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# ARE THERE ANY FEASIBLE ANTI-CYCLICAL POLICIES FOR NIGERIA IN THE ERA OF GLOBAL ECONOMIC CRISIS?

Philip O. Alege

## ABSTRACT

*This paper is an empirical examination of the role of Nigerian domestic macroeconomic policies in managing the pro-cyclical effects of externally generated boom-burst cycles. It applies Vector Autoregression (VAR) framework on Nigerian quarterly data from 1970:1 to 2006:4 and estimates the responses of monetary and fiscal measures to unanticipated shocks over different horizon. The paper concludes that the Nigerian economy is far from converging towards a sustainable equilibrium in the short run but analysis carried far into the horizon indicates that the variables converge uniformly to the steady state equilibrium. The paper suggests that both monetary and fiscal policies could be used to address the current global crisis from domestic perspective. However, authorities must use the right mix of these policies to avoid conflicts.*

## 1.0 INTRODUCTION

The current global economic crisis follows a period of economic boom: 2003-2007 during which the world economy was growing at an average of 5 percent per annum. However, the current crisis was precipitated by a combination of factors including emergence of subprime rates in the USA housing sector, deepening crisis in the financial markets, rising crude oil prices and surges in commodity prices. This has triggered-off series of bankruptcies, forced mergers, loss of employment, firm closures and concerns in the corridors of economic policy analysts in the USA and major capitalist economies. Responses to the crisis have been decisive: huge bailout plans, measures to support key institutions, stabilizing markets, and bolstering confidence. In the wake of this crisis, world economic growth rate has dropped to about 1 percent between the fourth quarter of 2007 and third quarter of 2008 (World Economic Outlook, 2008). This boom-burst phenomenon is reminiscent of the Great Depression of the 1930s.

The phenomenon of business cycle has not become a core research agenda in Africa. The volatility and contagion characteristics of international macroeconomic variables are essential features of instability in macroeconomic policy decisions and governance in Africa. In effect, African economies being business cycle takers are expected to experience the consequences of the current boom-burst. According to the World Economic Situation and Prospect (2008: 2), between 2003 and 2007, African economy grew at 4.6 percent, 5.0 percent, 5.3 percent, 5.6 percent and 5.8 percent. That trend in economic growth in the Sub-Saharan Africa (SSA) is expected to moderate in the face of this financial turmoil.

Consequently, major research questions include: Are there international co-movement between Africa economies and the rest of the world? What are the implications of the crisis on output, employment, trade and finance? What are the policy options to curtail the negative effects of the crisis on the African economies? Thus, the main objective of the paper is to examine the role of African domestic macroeconomic policies in managing the pro-cyclical effects of externally generated boom-burst cycles. This is achieved by analyzing the effects of various macroeconomic policy shocks – fiscal, monetary, trade, and productivity – by applying the Vector Autoregression (VAR) approach to the Nigerian data. Two specifications are presented in the paper with a view to identifying the nature and source of the shocks to the Nigerian economy.

The rest of the paper is structured as follows: In Section 2 the paper describes the Nigerian economic environment given the recent events and how it impacts the economy. Section 3, gives a brief literature review on policy measures adopted to counter economic downturns. Section 4 provides the methodology adopted and in particular the specification of the VAR model proposed in the paper. In Section 5, the paper estimates the model, presents and discusses the results. Section 6 concludes.

## **2.0 MACROECONOMIC POLICIES, SHOCKS AND THE NIGERIAN ECONOMY**

In Alege (2008: 63-66), the poor performance of the Nigerian economy was discussed. The boom-burst phenomenon characteristic of a mono-cultural oil economy was highlighted and the policy measures undertaken reviewed. However, it is necessary to review the macroeconomic policy issues that pervaded the era. In effect, fiscal, monetary, trade and development policies dominated the macroeconomic policy space in Nigeria. From the pre-1970 to 1985, the Keynesian

demand management was the policy thrust while from 1986 to the recent experience, the free market economy posture dominated the management of the economy.

For most part of the period under study, macroeconomic stability basically meant a mix of external and internal balance to ensure full employment, sustainable economic growth and low inflation rate. Economic policy was constrained by several factors, including the structure of the economy, during the period. According to Onimode (1995:57), there are several lessons to be learnt especially during the period 1960-1986. These include the need to focus policy consistently on the objectives and parameters of development rather than on mere growth and stabilization; the need for the country to address the perverse structures inherited from colonialism; policy discontinuity which has been a chronic problem since the 1970s; and the need for policy reversal that can cope with the desired recovery and transformation of Nigeria's economy.

The above may not be uncorrelated with the dismal performance of the economy during the era. Looking at the international perspective of macroeconomic policy during the 1970s and 1980s, Ocampo (undated: 1) opines that fiscal balance and price stability moved to the centre stage supplanting the Keynesian emphasis on real economic activity. This, he says, constitutes a policy shift that downplays the countercyclical role of macroeconomic policy. The latter, however, recognized that high inflation and unsustainable fiscal deficits have costs and that 'fine-tuning' of macroeconomic policies to smooth out the business cycle has limits.

In the case of Nigeria, crude-oil revenue exposed her to highly pro-cyclical financial swings characteristic of volatile crude-oil prices which "replaced Keynesian automatic stabilizers with automatic destabilizers" in the words of Stiglitz (2002) as contained in Ocampo (undated). It is also evident that pro-cyclical macroeconomic policies have not encouraged growth, in many developing economies including Nigeria; they have in fact increased growth volatility. The macroeconomic performance up till 1990s have awakened interest in the role that countercyclical macroeconomic policies can play in smoothing out the intensity of business cycles in Nigeria.

According to Ravenna (2006:1), an important goal of real and monetary business cycle theoretical research is to explain the empirical evidence on the impact of economic shocks on macroeconomic variables. Modern theories of business cycles attribute cyclical fluctuations to the cumulative effects of shocks and disturbances

that continually buffet the economy. This implies that without shocks there are no cycles (Chatterjee, undated: 1). Nigeria is faced with a lot of domestic and external economic and non-economic factors that render her economy highly volatile. According to Okonjo-Iweala and Osafo-Kwaako (2007: 7), a major challenge for the Nigerian economy is its macroeconomic volatility driven largely by external terms of trade shock and the country's excessive reliance on oil export earnings.

Various shocks are however susceptible to affect the economy. Consequently, in the presence of these random, unexplained shocks, the existence of business cycle in Nigeria is hardly in doubt. What is important therefore is to examine which of the shocks are at the origin of Nigeria's business cycles and review policy measures that could be adopted to mitigate the adverse effects of the business cycles. In particular, this study is of the view that shocks are the ultimate sources of business cycles and hence the type of shocks that drive the economy will dictate the nature and direction of policy.

Given the fact that business cycles are short-run fluctuations around long-term growth, expansion and contraction of business cycles have their costs on the economy. In this respect the capacity and ability of governments to conduct countercyclical policies could be a contributing factor to the growth of the economy. In many less developed countries, macroeconomic policies tend to be pro-cyclical- exacerbating rather than alleviating the adverse impacts of the booms and bursts on the long-term growth. The cost of pro-cyclical policies for Nigeria and indeed many developing economies is very high. Ocampo and Vos (undated: 33), contend that in the upturns, pro-cyclical macroeconomic policies, such as imprudent fiscal spending can lead to inefficient resource allocation, in some cases contributing directly to overheating in the economy and sowing the seeds of macroeconomic instability. In the downturns, pro-cyclical policies such as over-tightening of monetary policy and indiscriminate fiscal adjustments can lead to substantial losses in many valuable social projects, weakening accumulation of infrastructure and human capital as well as aggravating the downturn and reducing the potential for long term growth.

The policy response to the business cycles depends on the phase of the cycle where the economy finds itself. Countercyclical monetary and fiscal policies could, in principle, counteract the pro-cyclical effects that real exchange rate fluctuations are likely to have on the economy. Fiscal policy can always provide a useful countercyclical device. Indeed, it is frequently argued that fiscal policy is a more powerful countercyclical instrument than monetary policy in an open economy.

A fundamental reason for the incapacity to achieve sustained economic growth is that pro-cyclical adjustment typically damages public and private investment and thereby economic growth. Some countries focused on much more narrowly defined short-term stabilization objectives and have resulted many times in exchange rate overvaluation. Further, pro-cyclical macroeconomic policies probably also affect long-run investments in development especially in infrastructure and human development.

Fiscal policy has often been preferred in Nigeria in view of the underdevelopment of the financial sector up to the 1990s. According to Okonjo-Iweala and Osafo-Kwaako (2007: 7), public expenditure in Nigeria closely followed current revenues, implying that fluctuations in oil earnings were transferred directly into the domestic economy. Volatile fiscal spending also tended to cause real exchange rate volatility. In particular, fiscal expansions financed by oil revenues often resulted in domestic currency appreciation, creating Dutch Disease concerns and reducing competitiveness of non-oil economy (Barnett and Ossowski, 2002: 18).

As pointed out above, fiscal policy has often been used to counter adverse external shocks in Nigeria. At the heat of the current global financial melt down, the authorities have envisaged both fiscal and monetary policy options in cushioning the impact on the poor and the vulnerable. The fiscal counter-measures focused on increased consumer purchasing power by increasing transfers to the households, deficit financing, and infrastructural spending on roads, ports, airports, bridges, refineries and power plants. Monetary policy measures being envisaged to counter the cycle include introduction of additional liquidity into the system to prevent insolvency and distress, suspension of inflation targeting framework, reconfiguration of the present consumer basket for the computation of the consumer price index, increased surveillance of banks, and using the exchange rate as a major instrument of adjustment to establish internal and external balance of the economy.

The discussion above shows some of the policy measures that could be envisaged in response to shocks on the economy. In the case of the current crisis, economic agents' confidence have been so battered that government needs to tackle the problems from various angles: it needs to use fiscal stimulus to jumpstart the economy, envisage a restructuring of the financial system in order to strengthen banks, and employ monetary policy to arrest exchange rate volatility and liquidity concern in the money market.



### **3.0 BRIEF LITERATURE REVIEW**

The ultimate objective of policy is to design a macroeconomic framework that is conducive to growth characterized by a low and predictive inflation rate, an appropriate level of interest rate, a stable and sustainable fiscal policy, a competitive and predictive real exchange rate and a viable balance of payments. These objectives may be difficult to achieve in the presence of volatile and unstable macroeconomic environment and in particular, during the declining phase of the business cycle when the goal of policy is to evolve policy that will stimulate economic activities.

In this respect, there are evidences where monetary, fiscal, trade or investment policies have been used to stimulate economic activities. Taylor (2008) examines the current global financial crisis. His research questions include: What caused the financial crisis? What prolonged it? Why did it worsen so dramatically more than a year after it began? He contends that going by the classical explanation, financial crisis are caused by monetary excesses which lead to a boom and an inevitable bust. According to him, what prolonged the crisis includes a dramatic rise in the money market interest rates which is measured by the spread between three-month LIBOR and the three-month Overnight Index Swap (OIS). The spread being a measure of financial stress also affects the transmission mechanism of monetary policy to the economy. He thus opines that bringing the spread down becomes a major objective in dealing with the market turmoil.

Using statistical analysis between the period 2000 and 2006, the author provides evidences to support the fact that government actions and interventions caused, prolonged and worsened financial crisis. He recommends some "clean up" mode. This includes return to the principles for setting interest rate that worked well during the Great Moderation; future government intervention based on clearly stated diagnosis of the problem and rationale for the intervention; as well as creation of a predictable exceptional access framework for providing financial assistance to existing financial institutions.

Saizar and Chalk (2008) investigates whether or not monetary policy is a potent device in affecting output and inflation in countries that have low levels of credit and where investment and consumption are not financed by borrowing in local currency. The authors use a Panel Vector Auto Regression approach to examine the hypothesis for a certain number of emerging economies. The paper concludes that there is little empirical evidence that the level of credit or the degree of monetization represents a constraint on monetary policy. It also opines that

allowing for flexible exchange rate option is a more important factor in ensuring that monetary policy influences domestic inflation. Finally, with floating exchange rates, there is no evidence that the level of private sector credit has a meaningful impact on the effectiveness of monetary policy.

In a paper by Rogoff and Reinhart as contained in Reinhart(2009), the authors conclude that the current global crises are protracted, asset market collapses are deep and prolonged, there are profound declines in output and employment and there are significant adverse consequences of financial crises on government finances. In the same paper, titled "The Economic and Fiscal Consequences of Financial Crises", Reinhart concludes that it will be more difficult for more countries to grow their way out through higher exports. He also asserts that growth slowdown is amplified in the world commodity market as many countries face steep declines in their terms of trade.

The Role of Counter-Cyclical Fiscal Policy in Singapore is examined by Eskesen (2009). He asserts that a Structural Auto regression framework suggests that fiscal policy can be used for demand management, though the impact may be short-lived. The latter may be due to absence of credit-constrained economic agents, a high propensity to save among households, the use of quasi-fiscal measures not captured in budgetary data, a monetary focus on price stability and leakages due to the openness of the economy. He opines that fiscal policy can play a key stabilizing role during economic downturn given the downside risks to growth and the vast fiscal space.

Afonsa and Sausa (2009) examine the macroeconomic effects of fiscal policy using quarterly fiscal data which allows for precise identification of the effects of fiscal policies using U.S.A, the U.K, Germany and Italy for the periods: 1970:3-2002:4; 1964:2-2007:4; 1980:3-2006:4 and 1986:2-2004:4 respectively. The authors identify fiscal policy shocks using a recursive identification scheme and estimate a Bayesian Structural Vector Auto regression (B-SVAR) model. The results of the study show that (1) government spending have a small effect on Gross Domestic Product (GDP); (2) lead to important "crowding out" effects; (3) have a varied impact on housing prices and generate a quick fall in stock prices, and (4) lead to a depreciation of the real effective exchange rate.

In a 4-authored paper, Giordano, Modigliani, Neri and Perotti (2008) capture the effect of fiscal policy in Italy using a VAR model based on a quarterly data on selected fiscal variables for the period 1982:1-2004:4. The objective of the paper is

to study the effects of fiscal policy on private GDP, inflation and long-run interest rate. The results include: (1) a shock to government purchases of goods and services has a sizeable and robust effect on economic activities; (2) effects on employment, private consumption and investment are positive; (3) the response of inflation is positive but small and short-lived; (4) public wages have no significant effect on output while effect on employment turn negative after two quarters; and (5) shocks to net revenue have negligible effects on all the variables.

Ocampo (2000) observes that volatility and contagion characteristics of international financial markets have dominated emerging economies during the 1990s. In a paper entitled "Developing Countries' Anti-cyclical Policies in a Globalized World", the author examines the role of developing countries' domestic policies in managing the pro-cyclical effects of externally generated boom-burst cycles. He notes that given the asymmetries in the world economy, the volatility of capital flows generates strong pro-cyclical performance in the "business cycle/policy taking" periphery. The paper contends that there is the need to strengthen the institutional framework to prevent and manage financial crises at the global level. In order to provide room for maneuvering, the paper suggests the use of: (1) a combination of managed exchange rate flexibility cum capital account regulations; (2) strong "liability policies" to improve debt profiles; (3) an anti-cyclical management of prudential regulation and supervision of domestic financial systems; and (4) an adequate anti-cyclical fiscal policies.

#### **4. METHOD OF ANALYSIS**

##### **4.1 Introduction**

The use of VAR has become a standard method of analysis in empirical economics since Sims (1980). This is resulting from the failure of simultaneous equations models to provide good forecasting power and their insufficient representation of the dynamic interactions in a system of variables. Thus, the main strength of the method lies in the fact that it helps to observe impulse-response mechanisms, study variance decomposition of variables in the system, for forecasting, causality and policy analysis. These outcomes of VAR procedure are germane to identifying policy measures to address the current economic downturn. In particular, the methodology has been used to examine the effectiveness of macroeconomic policies (Saizar and Chalk, 2008; Eskesen, 2009). These authors contended that effectiveness is a prerequisite for efficiency but it is not a sufficient condition.

The use of VAR in impulse response analysis requires an identifying assumption on the structure of the model. In addressing this assumption, the recursiveness of the system of equations in the model is often used. The explanation resides on the fact that, given a quarterly data, activity reacts to other economic variables only with a lag. According to Olomola (2004), casual ordering amounts to assuming that the endogenous variables enter the system in a triangular form with the first equation containing are endogenous variables, the second two variables and so on given specific form to the matrix of disturbance coefficient”.

In many empirical works in recent times it has become necessary to ensure that the variables in the model are stationary. This is because it has been found that in many works working with unit root variables has led to spurious regression results. This is also an important issue when VAR is used. The normal approach is by differencing the variables that have unit roots and test for co-integration.

However, Sim (1980), Doan (1992) recommended against differencing. According to them, the goal of VAR analysis is to determine the interrelationship among variables in the system and not parameter estimates. They argue as contained in Ender (1995), that differencing “throws away” information concerning the variables. Given the focus of this paper, we assume that all variables are stationary. Consequently, given a set of  $k$  time series variables:  $y_t = (y_{1t}, y_{2t}, \dots, y_{kt})'$ , then the basic VAR(p), according to Baltagi (2003: 680), is of the form:

$$y_t = A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + u_t$$

where  $u_t = (u_{1t}, \dots, u_{kt})'$  is an unobservable zero-mean independent white noise process with time invariant positive definite covariance matrix  $E u_t u_t' = \Sigma$  and  $A_i$  are  $(k \times k)$  coefficient matrices.

In obtaining the impulse responses following a shock to the system, which is the goal of this paper, we adopt a variant of the procedure provided by (Saizar and Chalk, 2008:5) and it is written as follow:

$$A_0 Y_t = A(L)Y_t + H(L)Z_{1t} + e_{1t} \dots \dots \dots (1)$$

$$B_0 X_t = B(L)X_t + H(L)Z_{2t} + e_{2t} \dots \dots \dots (2)$$

Where  $Y_t : (rgdp, rm2, tex, eer, cpi, plr)$

$X_t : (rgdp, rge, tim, eer, cpi, plr)$

$Z_{1t} : (rge, tim, usr)$

$Z_{2t} : (rm2, tex, usr)$

$Y_t$  is vector of variables to trace the effectiveness of monetary policy while vector  $X_t$  captures the effectiveness of fiscal policy.  $Z_{1t}$  and  $Z_{2t}$  are vectors of exogenous policy variables.  $e_{1t}$  and  $e_{2t}$  are stochastic random terms. As discussed earlier, the assumption of recursiveness implies that  $A_0$  and  $B_0$  is lower triangular matrix with positive terms on the diagonal. The variables of the model are defined as follows: rgdp: real gross domestic product; rm2: real broad money supply; rge: real government expenditure; tex: real total exports; tim: real total import; eer: nominal exchange rate; usr: USA lending rate as a measure of world interest rate; cpi: consumer price index; and plr: prime lending rate

In testing for the effectiveness of policy measures this paper applies the VAR framework on Nigerian quarterly data from 1970: 1 to 2006:4 by estimating the responses of monetary and fiscal measures to unanticipated shocks over different horizon. The data are sourced from the International Monetary Fund's International Financial Statistics, 2008, July. Quarterly data are not available on some of the main macroeconomic aggregates even from this source thus limiting our analysis to those variables specified in the model. All variable are real at 2000 prices and the indices are assumed to be based on 2000 = 100. The software package to support the VAR analyses is EVIEWS 5.0.

## 5.0 EMPIRICAL RESULTS

### 5.1 Introduction

In estimating the reduced form VAR model under the condition that no restrictions are imposed, it is necessary to determine explicitly the lag length in the equations of the model. There are several criteria for choosing the optimal lag length in a VAR model. According to Baltagi (2003: 685) they are given as:

$$AIC(m) = \log \det \Sigma_u(m) + \frac{2}{T} mk^2$$

(Akaike, 1974)

$$HQ(m) = \log \det \Sigma_u(m) + \frac{2 \log \log T}{T} mk^2$$

(Hannan and Quinn, 1979)

$$SC(m) = \log \det \Sigma_u(m) + \frac{\log T}{T} mk^2$$

(Schwarz, 1978)

For these criteria,  $\det(\cdot)$  is the determinant.  $\log$  is the natural logarithm and  $\Sigma_u(m) = T^{-1} \sum_{i=1}^T u_i u_i'$  is the residual covariance matrix estimator for the model of

order  $m$  obtained with a VAR and  $T$  is the sample size. In this paper, the lag length of 1, 2, 3, 4 were chosen and run in the estimation of the models. The model with the minimum AIC is the one with lag length of 2. This informs the order of the VAR procedure in the paper.

The paper now estimates two sets of VAR system to capture the effects of monetary and fiscal shocks on the Nigerian economy. Each of the system of equations is made up of six endogenous variables and three exogenous variables. In the monetary model, we examine the interrelationships among the endogenous variables of the system notably: real GDP, broad money supply (RM1), real total export (RTEX), the nominal exchange rate (EER), the consumer price index (CPI), and prime lending rate (PLR). The exogenous variables are real government expenditure (RGE), real total imports (RTIM) and lending rate in the USA (USR) which is used as a proxy for world interest rate. The second model is obtained by changing the role of RM1 and RTEX with those of RGE and RTIM. Following the estimation of the system, the paper then examines the impulse response functions and the variance decomposition of each model.

## 5.2 Impulse Response Functions

The impulse response functions trace out how the endogenous variables of the model respond to the shocks which the economy undergoes in a given period or it may trace out how the changes in one variable impact on the other endogenous variables. Figures 1 and 2 plot the impulse response functions for the monetary model while Figures 5 and 6 plot those of the fiscal model. The graphs are based on the output of the restricted VAR with analytic response standard error over ten periods and Cholesky degree of freedom adjusted. They show the response to Cholesky one standard deviation innovation.

Consider the graphs in Figure 1 as the entries of a square matrix. Each column indicates the response of a shock of an endogenous variable on the other endogenous variables. Thus, the first column depicts the effect of a positive temporary output productivity shock (LGDP) on the other variables. Hence, the first entry shows a temporary positive productivity shock causes an initial increase. This response at the instance of the shock to real GDP decays uniformly over the horizon. This column also shows that there is little or no effect on the other variables at impact. In fact, most of the variables increase slightly only to remain close to the steady state value of zero into the horizon.

In the case of a monetary supply shock the response of a temporary LM to itself is positive at impact but decreases uniformly into the horizon. However, the responses

of the other endogenous variables vary over time. Following a positive monetary supply shock, the real GDP, the exchange rate and the consumer price index exercised a little increase during the first quarter and remain close to the steady state value over the period. The response of total export to a monetary supply shock is positive at impact. But this reaches a maximum level in the first quarter only to coincide with the steady state during the 10<sup>th</sup> quarter and remain so thereafter. Similarly, following a unit shock from the money supply, the response of interest rate is positive and remains so over the period of analysis. All other columns in the Figure can be interpreted in a similar manner.

The paper further investigates the impulse response functions by considering the combined graph of the responses given an impulse from one of the endogenous variables. Figure 2 shows the six graphs from each of the endogenous variables. In understanding the functioning of the Nigerian economy, the paper uses the export sector to trace the transmission mechanism of a shock. An oil price shock has an immediate and direct effect on volume of export. In the short run a decrease in oil price will affect government revenue and therefore its expenditure budget. In order to maintain a balanced budget, government will result to a restrictive policy in order to restrain government expenditure. The government behaviour will cause the monetary authorities to engage a restrictive monetary policy approach which will shore up interest rate. Higher interest rate will cause gross investment to dwindle. Because of the fall in investment, aggregate price level tends to increase. This will be translated into lower demand for consumer goods. And since producers cannot sell all they produced, demand for employment in the labor market will fall and consequently the aggregate output in the economy as measured by the GDP will fall. This will further worsen the economic situation.

A closer look at Figure 2 shows that following a one standard deviation change in export shock, most of the variables in the graph underwent some increases, except interest rate and the economy drifting towards an equilibrium in the short-run. However, from the 11<sup>th</sup> quarter, most of the endogenous variables tend to converge towards the steady state value. A quick look at the other graphs reveals similar trends. The above scenario tend to describe the situation of the Nigerian economy in which it is observed that the economy is far from converging towards a sustainable equilibrium in the short run but analysis carried far into the horizon indicates that the variables converge uniformly to the steady state equilibrium.

The impulse response function from fiscal shock can be analyzed in similar manner as seen above: These are obtained from the second model constituted by six

endogenous variables notably LGDP, LGE, LTIM, EER, CPI, and PLR. The variable LTIM is designed as proxy to capture source of revenue to the government in absence of a comprehensive and an up to date data on government revenue. Figure 5 depicts the graphs of the impulse response functions. Using the second column to illustrate the impact of fiscal policy shock, it could be seen that a positive shock to government expenditure provokes a positive increase on impact and persists into the horizon. This unit increase in fiscal shock led to slight increase in other variables and they all converge to the steady state value over the horizon. However, the column shows that following a fiscal shock the response of interest rate was immediate. But this remains relatively close to the steady state without any sign of convergence even on the long run.

In a similar fashion, column three can be examined to assess the response of the various endogenous variables to total import shock. The total import rises in response to import shock only to fluctuate within the first four periods and converges to the steady state from above. However, this temporary positive fiscal shock has no effect on all the other variables on impact. In the case of EER the response rises slightly and converges from above the steady state value into the horizon. The response of interest rate which was null on impact further diminishes and remains under the steady state only to begin a timid convergence towards the end of the horizon.

In a similar manner as shown for the monetary shock, the combined graph of the responses can be investigated. Figure 6 depicts the graphs.

### 5.3 Variance Decomposition

The variance decomposition shows the percentage of error variance in one variable due to one standard deviation shock of the variable itself and other variables in the system. The results of variance decomposition help in ascertaining the relative importance of various variables in explaining the variations in the variables being considered. The graphs in Figure 3 depict the monetary shock model. One major observation is that along the principal diagonal where the variation of "own shock" is depicted, it is seen that the variance is high on impact and decline in a non-linear manner into the horizon. At a glance, except in isolated cases, the endogenous variables included in the model have no significant influence in the explanation of the variance of the other variables. In the case of PLR, responses to money supply shock augment gradually beyond the horizon from zero. This confirms the use of interest rate as an effective monetary policy instrument.



Table 2 shows the variance decomposition of money supply shock. It could be seen that “own shock” account for over 99 percent in the first period. Over time, its importance diminishes while that of the other variables increases and becomes statistically significant even at 1 percent into the horizon. Figure 4 shows the combined graphs of variance decompositions for all the endogenous variables. This figure indicates that “own shock” constitutes the predominant source of variation for all the variables.

**TABLE 2: VARIANCE DECOMPOSITION OF BROAD MONEYSUPPLY (Rm2)**

PERIOD	S.E	LDGP	LM	LTEX	EER	CPI	PLR
2	0.1257	0.32546	94.9378	1.3718	0.22459	2.9454	0.1737
		(-1.0111)	(-3.3473)	(-1.9371)	(-0.8190)	(-2.2154)	(-0.5848)
4	0.1815	0.4361	84.6381	6.5498	0.8322	4.4165	3.1273
		(-1.5595)	(-6.7749)	(-5.3434)	(-2.1505)	(-3.4063)	(-2.7606)
6	0.2271	1.2089	76.5511	10.0317	1.5213	4.4244	6.2626
		(-2.8344)	(-9.1187)	(-7.6834)	(-3.3612)	(-3.8202)	(-4.5583)
8	0.2655	2.2995	70.5695	11.6412	2.3151	4.3367	8.8380
		(-4.2102)	(-10.7219)	(-9.1033)	(-4.4180)	(-4.1048)	(-5.8468)
10	0.2981	3.4455	66.1689	12.1528	3.1248	4.2444	10.8635
		(-5.4659)	(-11.8342)	(-9.9560)	(-5.3682)	(-4.3448)	(-6.7504)
12	0.3259	4.5012	62.9097	12.1063	3.8871	4.1542	12.4416
		(-6.5681)	(-12.6542)	(-10.4687)	(-6.2255)	(-4.5621)	(-7.3574)
14	0.3496	5.4073	60.4753	11.8081	4.5710	4.0646	13.6737
		-7.5261	(-13.2968)	(-10.7745)	(-6.9854)	(-4.7706)	(-7.7495)
16	0.3701	6.1545	58.6423	11.4181	5.1682	3.9750	14.6419
		(-8.3573)	(-13.8207)	(-10.9538)	(-7.6434)	(-4.9808)	(-7.9961)

*Source: Author's estimation results using Eviews 5.0*

The sources of variation for fiscal shock can also be seen from figures 7 and 8. All the information therein tends to confirm the similar behavior of the variables of the model as seen in the case of the monetary shock. In particular, “own shock” accounts for predominant portion of the variations. Figure 7 displays the combined graphs of the importance of the variables on any of the system variables following an innovation on the variable being considered. At a glance, one could assess the contributions of all the variables in capturing the sources of variations on each of the other variable taking successively. On impact, the explanation for the variation in the innovation to “own shock” was fully provided by the variable itself. In the case of government expenditure a positive innovation is explained completely by LGE and LGDP on impact. However, while the contribution of these two variables decreases those of EER and LTIM increased over the period. The other two variables remain close to zero for the period.

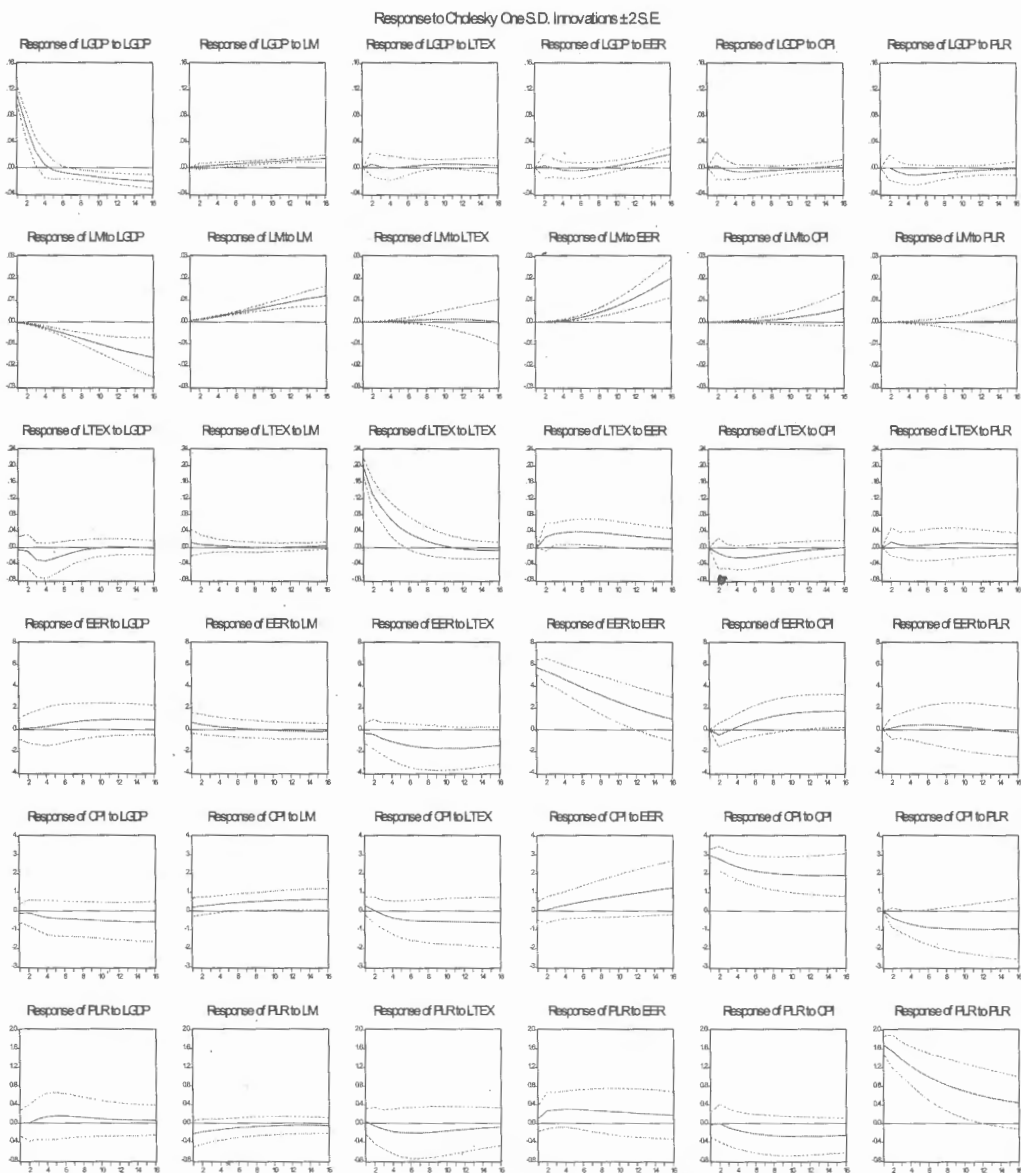
## 6. SUMMARY AND CONCLUSION

The paper examines the implications of global economic crisis on the Nigerian economy. It investigates the interrelationships between GDP and its major components with a view to assessing policy responses to mitigate the adverse effects of external volatilities for growth and development as well as comparative dynamics of the Nigerian economy.

The main findings of the paper are: (1) a positive monetary supply shock, has a positive effect on the real GDP, the exchange rate and the consumer price index during the first quarter and remain persistent over the period; (2) the response of total export to a monetary supply shock is positive at impact. But this reaches a maximum level in the first quarter only to coincide with the steady state during the 10th quarter and remain so thereafter; (3) similarly, following a unit shock from the money supply, the response of interest rate is positive and persists over the period of analysis; (4) export supply shock -to capture external vagaries- could lead to fall in economic activity by the standard Keynesian exposition; (5) fiscal shocks impact other variables though slightly; (6) following a fiscal shock the response of interest rate was immediate and remains relatively close to the steady state without any sign of convergence even on the long run; (7) total import rises in response to import shock only to fluctuate within the first four periods and converges to the steady state from above; (8) the temporary positive fiscal shock has no effect on all the other variables on impact; (9) own shocks account for predominant portion of the variations in all variables for both models; and (10) there is a significant relationship between government expenditure and real GDP.

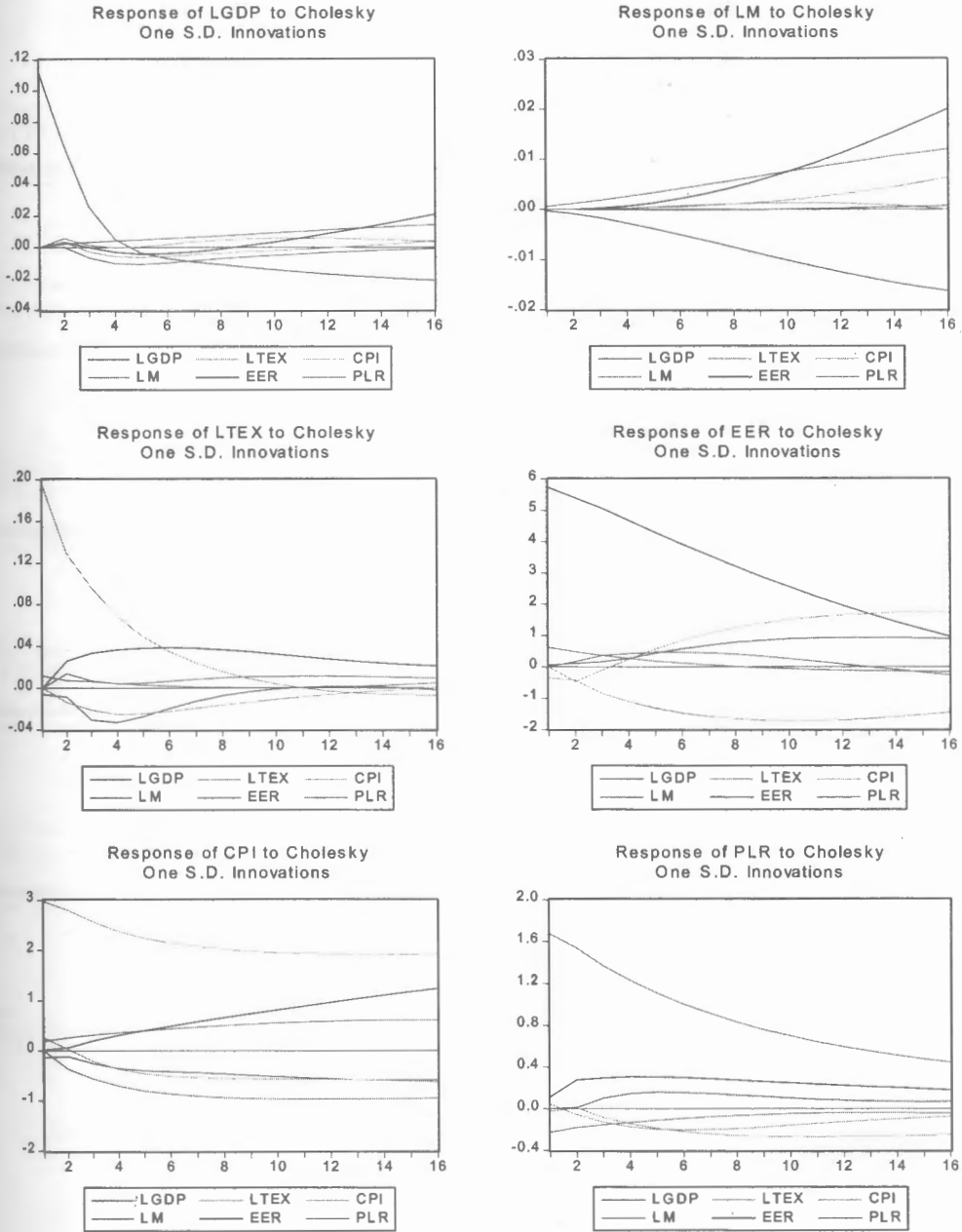
This paper concludes that the Nigerian economy is far from converging towards a sustainable equilibrium in the short run but analysis carried far into the horizon indicates that the variables converge uniformly to the steady state equilibrium. It shows that both monetary and fiscal policies could be used to address the impact of global crisis from the perspective. However, authorities must use the right mix of these policies to avoid conflicts.

Figure 1: Impulse Response Functions-Model I (multiple)



Source: All graphs are from the author's estimation results using *EViews 5.0*

Figure 2: Impulse Response Functions-Model I (combined)



**Figure 3: Variance Decomposition-Model I (multiple)**

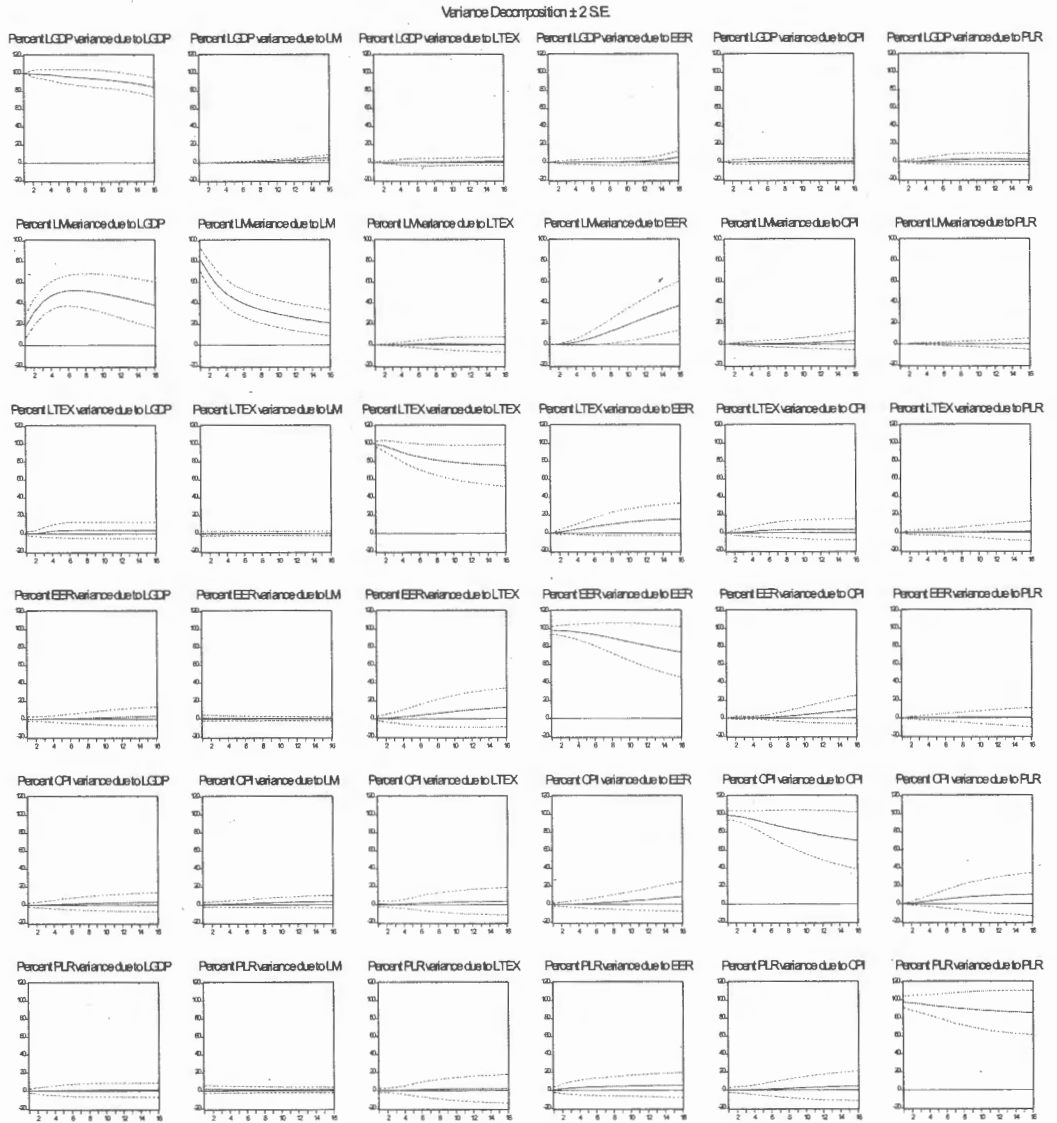
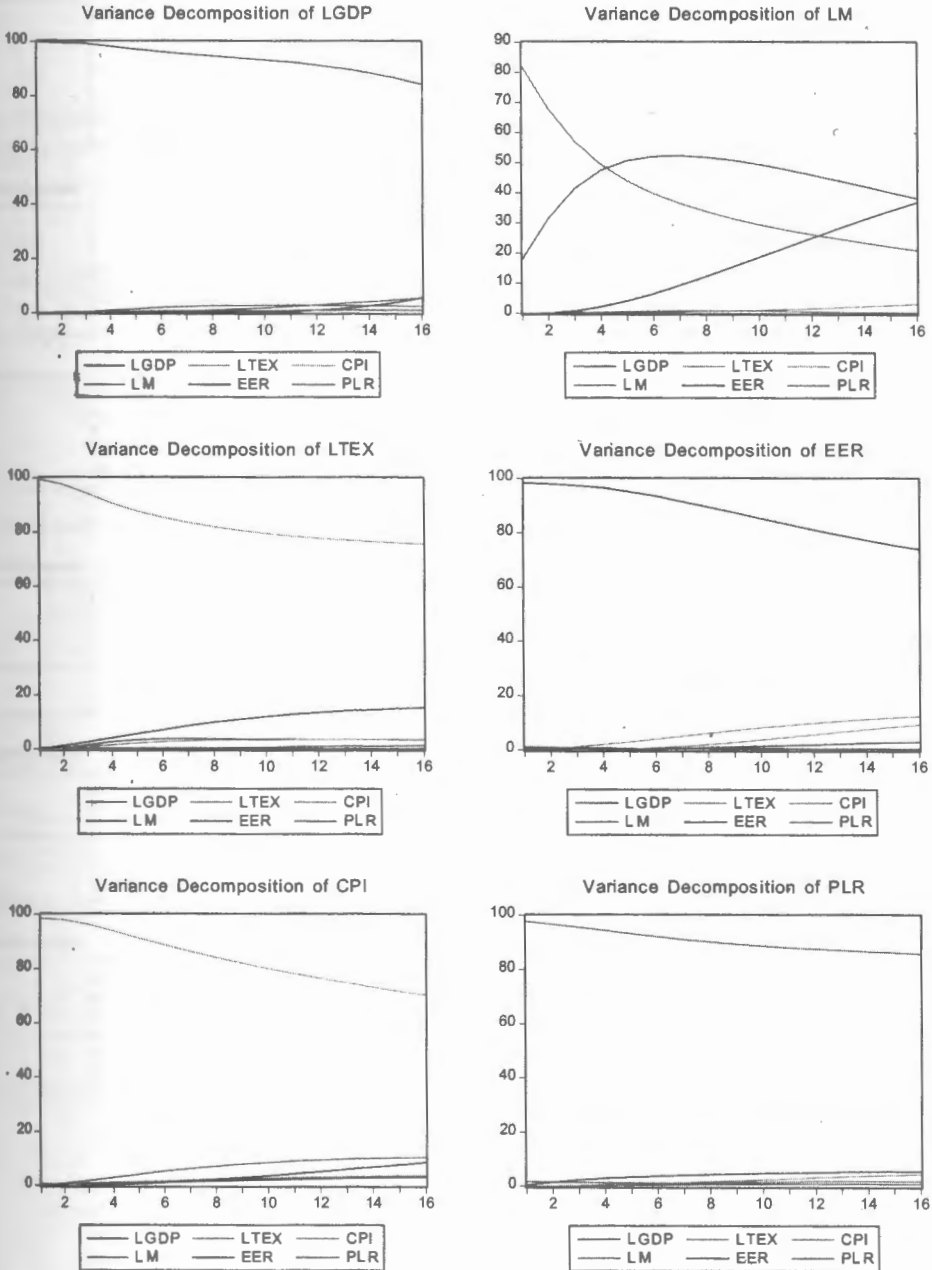


Figure 4: Variance Decomposition-Model I (combined)



**Figure 5: Impulse Response Functions-Model II (Multiple)**

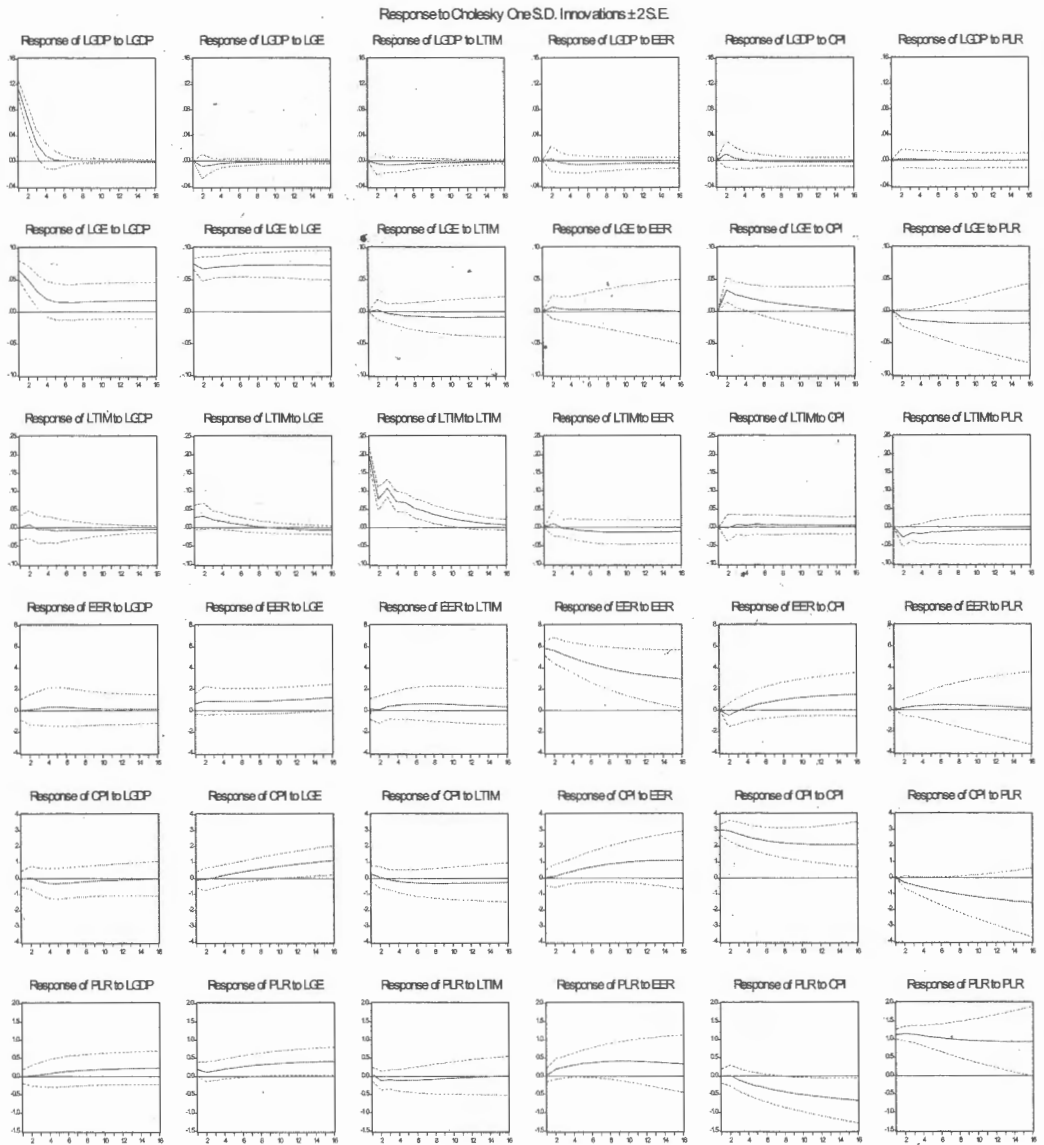


Figure 6: Impulse Response Functions-Model II (combined)

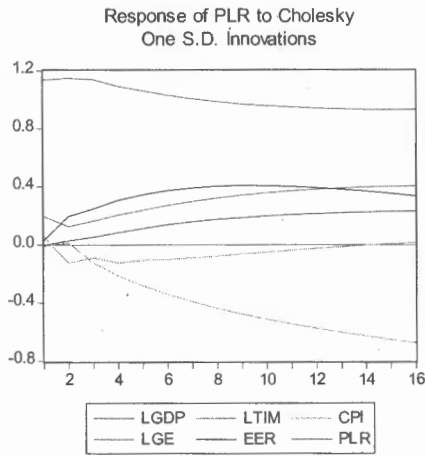
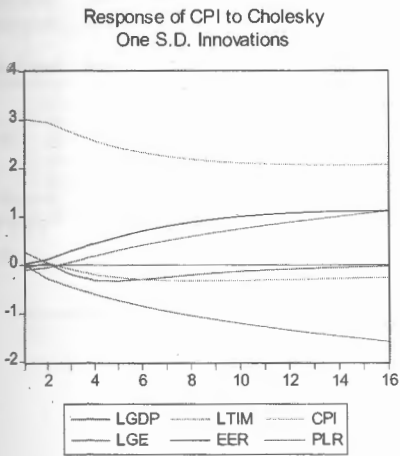
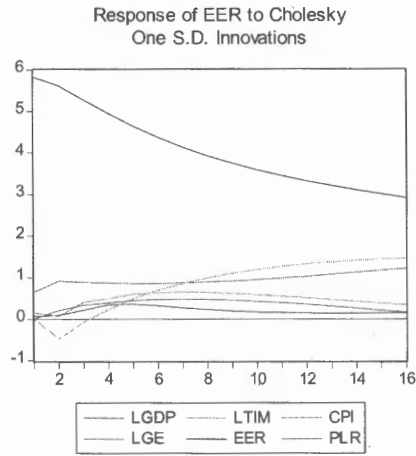
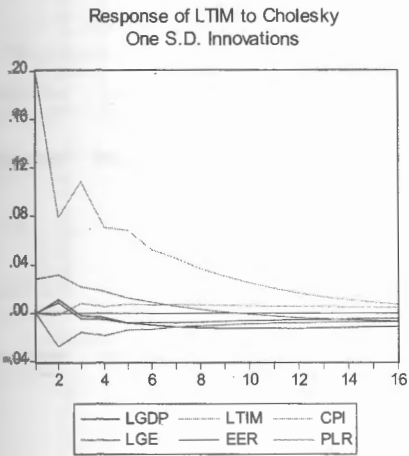
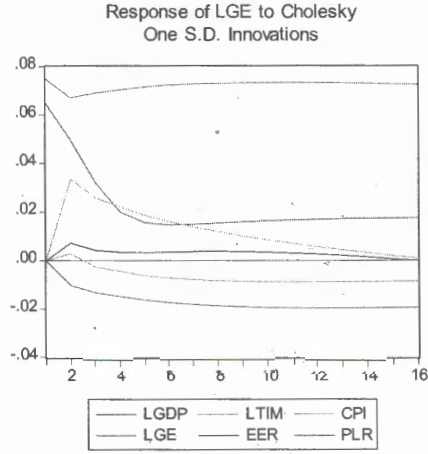
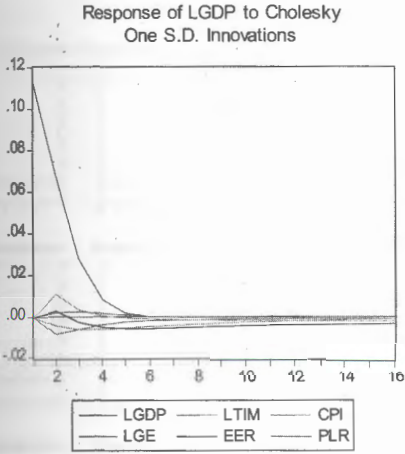




Figure 7: Variance Decomposition-Model II (multiple)

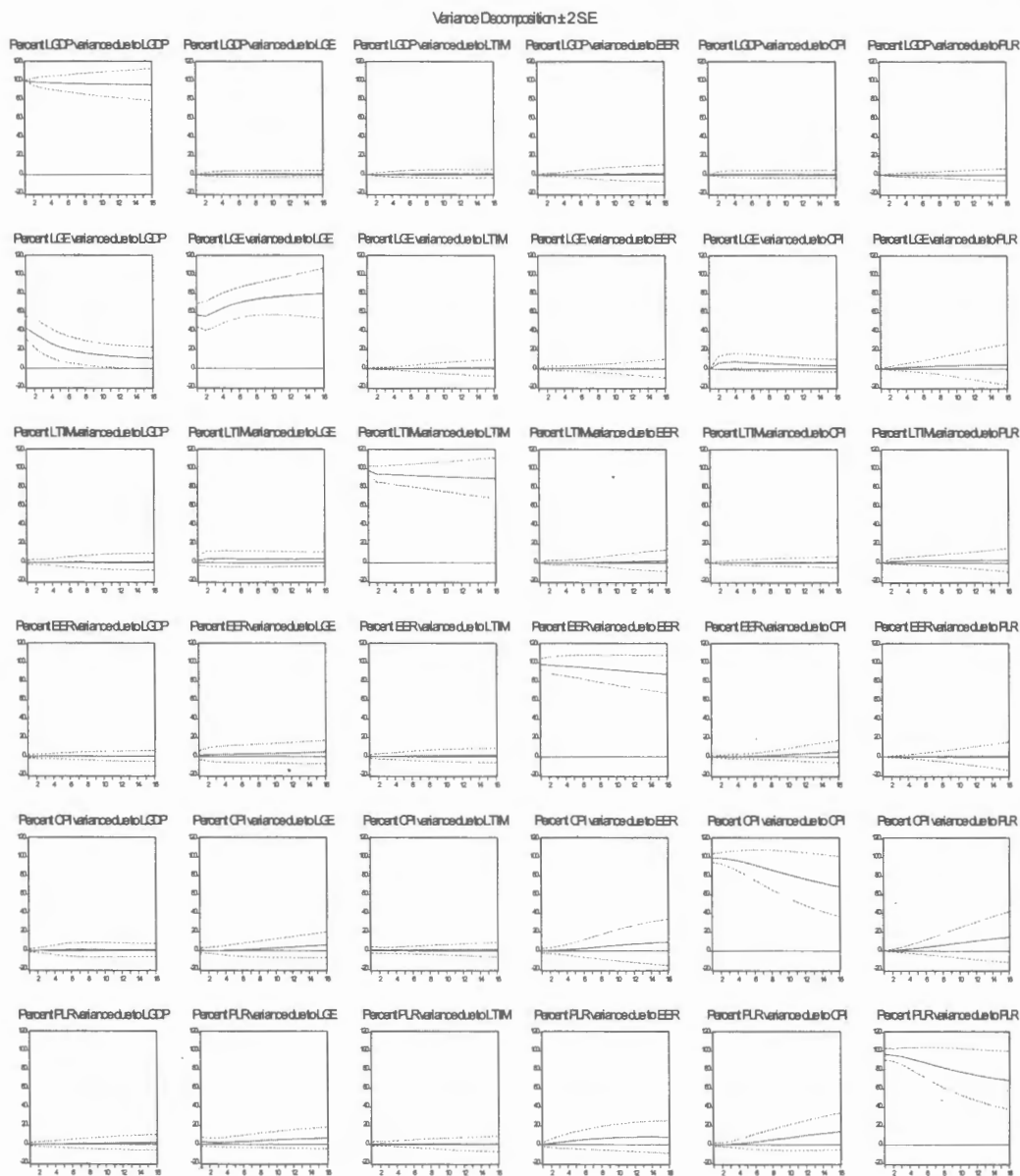
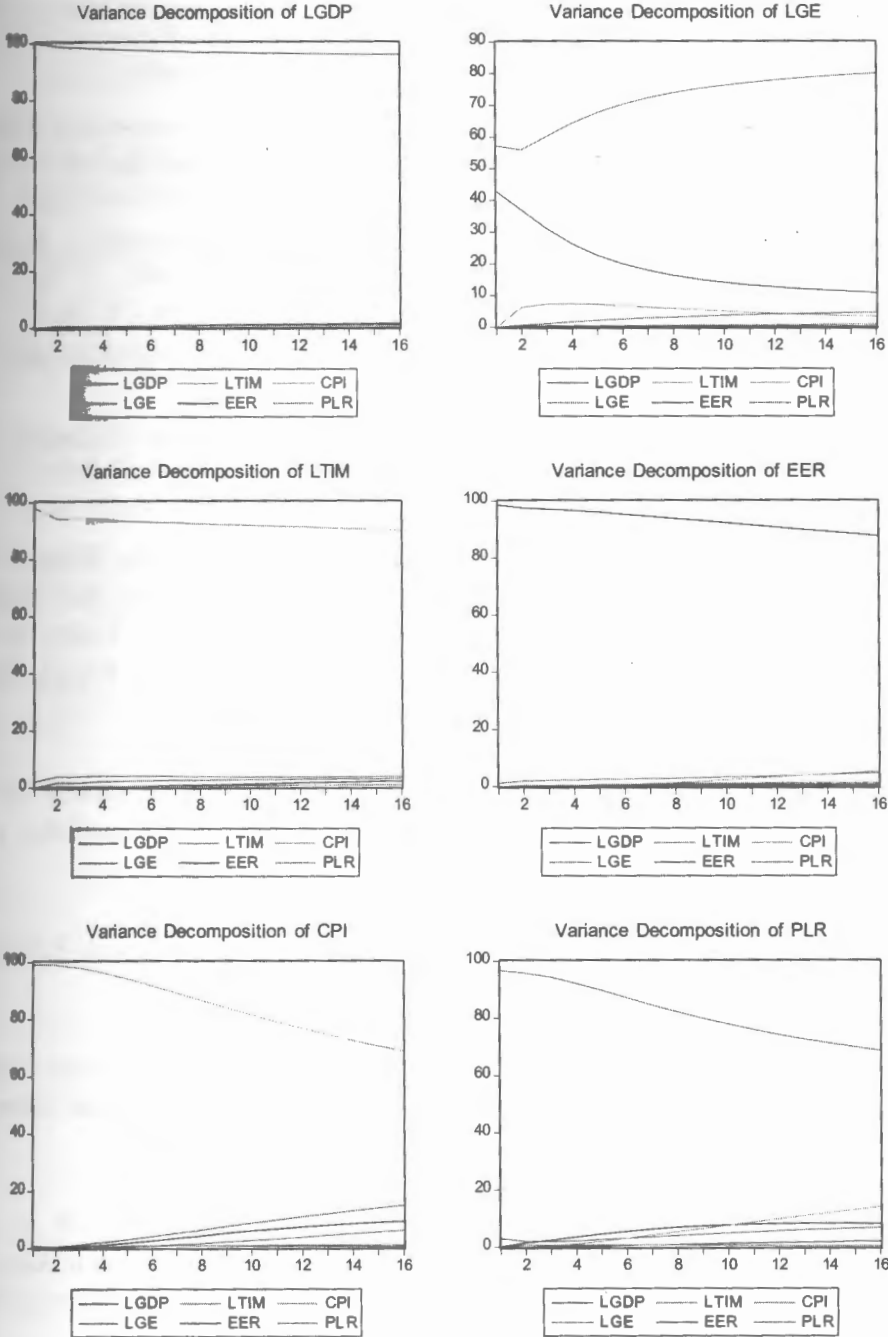


Figure 8: Variance Decomposition-Model II (combined)



## REFERENCES

- Alege, Philip O. (2008), "Macroeconomic Policies and Business Cycles in Nigeria: 1970-2004", Unpublished PhD Thesis, Covenant University, Ota, Nigeria
- Afonso, Antonio and Ricardo M. Sousa (2009), "The Macroeconomic Effects of Fiscal Policy", European Central Bank, Working Paper, No. 991
- Baltagi, Badi H. (2003), *A Companion to Theoretical Econometrics*, Blackwell Publishing
- Eskesen, Leif L. (2008), "The Role for Counter Fiscal Policy in Singapore", IMF Working Paper No. 9, available online  
@<http://www.imf.org/external/pubs/cat/longues.cfm>. Accessed 22nd January, 2009
- Enders, Walter (1995), *Applied Econometric Time Series*, John Wiley & Sons, INC. New York
- Giordano, Raffaella; Momigliano, Sandro; Neri, Stephano and Roberto Perotti (2008), "The Effects of Fiscal Policy in Italy: Evidence from a VAR Model", Banca D'Italia, Working Papers, Number 656
- Nwaobi, Godwin C. (undated), "Modeling Economic Fluctuations in Sub-Saharan Africa: A Vector Autoregressive Approach", available online  
@<http://myprofile.cos.com/gcnwaobi>
- Ocampo, Jose Antonio (2000), "Developing Countries' Anti-Cyclical Policies in a Globalized World", ECLAC, *Temas de Coyuntura*, Serie 13.
- Olomola, P. Akanni (2004), "A VAR Approach to Growth Empirics: Evidence from Selected Sub-Saharan African countries", *The Indian Journal of Economics*, No. 337 Part 2, Vol. LXXXV
- Onimode, Bade (1995), "Economic Development and Policy in an Open Economy: The Nigerian Experience Since 1960", in Iwayemi, Akin (ed.), "Macroeconomic Policy Issues in an Open Developing Economy: The Case of Nigeria", NCEMA, Ibadan

- Ravenna, F. (2006), "Vector Autoregression and Reduced Form Representation of DSGE Models", Banco de Espana, Working Paper No. 0619.  
Accessed March 6, 2007
- Reinhart, Carmen (2009), "The Economic and Fiscal Consequences of Financial Crises", MPRA Paper No. 13025. Accessed 9th February, 2009.
- Taylor, John B. (2009), "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong", NBER Working Paper 14631
- Saizar, Ana C. and Nigel Chalk (2008), "Is Monetary Policy Effective When Credit is Low?" IMF Working Paper, No. 288, online resource accessed 3rd February, 2009.
- Sims, C.A., (1980), *Macroeconomics and Reality*, Econometrical, 48, pp1-48
- United Nations (2008), "World Economic Situation and Prospects: Updates of mid-2008", N.Y.