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Impact of Monetary Policy on Inflationary Process in Nigeria

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Abstract
The paper examines the Impact of Monetary Policy on Inflationary Process in Nigeria from 1986 – 2013, using ordinary least squared regression. We started with investigating the stochastic properties of the data using the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests for unit roots. Both tests suggest that all the variables of interest which comprise of inflation rate, Money supply, interest rate and Unemployment are integrated at the second difference. The regression results showed that monetary policy have significant influence on inflation. It is recommended that the government should embark on joint coordination of fiscal and monetary authorities with respect to liquidity flows in the economy to aid curb inflation. Furthermore, where deficit financing is inevitable, it should be put into productive activities in order to create more employment opportunities, raise national output, and increase the living standard of the people.
Keywords: Monetary policy, inflation, money supply, interest rate, unemployment

Introduction

The Central Bank of Nigeria (CBN) since its establishment in 1959 has continued to play the traditional role expected of a Central Bank, which is the regulation of the stock of money in such a way as to promote the social welfare [1]. This role is anchored on the use of monetary policy, aimed towards achievement of full-employment equilibrium, rapid economic growth, price stability, and external balance [1].

Prior to 1986, the economic environment that guided monetary policy was characterized by the dominance of the oil sector, the expanding role of the public sector in the economy and over-dependence on the external sector. In order to maintain price stability and a healthy balance of payments position, monetary management depended on the use of direct monetary instruments such as credit ceilings, selective credit controls, administered interest and exchange rates, as well as the prescription of cash reserve requirements and special deposits. The use of market-based instruments was not feasible at that point because of the underdeveloped nature of the financial markets and the deliberate restraint on interest rates [2].

The most popular instrument of monetary policy was the issuance of credit rationing guidelines, which primarily set the rates of change for the components and aggregate commercial bank loans and advances to the private sector [3]. The sectoral allocation of bank credit in CBN guidelines was ensued to stimulate the productive sectors and thereby stem inflationary pressures. Interest rates were fixed at relatively low levels to promote investment and growth. In the mid-1970s, minimum cash ratios were stimulated on the basis of their total deposit liabilities, but this proved less effective as a restraint on their credit operations because it was lower than the voluntary maintenance by the banks [2].

In general terms, monetary policy involves combination of measures designed to regulate the value, supply and cost of money in an economy, in consonance with the expected level of economic activity. For most economies, the objectives of monetary policy include price stability, maintenance of balance of payments equilibrium, promotion of employment and output growth, and sustainable development [4]. These objectives are necessary for the attainment of internal and external balance, and the promotion of long-run economic growth [5].

The importance of price stability derives from the harmful effects of price volatility, which undermines the ability of policy makers to achieve other laudable macroeconomic objectives [6]. There is indeed a general consensus that domestic price fluctuation undermines the role of money as a store of value, and frustrates investments and growth. Empirical studies [7], [8] on inflation, growth and productivity have confirmed the long-term inverse relationship between inflation and growth.

With the achievement of price stability, the conditions in the financial market and institutions would create a high degree of confidence, such that the financial infrastructure of the economy will be able to meet the requirements of market participants. Indeed, an unstable or crisis-ridden financial sector will render the transmission mechanism of monetary policy less effective, making the achievement and maintenance of strong macroeconomic fundamentals difficult. This is because; it is only in a period of price stability that investors and

consumers can interpret market signals correctly. Typically, in periods of high inflation, the horizon of the investor is very short, and resources are diverted from long-term investments to those with immediate returns and inflation hedges, including real estate and currency speculation [9]. It is on this background that this study would investigate the effectiveness of the monetary policy in Nigeria with special focus on major growth components [10].

In Nigeria, price stability is the major objective of monetary policy. But despite the various monetary regimes that have been adopted by the Central Bank of Nigeria over the years to curb inflation in the country, inflation still remains a major threat to Nigeria's economic growth. The objective of this paper is to estimate the impact of monetary policy on inflation rates in Nigeria. The paper is structure into five sections: introduction, literature review, research methodology, result and discussion and finally the conclusion and recommendations.

Literature Review

Boivin and Giannoni [11] investigated the sources of changes in the effects of monetary policy surprises on the economy. They found that the main source of changes in the effects of policy shocks was changes in the parameters of the policy reaction function rather than in the structural parameters of the economy, providing empirical support for the modeling strategy adopted here.

Busari, Omoke and Adesoye [10] examine the implications of the exchange rate regime on the ability of monetary policy to stabilize the economy particularly in terms of output, prices and interest rate under both a flexible exchange rate regime and fixed exchange rate regime. Using a variant of the Mundell-Fleming model, estimated long run multipliers gave a long run impact of a unit change in money supply on various economic aggregates of interest. They observed that monetary policy stimulates growth better under a flexible exchange rate regime. However, it was observed that rapid depreciation of the exchange rate took place with inflationary consequences.

Chinn and Dooley [12] estimate an interest rate reaction function, using as targets the forecasts of inflation and output gap obtained from a structural VAR of the main economic aggregates that are related to monetary policy, as suggested by [13]. Their findings indicate the relevance of inflation and output stabilization to the BOJ policy. They observe that the inclusion of real exchange rate deviations is not statistically significant to explain the behavior of the interest rate.

Folawewo and Osinubi, [5] examines the efficacy of monetary policy in controlling inflation rate and exchange rate instability. The analysis performed is based on a rational expectation framework that incorporates the fiscal role of exchange rate. Using quarterly data spanning over 1980: 1 to 2000: 4, and applying time series test on the data used, the paper shows that the effort of monetary policy at influencing the finance of government fiscal deficit through the determination of the inflation tax rate affects both the rate of inflation and the real exchange rate, thereby causing volatility in their rates. The paper reveals that inflation affects volatility of its own rate, as well as the rate of real exchange. The policy import of the paper is that monetary policy should be set in such a way that the objective it is to achieve is well defined.

Gupta and Kabundi [14], assess the impact of monetary policy on house price inflation for the nine census divisions of the US economy using a factor-augmented VAR (FAVAR), estimated a large data set comprising of 126 quarterly series over the period 1976:01 to 2005:02. The results based on the impulse response functions indicate that, in general, house price inflation responds negatively to monetary policy shock, but the responses are heterogeneous across the census divisions. In addition, their findings suggest the importance of South Atlantic, East South Central, West South Central, Mountain and the Pacific divisions, in particular, in shaping the dynamics of US house price inflation.

Roberts [15] examines whether changes in monetary policy can account for fall in unemployment and volatility of output and inflation in the United States. The results suggest that changes in the parameters and shock volatility of monetary policy reaction functions can account for most or all of the change in the inflation-unemployment relationship.

The public's demand for money is another fundamental part of the relationship between money growth and inflation. People hold money in order to buy goods and services. As a consequence, firms' and households' demand is for a real quantity of money. If prices increase, then people want to hold more money (Naira) so that the money will buy the same amount. If M is the nominal quantity of money and P is the price level, the real quantity of money is M/P. The price level commonly is measured by general price indexes such as the consumer price index and the gross domestic product deflator. Loosely speaking, the real quantity of money is the nominal quantity of money adjusted for inflation [16].

A proportional relationship between the real quantity of real money demanded and real income is a convenient form of the dependence of demand for money on income. This relationship can be written as:

$M/P = ky$ ……..…1

Where: y is real income and k is the factor of proportionality. The factor of proportionality is not a constant. Most importantly, changes in the opportunity cost of holding money affect the quantity of money demanded. The

opportunity cost of holding money can be summarized by the forgone interest income from holding money instead of other assets. If the opportunity cost of holding money increases, the demand for money decreases; if the opportunity cost of holding money decreases, the demand for money increases. Other factors also can affect the demand for money, such as payments practices and technological innovations in financial intermediation [17].

Research Methodology

Various analytical techniques were employed to test the hypothesis for this study. In order to analyze the relationship between monetary policy and inflation rates in Nigeria, the use of the VAR model is adopted. This is because the relationship between the variables is complex and dynamic, and can only be best estimated by the use of VAR. The Vector Autoregressive model was adopted for this work because it is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system variance. The VAR model sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all endogenous variables in the system. The granger causality test was used to identify and assess the effect and the causal relationship between monetary policy and the level of inflation.

Research Hypotheses

The following hypothesis was tested as a means of carrying out the objectives of the study:

H0: null hypothesis. Monetary policy instruments do not have significant impact on inflation in Nigeria. (Ho: = 0)

H1: Alternative hypothesis. Monetary policy instruments have significant impact on inflation in Nigeria. (H1 ≠ 0)

Model Specification

To determine the extent to which monetary policy instruments influence inflation rate in Nigeria, the VAR model is presented below in the following order:

$OP_t = f(OP_{t-i}, FD_{t-i}, M2_{t-i}, UE_{t-i}, INF_{t-i}, U_{t1})$ ---------- 2

$FD_t = f(FD_{t-i}, OP_{t-i}, M2_{t-i}, UE_{t-i}, INF_{t-i}, U_{t2})$ ---------- 3

$M2_t = f(M2_{t-i}, OP_{t-i}, FD_{t-i}, UE_{t-i}, INF_{t-i}, U_{t3})$ ---------- 4

$UE_t = f(UE_{t-i}, OP_{t-i}, FD_{t-i}, M2_{t-i}, INF_{t-i}, U_{t4})$ ---------- 5

$INF_t = f(INF_{t-i}, OP_{t-i}, FD_{t-i}, M2_{t-i}, UE_{t-i}, U_{t5})$ ---------- 6

Where:

OP_{t-i} = Oil prices at time $_{t-i}$

FD_{t-i} = overall fiscal deficits at time $_{t-i}$

$M2_{t-i}$ = Broad money supply at time $_{t-i}$

UE_{t-i} = Unemployment rate at time $_{t-i}$.

INF_{t-i} = inflation rates at time $_{t-i}$

Ut = is the error term.

(The data was obtained from the Central Bank of Nigeria bulletin of various years).

The structural form is:

$OPt = o + {}_1OP_{t-i} + {}_2FD_{t-i} + {}_3M2_{t-i} + {}_4UE_{t-i} + {}_5INF_{t-i} + U_{t1}$ ---------- 7

$FDt = o + {}_1FD_{t-i} + {}_2OP_{t-i} + {}_3M2_{t-i} + {}_4UE_{t-i} + {}_5INF_{t-i} + U_{t2}$ ---------- 8

$M2t = o + {}_1M2_{t-i} + {}_2OP_{t-i} + {}_3FD_{t-i} + {}_4UE_{t-i} + {}_5INF_{t-i} + U_{t3}$ ---------- 9

$UEt = o + {}_1UE_{t-i} + {}_2OP_{t-i} + {}_3FD_{t-i} + {}_4M2_{t-i} + {}_5INF_{t-i} + U_{t4}$ ---------- 10

$INF_t = x_O + x_1INF_{t-I} + x_2OP_{t-I} + x_3FD_{t-i} + x_4M2_{t-i} + x_5UE_{t-i} + U_{t5}$ ---------- -11

A priori expectations

In economic theory, there exists positive or negative relationship between the dependent and independent variables. Thus, the outcome of the tests run and their subsequent interpretations will determine the category each variable falls under.

Results and Discussion

The study carried out stationary test of all the variables in order to avoid nonsense result by the used of Augmented Dickey Fuller (ADF) and the Phillips-Peron (PP) test. The ADF test revealed that inflation rate, broad money supply, fiscal deficit, unemployment rate and oil prices in Nigeria during the periods of 1986 to 2013 are non-stationary at levels while the PP test on the other hand showed that all the variables are also non-stationary at levels except M2.

The test was conducted again and at the first difference, The ADF test revealed that all the variables remained Non Stationary except inflation .The PP again recorded non-stationarity in fiscal deficit and money supply and stationarity in oil prices, unemployment and inflation. Since the variables have not attained

stationarity at this level, the test was conducted again and the variables were tested at the second difference.

The ADF test at the second difference showed that oil prices, fiscal deficit, unemployment and Inflation rate in Nigeria during the periods of 1986 to 2013 are stationary except broad money supply as seen in Table 1. The PP test on the other hand at the second difference indicated that all the variables that is, oil prices, fiscal deficit, unemployment, broad money supply and inflation rate in Nigeria during the periods of 1986 to 2013 are stationary. This was possible by comparing the ADF and PP statistical values in absolute terms with the McKinnon critical values at 1%, 5% and 10%. With all series are in I (1), with this, we proceeded to co-integration test.

Table 1: ADF Unit Root Stationary Test At Levels

Variables	ADF statistic	1% critical values	5% Critical Values	10% critical values	Remark
OP	-0.1492	-3.7497	-2.9969	-2.6381	Non stationary
FD	-0.1864	-3.7497	-2.9969	-2.6381	Non stationary
UE	-1.6994	-3.7497	-2.9969	-2.6381	Non stationary
M2	2.1201	-3.7497	-2.9969	-2.6381	Non stationary
INF	-2.8164s	-3.7497	-2.9969	-2.6381	Non stationary

Source: E-views 4.0

Table 2: ADF Unit Root Stationary Test At First Difference

Variables	ADF statistic	1% Critical Values	5% Critical Values	10% Critical values	Remark
OP	-2.5722	-3.7667	-3.0038	-2.6417	Non Stationary
FD	-1.5510	-3.7667	-3.0038	-2.6417	Non Stationary
UE	-3.2059	-3.7667	-3.0038	-2.6417	Non Stationary
M2	-0.6026	-3.7667	-3.0038	-2.6417	Non Stationary
INF	-5.8042	-3.7667	-3.0038	-2.6417	Stationary

Source: E-views 4.0

Table 3: ADF Unit Root Stationary Test At Second Difference

Variables	ADF statistic	1% Critical Values	5% Critical Values	10% Critical values	Remark
OP	-4.0266	-3.7856	-3.0114	-2.6457	Stationary
FD	-3.7669	-3.7856	-3.0114	-2.6457	Stationary
UE	-6.7510	-3.7856	-3.0114	-2.6457	Stationary
M2	-2.7446	-3.7856	-3.0114	-2.6457	Non Stationary
INF	-7.0235	-3.7856	-3.0114	-2.6457	Stationary

Source: E-views 4.0

Table 4: PP Unit Root Stationary Test At Levels

Variables	PP statistic	1% critical values	5% critical values	10% Critical Values	Remarks
OP	0.3617	-3.7343	-2.9907	-2.6348	Non stationary
FD	0.4304	-3.7343	-2.9907	-2.6348	Non stationary
UE	-2.3816	-3.7343	-2.9907	-2.6348	Non stationary
M2	6.4358	-3.7343	-2.9907	-2.6348	Stationary
INF	-2.4716	-3.7343	-2.9907	-2.6348	Non stationary

Source: E-views 4.0

Table 5: PP Unit Root Stationary Test At First Difference

Variables	PP statistic	1% critical values	5% critical values	10% critical values	Remarks
OP	-6.0973	-3.7497	-2.9969	-2.6381	Stationary
FD	-3.6910	-3.7497	-2.9969	-2.6381	Non Stationary
UE	-7.1564	-3.7497	-2.9969	-2.6381	Stationary
M2	-1.1641	-3.7497	-2.9969	-2.6381	Non Stationary
INF	-4.5320	-3.7497	-2.9969	-2.6381	Stationary

Source: E-views 4.0

Table 6: PP Unit Root Stationary Test At Second Difference

Variables	PP statistic	1% critical values	5% critical values	10% critical values	Remarks
OP	-10.7082	-3.7667	-3.0038	-2.6417	Stationary
FD	-8.3339	-3.7667	-3.0038	-2.6417	Stationary
UE	-19.2272	-3.7667	-3.0038	-2.6417	Stationary
M2	-6.9617	-3.7667	-3.0038	-2.6417	Stationary
INF	-7.0375	-3.7667	-3.0038	-2.6417	Stationary

Source: E-views 4.0

Co integration Test Results

To have confirmed the stationarity of the variables at I (1), we proceeded to examine the presence or non-presence of cointegration among the variables. That is, to determine whether there is a long run equilibrium relationship among the variables. We started the cointegration analysis by employing the Johansen cointegration test as show in tables 7 and 8.

The first column is the number of co integrating relations under the null hypothesis from r=0 to r= k-1. Since we have 5 variables, we have from none to at most 4, where k is the number of endogenous variables. The second column is the ordered Eigen value, the third is the trace statistics and Max Eigen statistics respectively for the two tables and the last two columns are the 5% and 1% critical values. A close look at both statistics show that when r=0, Trace statistics and Max Eigen statistics was higher than both 5% and 1% critical values with values 90.80 and 40.94 respectively unlike the rest where the reverse is the case.

Hence, the trace and maximum eigenvalue statistics show that the null-hypothesis of no-cointegrating is rejected at both 1% and 5% levels of significance. The trace test statistics suggests two co integrating equation at 5% and one cointegrating equation at 1% while the Maximum Eigen statistics suggests one co integrating equations at both 1% and 5% level. Thus , since there is an indication of at least two to three co integrating equations out of the five being considered, the conclusion drawn from this result is that it is cointegrated that is, there exists a long-run relationship between money supply and inflation rate and other variables in the model.

Table 7: Cointegration Trace Statistics

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.831360	90.80757	68.52	76.07
At most 1 *	0.675800	49.86783	47.21	54.46
At most 2	0.357472	23.96077	29.68	35.65
At most 3	0.294449	13.78684	15.41	20.04
At most 4 *	0.221706	5.764974	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Trace test indicates 2 cointegrating equation(s) at the 5% level
Trace test indicates 1 cointegrating equation (s) at the 1% level
Source: E- views 4.0

Table 8: Cointegration Maximum Eigen Statistics

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.831360	40.93974	33.46	38.77
At most 1	0.675800	25.90706	27.07	32.24
At most 2	0.357472	10.17393	20.97	25.52
At most 3	0.294449	8.021868	14.07	18.63
At most 4 *	0.221706	5.764974	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level
Max-eigenvalue test indicates 1 cointegrating equation(s) at both 5% and 1% levels
Source: E- views 4.0

Vector Error Correction Results

In order to gain possession of both the short run and long run relationship that exist among the variables after confirming the existence of cointegration, we moved further to investigate the dynamic relationship among the variables by specifying the error correction model. The result of the estimation is presented in table 9.

Table 9: Error Correction Results of ΔINF

Regressor	Coefficient	T-Values
INTERCEPT	8.175	1.656
D(OP(-1))	0.119	0.201
D(FD(-1))	-22.018	-0.58
D(M2(-1))	-1.052	-0.78
D(UE(-1))	-16.467	-1.53
D(INF(-1))	0.072	0.431
ECM(-1)	-0.142	-1.06

Source: E- views 4.0

R-SQUARE= -0.281 S.E.= 11.395 F-STAT= 1.043

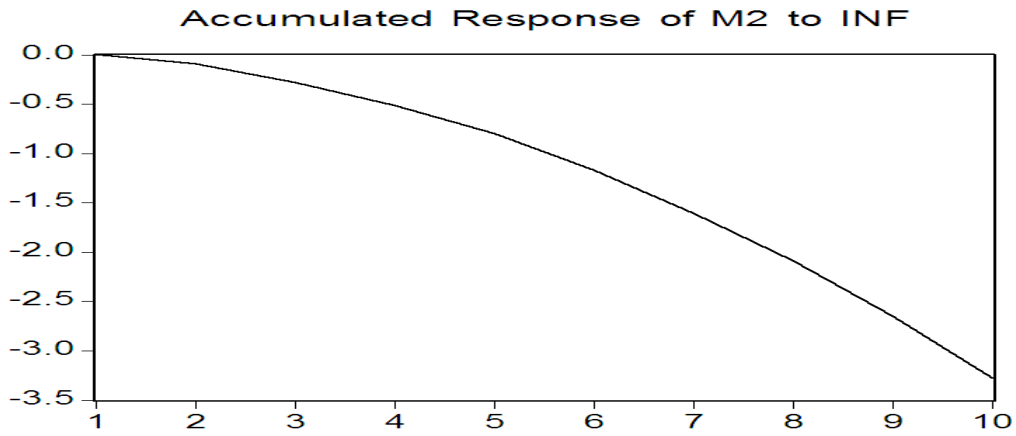
The estimation suggests that the speed of adjustment (the error correction mechanism) to the long run equilibrium is negative because only about -0.14 percent of the disequilibrium error which occurred in the previous period is corrected in the current period. The results also indicate that, the past change in fiscal deficit, unemployment and money supply is negative and insignificant to current changes in the inflation rate. This is not in line with the a priori expectation. This is because in the short run, an increase in money supply and fiscal deficits in the last period is supposed to be followed by increase in inflation rate in the current period. However, this may be due to the nature of the data.

Furthermore, the past changes in oil prices and inflation are positive, although almost insignificant as oil prices is 0.12 while inflation is 0.07, which means that Inflation rate in the current period is expected to rise slightly as past inflation and oil prices increase in the short run in the last period .

Impulse Response Function Analysis

The impulse response functions were also used to interpret functions the estimated effects of innovations in monetary policy variables on inflation rate. The interpretation follows from the path of the impulse response generated from the vector error correction estimated residuals. The impulse responses show the path of inflation rate when there are innovations in the policy variables. Figure 1 show the Accumulated response of M2 to Inflation in the period under review that is, 1986 to 2013.

FIGURE 1: Accumulated Response of M2 to Inflation



Source: E- views 4.0

The response figure indicates that, the response of inflation to money supply is negative. A close look at the graph shows a negative movement from period 1 to 2, the next movement which was from period 2 to 3 was almost not visible, Subsequent movements from period 4 down to 10 resulted in a downward movement of the graph right up to period 10, indicating a negative relationship. This is rather contrary to the Quantity Theory of Money which states that an increase in the money in circulation in the economy leads to an increase in the rate of inflation of that economy.

This contrast may however be due to the nature of the data or errors and inaccuracies in the compilation of the data. Again, Money supply comprises of different inputs such as currency in circulation, currency held by commercial banks and merchant banks, private sector demand deposit at CBN, private sector demand deposit at commercial banks and so on. Thus, the result may not really meet our expectation because the data used is all encompassing.

Furthermore, the response of inflation and fiscal deficit to inflation rate is interesting. There was an upward movement in inflation graph to the second level, this slowed down from level 2 to 3 and picked up

steadily upward from period 4 to 10 showing that the response of inflation to inflation is positive. The movement of fiscal deficit is similar to that of inflation as its response to inflation is also positive. Thus, an indication that a shock in the variable, inflation and fiscal deficit results in an increase in inflation rate as expected.

Conclusion and Recommendations

We analyzed the impact of monetary policy on inflationary process in Nigeria from 1986 to 2013. The result shows that monetary policy has significant impact on inflationary process in Nigeria during the review period. Furthermore, the Nigerian experience has also shown that the impact of monetary policy on inflation will yield better results when its complemented to some extent by other economic policies such as fiscal policy in pursuance of one cause, 'curbing inflation'. It is recommended that the government should embark on joint coordination of fiscal and monetary authorities with respect to liquidity flows in the economy to aid curb inflation. Furthermore, where deficit financing is inevitable, it should be put into productive activities in order to create more employment opportunities, raise national output, and increase the living standard of the people.

Reference

1] Ajayi M., (2002): "Monetary Transmission Mechanism in Nigeria", CBN Economic and financial Review,45.
2] Chimobi and Igwe (2010): "Budget Deficit, Money Supply and Inflation in Nigeria". European Journal of Economics, Finance and Administrative Sciences ISSN 1450-2275 Issue 19 (2010)
3] Omotor D. G. (2007): "Monetary Policy and Economic Growth": Theoretical and Conceptual Issues, *CBN Economic and Financial Review* 45.
4] Abedi A. (1997): "The Effects of Money Growth on Inflation and Interest Rates across Spectral Frequency Bands". *Journal of Money, Credit and Banking*, Vol. 26.
5] Folawewo A. O and T.S Osinubi (2006): "Monetary Policy and Macroeconomic Instability in Nigeria": A Rational Expectation Approach
6] Batini N., (2004), "Achieving and Maintaining Price Stability in Nigeria," *IMF Working Paper* WP/04/97, June
7] Ajayi S.I. and O.O Ojo, (1981): "Money and Banking". London: George Allen and Unwin
8] Fischer S. (1994):"Recent Developments in Macroeconomics." The Economic Journal 98
9] Bernanke B., and F. Mishkin (1997): "Inflation targeting: A new Framework for Monetary Policy", Journal of Economic Perspectives 11(2)
10] Busari, Omoke and Adesoye (2001): "Monetary Policy and Macroeconomic Stabilization under Alternative Exchange Rate Regime": Evidence from Nigeria.
11] Boivin J., and M. Giannoni, (2003): "Has Monetary Policy Become More Effective?"NBER Working Paper no. 9459 (January).
12] Chinn M.D., M.P.Dooley, (1997): "Monetary Policy in Japan, Germany and the United States: does one size fit all?" NBER Working Paper No. 6092, Cambridge, MA, USA.
13] Friedman M. (1994): "Monetary Policy," Abstract.". *International Encyclopedia of the Social & Behavioral Sciences*
14] Gupta and Kabundi, (2006): "The effect of monetary policy on House price inflation": a factor Augmented Vector Auto-regression (favar) approach
15] Roberts (2004), "Monetary Policy and Inflation Dynamics" Finance and Economics Discussion Series Divisions of Research & Statistics and Monetary Affairs Federal Reserve Board, Washington, D.C.
16] Mankiw N. (2000): "Macroeconomics" Macmillan worth publishers
17] Nordhaus (2004): "*Aggregate Money Demand Functions.* Boston": Kluwer Academic Publishers.