negative sign as itshows the speed of convergence of the model back to its equilibrium point in the event that it drifts away from its equilibrium point. Meaning that, the present value of the dependent variable (inflation rate) adjusts rapidly to changes in the independent variables (MS, EXR, MPR and TBR). A higher percentage of ECT indicates a quick return of the independent variable back to its equilibrium path if any deviation occurs; Δ = difference operator, Tamuno and Edoumiekumo (2012).The ECM as made popular by Granger and Engle is a means of reconciling the short-run behaviour of an economic variable with its long-run behaviour and this corrects for disequilibrium (Gujarati,Porter and Gunasekar, 2009). The result of equation 9 is presented below in Table 4.4.

Table 4.4: Error Correction Mechanism Dependent Variable: D(INFR)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.481668	0.051296	-9.389938	0.0000
D(EXR)	0.299998	0.084937	3.532017	0.0009
D(EXR(-3))	0.147106	0.094991	1.548637	0.1274
D(MPR)	0.537369	0.358960	1.497015	0.1403
D(MPR(-3))	0.899353	0.305085	2.947883	0.0047
D(MPR(-5))	0.514393	0.270084	1.904564	0.0623
D(MS)	0.513120	0.100975	5.081645	0.0000
D(MS(-3))	0.174892	0.119269	1.466365	0.1485
D(MS(-5))	-0.094019	0.051464	-1.826883	0.0734
D(TBR)	-0.248597	0.085664	-2.902017	0.0054
D(TBR(-3))	-0.185389	0.120348	-1.540445	0.1294
D(TBR(-5))	-0.253346	0.105429	-2.403012	0.0198
ECT(-1)	-0.123851	0.032789	-3.777252	0.0004

R^2 = 0.68, Adj. R^2 = 0.61, F-statistic = 9.57. Prob(F-statistic) = 0.00, Durbin-Watson stat = 1.88
Source: Authors' Computation using Eviews 9

The table above captures both the short run and long run impact of selected monetary policy variables on inflation between the period 2009 and 2016. The coefficient of the ECTis negative as expected and it is significant at the 5% level. The coefficient of Error in the table above clearly shows that previous year disequilibrium will be corrected in the present year at a speed of 12%.This implies that the present value of

inflation rate (INFR) adjust slowly to changes in explanatory variables in the model. The coefficient of the adjusted R^2 shows that about 61% of the variation in the general price level can be explained by explanatory variables, while the remaining 41% is captured by the stochastic term. In essence this reveals that the monetary policy variables in the model have been able to influence inflation by 61% within the period covered by this study.

All the variables in the error correction model above have the expected signs both in the short run and the long run. The coefficient of EXR is found to be positive and statistically significant at the 5% level in the short run but it is not significant in the long run as its long run probability value is greater than 0.05. This is a clear indication that any increase in price of dollar will increase the general price of goods and services in Nigeria since the economy is import based. The same is true for MS both in the short-run and long-run. MPR on the other hand is not statistically significant in the short-run but it is significant in the long-run both at the 5% and 10% levels of significance. This goes to show that any increase in MPRwill lead to fall in investment and in turn fall in money supply and subsequently, output falls. As output falls, price of goods and services increases. From the regression result, monetary policy rate also is not statistically significant at 5% level. This reflects the ineffective nature of the monetary policy instrument of interest rate in Nigeria.TBR on the other hand has a negative impact on inflation and is statistically significant at 5% level of significance in the short run and at the 5^{th} lagged period, but was found to be insignificant in the 3^{rd} lagged period.Meaning that, as Treasury bill rate rises, people would prefer to buy bonds than to hold money in cash in anticipation of a future rise in the price of bond. This would result to a reduction in the volume of money in circulation, would translate to fall in price of goods and services. Generally, the result in Table 4.4 reveals thatTBR is an effective tool in controlling inflation both in the short and long run. While EXR and MS are very effective monetary policy tools in the control of inflation in the short run, MPR has not been efficient in the control of inflation in the short run but is efficient in the long run. The Durbin-Watson value of 1.88 is an indication that the estimated model is free from serial or autocorrelation. Also, the Prob(F-statistic) shows that the overall model is statically significant, thus making it fit for policy making.

V. Conclusion and Recommendation

The paper investigated the effectiveness of selected monetary policy tools in the control of inflation in Nigeria using monthly data between January 2009 and December 2016. Data was sourced from Central Bank of Nigeria statistical bulletin. The study estimated the Augmented Dickey-Fuller (ADF) unit root test, Johansen Cointegration test and the Error Correction Model (ECM). Result of the ADF showed that all the variables are integrated of order I(1), except for the Error Correction Term (ECT) which is stationary of order I(0). The Johansen cointegration test result revealed the presence of a long-run relationship between inflation rate and the selected monetary policy variables. The ECM result revealed that the estimated model has a self-equilibrating mechanism of 12%. The paper concludes that Treasury Bill Rate (TBR) is an effective tool in controlling inflation both in the short and long run. While Exchange Rate (EXR) and Money Supply (MS) are very effective monetary policy tools in the control of inflation in the short-run, Monetary Policy Rate (MPR) is effective in the long- run. Therefore, it is recommended that the monetary authority in Nigeria should regulate EXR and MS in controlling inflation to achieve a short-term result, TBR should be used to control inflation both in the short and long-run, while MPR should be used to control inflation for a long-term result.

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