

Monetary Policy Innovations and Growth Rate of Output in Nigeria

¹Prof. Chinwuba Okafor ²Akhor Sadiq Oshoke, ³Akwaden Stephen Thomas

¹Department of Accounting,
Faculty of Management Sciences,
University of Benin,
Benin City, Edo State,
Nigeria

²Department of Accounting
School of Business Studies,
Edo State Polytechnic, Usen.
P.M.B.1104, Benin City, Edo State,
Nigeria.

E-mail: sadiqjabas@gmail.com

³Nasarawa State University,
Lafia. Nasarawa State, Nigeria.
E-mail: akwastom@gmail.com

ABSTRACT

The study examined the impact of monetary policy innovations on growth rate of output in Nigeria. This study utilized times series data within the period of 1985 to 2012 which was sourced from the statistical bulletin of Central Bank of Nigeria, Nigerian Investment Promotion Commission (NIPC) and Securities and Exchange Commission (SEC). The study employed Vector Autoregressive (VAR) estimation technique in the analysis of data. The result showed that money supply exerts significant influence on growth of output in Nigeria while exchange rate and interest rate were insignificant. The study recommended that exchange rate and interest rate should be regulated. It also suggested the need for monetary authorities to implement policy that effectively enhanced money supply.

Keywords: Monetary policy, Money Supply, Exchange rate, Interest rate, Growth rate of output

INTRODUCTION

Background to the Study

The monetary policy is essential to achieve desired objectives which traditionally include promoting economic growth, achieving full employment level, reduction in the level of inflation, maintenance of healthy balance of payment, sustenance of growth in the economy, increase in industrialization and economic stability. Fiscal policy is central to the health of any economy, as government's power to tax and to spend affects the disposable income of citizens and corporations, as well as the general business environment. Monetary policy as a 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 (Folawewo and Osinubi, 2006). The objectives of monetary policy include price stability, maintenance of balance of payments

equilibrium, promotion of employment and output growth, and sustainable development. These objectives are necessary for the attainment of internal and external balance, and the promotion of long-run economic growth.

Monetary Policy is essentially the tool for executing the mandate of monetary and price stability. Monetary policy is essentially a programme of action undertaken by the monetary authorities' e.g the central bank, to control and regulate the supply of money in the public and the flow of credit with a view to achieving predetermined macroeconomic goals (Dwivedi, 2005). The performance of monetary policy has improved greatly in recent times- inflation has remained at moderate levels accompanied by high growth of domestic output. To sustain the efforts, there is need for appropriate collaboration with the fiscal authorities as well as the development of confidence in inter-bank market and the necessary financial market infrastructure is still relevant.

Fiscal and monetary policies are the tools through which an economy is regulated by the government or the respective central bank. The objectives of monetary and fiscal policies in Nigeria are wide-ranging. These include increase in Gross Domestic Product (GDP) growth rate, reduction in the rates of inflation and unemployment, improvement in the balance of payments, accumulation of financial savings and external reserves as well as stability in Naira exchange rate (CBN, 2009). Therefore, monetary policy is essential to achieve desired objectives which traditionally include promoting economic growth, achieving full employment level, reduction in the level of inflation, maintenance of healthy balance of payment, sustenance of growth in the economy, increase in industrialization and economic stability.

Omoke and Ugwuanyi (2010) examined the causality between money, price and output in Nigeria. They employed co-integration and granger-causality test analysis for the empirical analyses. They found out that there is no existence of a co-integrating vector in the series used. Therefore, money supply was seen to Granger cause both output and inflation. That means that money supply, output and inflation are moving in the same direction. The findings also suggest that monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply and they conclude that inflation in Nigeria is to an extent a monetary phenomenon.

Paddy (1992) contended that macroeconomic environment is one of the building blocks which determine the success of the stock market in ensuring efficiency in the transmission of capital from deficit to surplus sector of the economy. A conducive macroeconomic environment promotes the profitability of business which propels them to a stage where they can access securities for sustained growth. In addition, the barometers for measuring the performance of the macro-economy include real GDP growth rate, rate of inflation, the exchange rate, fiscal position and the debt position.

Statement of the Problem

Monetary policy implementation in a developing country like Nigeria faces additional challenges that are not present in developed economies; such has fiscal dominance and the treat of currency substitution. Therefore the inability of monetary policies to effectively maximize its policy objective most times is as a result of the shortcomings of the policy instruments used in Nigeria as such limits its contribution to growth even though monetary policies had brought impressive contribution over the years. Based on the frequently changing business environment, fiscal, monetary and other macro-economic policies, Nigeria has not been able to harness her economic potentials for rapid economic development (Ogbole, 2010).

Monetary and fiscal policies accorded prominent roles in the pursuit of macroeconomic stabilization in emerging countries like Nigeria. There has been a serious debate between the Keynesians and the monetarists. The monetarists believe that monetary policy exert greater impact on economic activity while the Keynesian believe that fiscal policy rather than the monetary policy exert greater influence on economic activity. Despite their demonstrated efficacy in other economies as policies that exert influence on economic activities, both policies have not been sufficiently or adequately used in Nigeria (Ajisafe and Folorunsho, 2002). The challenges of monetary policy management rest wholly on monetary authorities which have over the years been committed to its effective control. The performance of monetary policy has improved greatly, in recent times- inflation has remained at moderate levels accompanied by high growth of domestic output. Emanating from the above, the research questions for this study are therefore;

1. To what extent does money supply affects the growth rate of output in Nigeria?
2. To what extent does exchange rate affects the growth rate of output in Nigeria?
3. Does interest rate affect the growth rate of output in Nigeria?

Objectives of the Study

The broad objective of this study is to investigate monetary policy innovation and growth rate of output in Nigeria. Therefore, the specific objectives are to:

1. ascertain the impact of money supply on the growth rate of output in Nigeria;
2. evaluate the impact of exchange rate on the growth rate of output in Nigeria; and
3. determine the impact of interest rate on the growth rate of output in Nigeria.

Research Hypotheses

The following null hypotheses are formulated to be tested:

- HO₁: There is no significant relationship between money supply and growth rate of output in Nigeria.
- HO₂: There is no significant relationship between exchange rate and growth rate of output in Nigeria.
- HO₃: There is no significant relationship between interest rate and growth rate of output in Nigeria.

Scope of the Study

This study utilized time series data to examine monetary policy innovations and growth rate of output in Nigeria within the period of 1985 to 2012. The major sources of these data are the statistical bulletin of Central Bank of Nigeria, Nigerian Investment Promotion Commission (NIPC), Securities and Exchange Commission (SEC), and Federal Ministry of Finance, Bureau for Public Enterprises (BPE), World Bank Reports, Seminar Papers, Journals, and other Periodicals.

LITERATURE REVIEW

Conceptual Framework

Monetary policy plays an important role in boosting the economic growth of any country where money is exogenously determined in the economy (Abbas and Husain, 2006). Monetary policy is concerned with discretionary control of money supply by the monetary authorities (Central Bank with Central Government) in order to achieve stated or desired economic goals. Governments try to control the money supply because most governments believe that its rate of growth has an effect on the rate of inflation (Dwivedi, 2005). Exchange rate is the most important factor that influences monetary policy measure in Nigeria. This therefore means that monetary policy will be more effective if the inherent differences in these sectors are factors in the design of policies in Nigeria. Mishra and Pradhan (2008) opine that monetary policy is essential to achieve desired objectives which traditionally include promoting economic growth such as achieving full employment level, reduction in the level of inflation, maintenance of healthy balance of payment, sustenance of growth in the economy, increase in industrialization and economic stability.

Fiscal policy as one of the most important tools have significant effect on all economic sectors and have real effect on economic variables include Gross national product, inflation, unemployment and so on. Credit flows and the fiscal stance are found to play a significant role in determining the trade balance. Meanwhile, fiscal policy is generally believed to be associated with growth and that appropriate fiscal measures in a particular circumstances can be used to stimulate economic growth and development (Khosravi and Karimi, 2010). Nigerian government has gradually expanded its controls over the private sector, levying differential taxes and subsidies, increasing industrial prices relative to farm prices, favoring investment in key sectors, providing tariff and tax incentives to vital sectors, protecting favored industrial establishments from foreign competition, awarding import licenses to selected firms and industries, and providing foreign exchange to priority enterprises at below-market exchange rates in order to bring about economic growth and development.

Ajisafe and Folorunso (2002) investigate the significant impact of monetary and fiscal policy on economy activity using a time series data covering the period 1970 to 1998. They found out that monetary rather than fiscal policy has impact significant on economic activity in Nigeria. This means that more emphasis should be placed on fiscal action by the government which has led to greater distortion in the Nigerian economy. Balogun (2007) employed simultaneous equation models to the relationship between monetary policy ineffectiveness and economic growth. He finds that ineffectiveness monetary policy ineffectiveness in Nigeria brings about a decline in economic growth. He also found similar evidence in Gambia, Guinea, Ghana and Sierra Leone using the same models.

Empirical Review

Saibu and Nwosu (2011) examine the effect of monetary policy on sectoral output growth in Nigeria within a period 1986 to 2008. They employed Auto Regressive Distributed Lag (ARDL) model in the data analysis. They observed that that manufacturing sector is not sensitive to any of the monetary policy variables. This implies that interest rate and exchange rate does not really influence output growth among manufacturing sector of the economy. Meanwhile, in agricultural sector, exchange rate influences output growth in Nigeria. In addition, interest rate and exchange rate are the main determinants of mining output growth while building/construction sector is more responsive to changes in exchange rate and bank credit.

Rodriguez and Diaz (1995) examined output growth, real wage growth, exchange rate depreciation, inflation, monetary growth, and the Solow residuals applied in decomposing the movements of Peruvian output. They observed that output growth could be affected by shocks as well as exchange rate.

Adesoye (2012) examined the co-integration and causality between price, monetary aggregate and real output in Nigeria within the period of 1970 to 2009 using the inflationary gap model based on the quantity theory of money. The unit root test showed that money and price gaps are stationary at level, while real output is found stationary at first difference. The Johansen co-integration test revealed presence of one co-integrating vector and causality is found to significantly run from money supply to price. The impulse response function analysis indicated that price is more responsive to one squared variance of its own shocks, monetary and output shocks as the horizon prolonged.

Rogers and Wang (1995) conducted a study on output, government spending, inflation, the real exchange rate, and money growth in Mexico using VAR model for the data analysis. They found out that exchange rate depreciations will lead to a decrease in output.

Omoke and Ugwuanyi (2010) investigated the long-run relationship between money, price and output in Nigeria. Their empirical finding suggests that no con-integrating vector exist between the variables and also found that money supply granger causes both output and inflation suggesting that monetary stability can contribute towards price stability.

Chimobi and Uche (2010) examined the relationship between Money, Inflation and Output in Nigeria. The co-integrating result revealed that the variables used in the model exhibited no long run relationship among each other. The result of the study suggested that monetary stability can contribute towards price stability in the Nigerian economy since the variation in price level is mainly caused by money supply and concluded that inflation in Nigeria is to an extent a monetary phenomenon.

Ahmed, Asad, and Hussain (2013) examined the fundamental relationship between money supply, prices and income in Pakistan. The study employed a time series data of real gross domestic product (GDP), nominal GDP, prices and money supply for the period of 1973 to 2007. The stationary properties of the data series were investigated with the help of ADF test and series were found integrated of the order zero. They found out that a significant relationship exists between the growth of money supply and inflation.

Adefeso and Mobolaji (2010) investigated the effectiveness of fiscal and monetary policy on economic growth in Nigeria. The empirical result showed that the effect of monetary policy is stronger than fiscal policy and the exclusion of the degree of openness did not weak this conclusion. Abdul-Majid, (2007) examined the relationship between money, inflation and real output in Indonesia, Pakistan and Malaysia. They employed vector autoregressive (VAR), Johansen co-integration method and Granger-Causality test for the empirical analysis. They also employed the impulse response function to determine the response of price gap on Cholesky one standard innovation of inflation, money and real output shocks in Nigeria. Their study revealed that money supply is a lead indicator of inflationary pressure.

Onyeiwu (2012) examines the impact of monetary policy on the Nigerian economy by employing an Ordinary Least Squares Method (OLS) to analyses the secondary data collected between 1981 and 2008. The empirical finding revealed that monetary policy measured by money supply has a significant positive impact on GDP growth rate of output.

Ogunmuyiwa and Ekone (2010) investigated the significant impact of money supply on economic growth in Nigeria between 1980 to 2006. The study employed ordinary least square

equation, causality, and error correction model for the empirical analyses. They found out that money supply has positive and a significant impact on economic growth but the result is however insignificant in the case of GDP growth rates on the choice between contractionary and expansionary money supply. This in conclusion means that the increase in money supply will lead to a significant increase in economic growth.

Osiogbu and Onuorah (2012) posit that exchange rate plays a key role in international economic transactions because no nation can remain in isolation due to varying factor endowment. Movements in the exchange rate have ripple effects on other economic variables such as interest rate, inflation rate, import, export, output, etc. These facts underscore the importance of exchange rate to the economic well-being of every country that opens its doors to international trade in goods and services. Rodric (2006) investigated the relationship between exchange rates and economic growth in Kenya. The study revealed that exchange rates have no significant relationship on economic growth. They are however indirectly linked through several channels, including money, imports, agricultural production and foreign aid. Based on the literature review, we expect a mixed relationship between exchange rate and economic growth.

Eze and Okpala (2014) conducted a study on the quantitative analysis of the impact of exchange rate policies on Nigeria's economic growth. The study employed Chow test to determine the structural stability of the relationship between exchange rate and output of goods and services during the two regimes and Augmented Dickey-Fuller unit root tests and Johansson co integrating tests was also conducted in study to test the stationary of the variables and the order of integration. They found out that exchange rate and money supply had a significant impact on Nigeria's economic growth performance. This in other words means that exchange rate and money supply are a major determinant of output growth rate in Nigeria. Chow test showed that the relationship between exchange rate and economic growth performance in Nigeria have not undergone any significant structural changes.

Emeh and Johnson (2010) examined the possible direct and indirect relationships between exchange rate and GDP growth. The study adopted a simultaneous equation model and a generalized method of moment (GMM) technique for the empirical analysis. The empirical results revealed that there is no strong direct relationship between changes in exchange rate and output growth. This in other words means that changes in exchange rate had no significant increase in output growth rate in Nigeria.

Nicholas (2010) examined the dynamic relationship between interest rate reforms; bank based financial development and economic growth in South Africa using co-integration and Error correction models. The empirical findings revealed that interest rate reforms have a strong positive impact on financial development. The study also showed that interest rate reforms do not Granger cause investment and economic growth. In addition, interest rate policy is among the emerging issues in current economic policy in Nigeria in view of the role it is expected to play in the deregulated economy in inducing savings which can be channeled to investment and thereby increasing employment, output and efficient financial resource utilization (Rodric, (2006)).

Obamuyi (2009) investigated the relationship between interest rate and economic growth in Nigeria using time series data covering 1970-2006. The study applied co-integration and error correction model to capture both the long run and short run dynamics of variables in the model. The result showed that real lending rates have significant effect on economic growth. Based on the literature review, we expect a positive relationship between interest rate and economic growth.

Bilquees, Mukhtar, and Sohail (2012) investigate the dynamic interactions among macroeconomic variables in Pakistan for the period 1972Q1 to 2009Q4. The study employed a Johansen multivariate cointegration technique, Granger causality test and variance decomposition. The empirical results revealed that existence of co-integration, the causality test supports the non-neutrality of money view of the Keynesians and the monetarists at least in the short-run. The findings also showed that a bi-directional causality between money supply and price level, and interest rate and price level.

Theoretical Framework

The monetary theory of price stability stresses that price stability therefore encompasses all main areas in macroeconomic environment of a given country. Monetary policy and macroeconomic events have a large influence on the unpredictability of the stock price, which further implies that macroeconomic variables could exert shocks on share returns and thereafter influence investors' investment decision (Christopher (2006).

Monetary and fiscal policies are both commonly accorded prominent roles in the pursuit of macroeconomic stabilization in developing countries, but the relative importance of these policies has been a serious debate between the Keynesians and the monetarists. The monetarists believe that monetary policy exert greater impact on economic activity while the Keynesian believe that fiscal policy rather than the monetary policy exert greater influence on economic activity. A basic premise of Keynesian economics is that the private sector is inherently unstable (Emeh and Johnson (2010).

The quantity theory of money developed by Kaldor in 1982 assumes that in the long run the quantity of money and the general price level bear a proportional relationship, with money as the cause and the price level as the effect. The quantity theory of money equation in its standard modern form is: $MV = PY$, which can be re-written as $M/P = Y/V$.

It is not essential to the Quantity Theory that the ratio Y/V remain constant, in either the short run or the long run. Quantity theorists can live quite happily with both secular trends and some degree of cyclical variation in both V and Y : a *ceteris paribus* clause can be written into the proposition regarding the proportionality of M and P . But two points are essential to the theory. First, if this *ceteris paribus* clause is to have any validity, significant variations in V and Y must stem from sources independent of the quantity of money; any dependence must be minor and transient. Second, significant variations in the quantity of money itself must stem from an independent source, or in other words money must be exogenous. That is, there must be two-way independence of the sources of variation in M on the one hand and V and Y on the other.

Modern monetary theory also known as neochartalism, is an economic theory that deals with the procedures and consequences of using government-issued tokens as the unit of money, i.e., fiat money. According to modern monetary theory, "governments with the power to issue their own currency are always solvent, and can afford to buy anything for sale in their domestic unit of account even though they may face inflationary and political constraints"(Keynes,1936).

On the contrary, the government receives more taxes on a particular day than it spends. In this case, there may be a system-wide deficit of reserves. As a result, surplus funds will be in demand on the interbank market, and thus the short-term interest rate will rise towards the discount rate. Thus, if the central bank wants to maintain a target interest rate somewhere between the support rate and the discount rate, it must manage the liquidity in the system to ensure that there is the correct amount of reserves in the banking system.

METHODOLOGY

Model Specification

To observe the effects of monetary policy innovations in Nigeria, we adopt the Vector Auto regression (VAR) approach with a recursively-orthogonalized identifying restriction to take care of the underlying assumptions made. We adopted the approach modified by Starr (2005). We estimate a reduced form VAR and identify monetary-policy innovations through specification about variable ordering. Specifically, the reduced form VAR is thus:

$$Y_t = B_0 + B_1 Y_{t-1} + \dots + B_k Y_{t-k} + \mu_t$$

Where Y_t is a vector of our policy and non-policy variables, B_0 is a vector of constants, B_{t-1} is a matrix of coefficients on the variables lagged/periods, μ_t is a vector of serially uncorrelated disturbances that have zero mean and variance co-variance matrix $\sum \mu^2$ and k is the number of lags. We make the usual assumption that the Central Bank cannot respond instantaneously to developments in the real economy. This assumption imposes a recursive restriction on the reduced form disturbance. This restriction helps to identify and interpret the relationship between the residuals of the VAR model and the underlying innovations in monetary policy variables. It is only when the innovations have been correctly identified that the estimated VAR can be used to generate impulse response functions that describe the time-dynamic effects of monetary innovations on the non-policy variables. This process is usually referred to as the Choleski decomposition.

The General basic model of VAR (p) has the following form:

$$GRPUT_t = \alpha_i + \sum_{t=1}^k \beta_i M_t^2 + \sum_{t=1}^k \lambda_i EXR_t + \sum_{t=1}^k \theta_i INR_t + \mu_i \dots \dots \dots 1$$

where;

$GRPUT_t$ = represents current growth rate of output which is measured by gross Domestic Product (GDP) for the period.

M_t^2 = represents current level of money supply which is measured by summation of import and export divide by two. $M^2 = (X+M)/2$.

EXR_t = current level of exchange rate

INR_t = current level of interest rate

α_i = intercept

β_1 = coefficient of money supply

λ_i = coefficient of exchange rate

θ_i = coefficient of interest rate

μ_i = stochastic error term.

The VAR model depicting simultaneous relationships between money supply, exchange rate, interest rate and growth rate of output in Nigeria as specified above.

Methods of Data Analysis

The Pearson correlation coefficient of the variables was used to test for the presence of multicollinearity among the explanatory variables. A Unit Root Test was employed 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. The Augmented Dickey-Fuller unit root test is employed as a prior diagnostic test before the estimation of the Vector Autoregressive (VAR) model to examine the stochastic time series process properties of monetary innovation and growth rate of output in Nigeria. In conducting all our data analysis, we use both Microsoft Excel and EViews 8.0 software packages.

DATA ANALYSIS

Correlation Matrix

Table 4.2, shows the relationship that exist among the variables used in this study. The correlation coefficient shows that exchange rate (0.83) had strong positive relationship with growth rate of output. This means that increase in exchange rate is associated with increase in growth rate of output in Nigeria. Similarly, money supply (0.97) had strong positive relationship with growth rate of output. This means that increase in Nigeria money supply is associated with increase in growth rate of output in Nigeria. The correlation coefficient of interest rate (0.36) had a weak but a positive relationship with growth rate of output. This means that increase in interest rate is associated with increase in growth rate of output in Nigeria. The correlation coefficient among the explanatory variables shows that there is the absence of strong relationship among them. This means that there evidence to reject the presence of multicollinearity in the model specified.

Table 4.2 Correlation Matrix

	GRPUT	EXR	M2	INR
GRPUT	1.00	0.83	0.97	0.36
EXR	0.83	1.00	0.74	0.32
M2	0.97	0.74	1.00	0.37
INR	0.36	0.32	0.37	1.00

Unit Root Test

Unit root test in this study is use to investigate whether or not growth rate of output, exchange rate, money supply and interest rate time series are stationary and to find out their order of integration. Table 4.3 below shows results for the unit root test for the variables at levels and first-difference using the Dicky-fuller (DF) and Augmented Dicky-fuller (ADF) test. The unit root test was conducted to provide information on the stationarity of the variables over time and to determining the order of integration of the variables.

Table 4.3 Unit Root test at levels

Variables	ADF Statistic	ADF Lag	ADF Critical Value (5%)	Order of integration	Remarks
GRPUT	5.2450	2	-2.9862	I(0)	*Stationary
EXR	-0.3416	0	-2.9762	I(0)	Not Stationary
M2	4.3259	6	-3.0123	I(0)	*Stationary
INR	-4.2932	0	-2.9762	I(0)	*Stationary

.Note * Stationary base on ADF test

Table 4.3A, shows that growth rate of output (GRPUT), money supply (M2) and interest rate (INR) were stationary at levels while exchange rate (EXR) not were stationary at levels. This therefore means that using the OLS regression techniques at levels in estimating the

model would lead to spurious regression results since some of the variables were not stationary. In order to resolve this problem, the first differences of the variables were taken and they were subjected to the ADF Unit root test. Table 4.3B, shows the results of the Unit root test at first difference using the ADF test which include an intercept and a linear trend.

Table 4.3B Unit Root test at first difference

Variables	ADF Statistic	ADF Lag	ADF Critical Value	Order of integration	Remarks
GRPUT	-4.7311	1	-3.6032	I(1)	*Stationary
EXR	-4.9318	0	-2.9810	I(1)	Stationary
M2	4.4441	6	-3.0206	I(1)	Stationary
INE	-4.2932	0	-2.9762	I(1)	Stationary

Note * Stationary base on ADF test

The results from table 4.3B, shows that after taking the first-difference of the variables and testing for their stationarity property, they all became stationary. This therefore means that the best regression results will be obtained when the first differences of the variables are used to estimate the model. The results also show that the variables are all integrated of order one. The lesson from these tests is that exchange rate as a monetary variable was not stationary at levels but becomes stationary over time when their first difference mean and variance values are plotted over time. Since the variables are found to be stationary at levels and first difference, the results from the estimation of the models are unlikely to be biased and inconsistent. The test conducted so far shows that the variables under study possess desirable empirical characteristics that qualify them to be included in a vector autoregression (VAR).

Vector Autoregressive Test

Table 4.4 below revealed that current growth rate of output is significantly influenced by the first-two lag of money supply. The result also revealed that current money supply is significantly influenced by the first-two lag of money supply and growth rate of output gap. Meanwhile, exchange rate, interest rate and previous money supply tend to exert insignificant influence on monetary innovation through growth rate output during for the period 1985 to 2012 and this strongly suggests that exchange rate, interest rate and previous money supply are not a significant lead indicator of current monetary innovation.

However, the estimated vector autoregressive result that captures the interrelationship between exchange rate, money supply and interest rate and growth rate output gap revealed that growth rate of output gap does not significantly influence exchange rate and interest independently. In the case of money supply, growth rate output gap revealed that growth rate of output gap does significantly influence money supply independently.

Monetary innovation and growth rate of output gap have significant influence on current money and growth rate of output gap in Nigeria based on the reported F-statistic result and even suggesting structural stability of the estimated as also confirmed by the VAR stability condition check test. This is presented below.

Table 4.4: Monetary Innovation and Growth rate of Output 1985-2012

	GRPUT	EXR	M2	INR
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GRPUT(-1)	0.693630 (0.25549) [2.71486]	-1.90E-06 (2.4E-06) [-0.80422]	0.256549 (0.06389) [4.01535]	1.31E-06 (2.5E-06) [0.51398]
GRPUT(-2)	0.254990 (0.37911) [0.67260]	2.62E-06 (3.5E-06) [0.74699]	-0.042739 (0.09481) [-0.45081]	1.78E-06 (3.8E-06) [0.47280]
EXR(-1)	34701.67 (23331.6) [1.48732]	0.705978 (0.21609) [3.26706]	-779.5799 (5834.61) [-0.13361]	-0.146396 (0.23187) [-0.63138]
EXR(-2)	-12805.30 (26531.7) [-0.48264]	0.209977 (0.24573) [0.85451]	-6821.360 (6634.88) [-1.02811]	0.065797 (0.26367) [0.24954]
M2(-1)	-0.570295 (0.88858) [-0.64180]	7.53E-07 (8.2E-06) [0.09145]	1.046518 (0.22221) [4.70957]	-2.16E-06 (8.8E-06) [-0.24485]
M2(-2)	1.073740 (0.70428) [1.52460]	-2.18E-06 (6.5E-06) [-0.33420]	-0.457195 (0.17612) [-2.59592]	-3.45E-06 (7.0E-06) [-0.49237]
INR(-1)	1821.570 (25556.9) [0.07128]	0.327821 (0.23670) [1.38497]	1887.018 (6391.10) [0.29526]	-0.069723 (0.25398) [-0.27452]
INR(-2)	-3656.198 (23989.0) [-0.15241]	0.576360 (0.22218) [2.59414]	-2404.114 (5998.99) [-0.40075]	-0.058001 (0.23840) [-0.24329]
C	33099.78 (532601.) [0.06215]	13.28658 (4.93277) [2.69354]	-150768.8 (133189.) [-1.13199]	-7.928902 (5.29294) [-1.49802]
R-squared	0.990148	0.963491	0.995683	0.335283
Adj. R-squared	0.985512	0.946311	0.993651	0.022475
Sum sq. resids	3.80E+13	3255.879	2.37E+12	3748.696
S.E. equation	1494244.	13.83916	373670.1	14.84963
F-statistic	213.5754	56.08011	490.1141	1.071851
Log likelihood	-401.0143	-99.68397	-364.9783	-101.5163
Akaike AIC	31.53956	8.360306	28.76756	8.501252
Schwarz SC	31.97506	8.795801	29.20305	8.936747
Mean dependent	11054183	76.50769	3226074.	-0.246923
S.D. dependent	12414288	59.72624	4689768.	15.01937

Impulse Response Function Analysis

The result of the impulse response of monetary innovation to one standard deviation shock exerted on exchange rate money supply, interest rate and output is presented in table 4.4.1, while the response plot is presented in the appendix.

Table 4.4.1 impulse response of monetary innovation

	GRPUT	EXR	M2	INR
1	1494244. (207214.)	0.000000 (0.00000)	0.000000 (0.00000)	0.000000 (0.00000)
2	871494.9 (386742.)	539641.7 (318231.)	-207928.3 (300092.)	22848.08 (320578.)
3	629566.4 (364083.)	496230.7 (238065.)	-3631.857 (362064.)	97586.01 (328994.)
4	675439.6 (359189.)	619756.2 (251174.)	99705.06 (345895.)	390385.8 (255668.)
5	939733.2 (383782.)	675462.7 (299267.)	108403.7 (320070.)	415954.3 (257920.)
6	1183532. (440077.)	820476.8 (360674.)	-26002.22 (335358.)	460059.1 (297158.)
7	1276307. (529287.)	1001193. (449747.)	-148651.2 (399820.)	500114.4 (368342.)
8	1309976. (637827.)	1187276. (533677.)	-194008.0 (485845.)	581587.4 (437045.)
9	1376507. (755627.)	1377305. (620159.)	-193138.1 (567710.)	699345.7 (493378.)
10	1519140. (879382.)	1577713. (715621.)	-202282.9 (640538.)	829145.1 (554190.)

The table above revealed that growth rate of output is more significantly responsive to its one squared variance to its own shocks and monetary shocks compared to growth rate of output shocks all through the 10 horizons.

SUMMARY OF FINDING

In this study, various literature and theoretical issues surrounding monetary innovation and growth of rate of output extensively discussed. The result showed that after taking the first-difference of the variables and testing for their stationarity property, they all became stationary. This therefore means that the best regression results will be obtained when the first differences of the variables are use to estimate the model. The results also shows that the variables are all integrated of order one. The lesson from these tests is that exchange rate as monetary variable was not stationary at levels but becomes stationary over time when their first difference mean and variance values are plotted over time. In addition, an empirical analysis was undertaken to

investigate impact of monetary innovations on growth rate of output. The empirical results show that that current money supply is significantly influenced by the first-two lag of money supply and growth rate of output gap. In addition, exchange rate, interest rate and previous money supply tend to exert insignificant influence on monetary innovation through growth rate output during for the period 1985 to 2012 and this strongly suggests that exchange rate, interest rate and previous money supply are not a significant lead indicator of current monetary innovation.

From the aforementioned, it is therefore clear that short and long term movement in equity prices are mostly explained by investors' sentiment/behaviour. Following the summary of our empirical finding are some recommendations that can be drawn from this study.

CONCLUSION

The preceding section reveals that money supply plays a significant role in determining the movement in growth rate of output in Nigeria. Moreover, the exchange rate and interest rate were related to growth rate of output but had an insignificant influence when compared to money supply. By way of the recommendation extracted from this study, it is important to consider the powerful influence of money supply in the movement of growth rate of output in Nigeria.

RECOMMENDATION

Given the findings of this study, it is now clear that money supply is a monetary innovation fundamental in predicting movement in the growth rate of output in Nigeria. The study recommends that exchange rate and interest rate should be regulated. This study also recommends the need for monetary authorities to implement policy that effectively enhanced money supply.

REFERENCES

- Abbas, D. & Husain, A. (2006). The sources and dynamics of inflation in indonesia; An ECM Model Estimation for 1952-2002, *Applied Econometrics and International Development*, 5-4
- Abdul Majid, M.Z (2007) 'Causality link between money, output and prices in Malaysia; An empirical re-examination, *Applied Econometrics and International Development* , 7-1
- Adefeso, H.A. & Mobolaji, H.I (2010). The fiscal-monetary policy and economic growth in Nigeria: Further empirical evidence. *Pakistan Journal of Social Sciences*, 7(2), 137-142.
- Adesoye, A. B. (2012). Price, money and output in Nigeria: A Co-integration-Causality Analysis. *African Journal of Scientific Research*, 8(1), 427-442
- Ahmed, N, Asad, I., & Hussain, Z. (2013). Money, Prices, Income and Causality: A Case Study of Pakistan. *The Journal of Commerce*, 4(4): 19-24
- Ajisafe, R. A & Folorunso (2002). The relative effectiveness of fiscal and monetary policies in macroeconomic management in Nigeria. *The African Economic and Business Review*, 3(1), 23-40.
- Balogun, E (2007), Monetary policy and economic performance of West African Monetary Zone countries. MPRA Paper No. 3408.

- Bilquess, F., Mukhtar, T & Sohail, S. (2012). Dynamic causal interactions of money, price, interest rate and output in Pakistan. *Journal of Economic Cooperation and Development*, 33(3), 37-64.
- Chimobi, O.P & Uche, U.C (2010). Money, price and output. A causality test for Nigeria. *American Journal of Scientific Research*, 8(5), 78-87.
- Christopher, E. A. (2006). Macroeconomic variables and stock market interactions: New Zealand Evidence. *Journal of Investment, Management and financial Innovation*, 3(4), 234-240.
- Dwivedi, D.N. (2005). *Managerial Economics* Sixth Edition VIKAS Publishing house PVT LTD New Delhi India.
- Emeh, O.A & Johnson, A.A (2010). Effects of exchange rate movements on economic growth in Nigeria. *CBN Journal of Applied Statistics*, 2(2), 19-40
- Eze, T. C & Okpala, C.S (2014). Quantitative analysis of the impact of exchange rate policies on Nigeria's economic growth: A test of stability of parameter estimates. *International Journal of Humanities and Social Science*, 4(7), 265-288
- Folawewo, A.O. & Osinubi, T.S (2006). Monetary policy and macroeconomic instability in Nigeria: A rational expectation approach. *Journal of Social Sciences*, 12(2), 93-100.
- Kaldor, N (1982). *The Scourge of Monetarism*. Oxford: Oxford University Press.
- Keynes, J. M (1936). *The General Theory of Employment, Interest and Money* London: Macmillan.
- Khosravi, A. & Karimi, M. S. (2010). To Investigate the Relationship between Monetary Policy, Fiscal Policy and Economic Growth in Iran: Autoregressive Distributed Lag Approach to Cointegration. *American Journal of Applied Sciences*, 7(3), 420 - 424.
- Mishra, P.K. & B.B. Pradhan (2008): Financial Innovation and Effectiveness of Monetary Policy. <http://ssrn.com/abstract=1262657>.
- Nicholas, M.O (2010). Interest Rate Deregulation, Bank Development and Economic Growth in South Africa: An Empirical Investigation. *International Business and Economic Journal*, 9(11), 131-142.
- Obamuyi, T.M (2009). An Investigation of the relationship between Interest rate and Economic growth in Nigeria, 1970-2006". *Journal of economics and International Finance*, 1(4), 93-98.
- Ogbole, F.O. (2010). Fiscal Policy and Macroeconomic Performance in Nigeria. *Unpublished PhD Thesis, Department of Banking and Finance, Rivers State University of Science and Technology, PortHarcourt.*
- Ogunmuyiwa, M. S & Ekone, F. A. (2010). Money Supply—Economic Growth Nexus in Nigeria. *Journal of Social Sciences*, 22(3), pp. 199-204.
- Omoke, P. C and Ugwuanyi, C. U (2010): Money, price and Output: A Causality test for Nigeria.

American Journal of Scientific Research, Issue 8.

- Onyeiwu, C., (2012). Monetary policy and economic growth of Nigeria. *Journal of Economics and Sustainable Development*, 3(7): 62 -70.
- Osiegbu, P.I. & Onuorah, A.C. (2012), "Fundamentals of finance". C.M. Global Co. Ltd. Cable-Point, Asaba, Delta State.
- Paddy, R (1992). Institutional reform in emerging markets, Policy Research Working Paper (Financial Policy and Systems), The World Bank WPS907. Pakistan", *European Journal of Economics, Finance and Administrative Sciences*, 46
- Rodric, D. (2006). The Real Exchange Rate and Economic Growth, Harvard University, Cambridge, September.
- Rodriguez, G.H. & Diaz, G. G. (1995). Macroeconomics Fluctuations in Peruvian Economia. *Working paper. Lima: Banco Central de Reserva del Perú.*
- Rogers, J. H., and Wang, P. (1995). Output, Inflation and Stabilization in a Small Open Economy: Evidence from Mexico. *Journal of Development Economics* 46(2),271-293.
- Saibu, M. O. & Nwosa, L. P. (2011). Effects of Monetary Policy on Sectoral Output Growth in Nigeria (1986-2008). *Journal of Economics and Behavioural Studies*, 2(6), 245-254.
- Starr, M (2005), Does money matter in the CIS? Effects of monetary policy on output and prices, *Journal of Comparative Economics* (33) 441-461.