

EXCHANGE RATE BEHAVIORS AND MACROECONOMIC INDICATORS NEXUS IN NIGERIA

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ABSTRACT

The empirical evidence from literature on the link between exchange rate behavior and macroeconomic variables has been inconclusive. The study employed the Vector autoregressive estimator to examine the impact of macroeconomics variables on exchange rate changes in Nigeria during 1986-2013. The co-integration result reveals that long run relationship exist between exchange rate and macroeconomic variables in Nigeria and that exchange rate do granger cause some macroeconomic variables in Nigeria. The study therefore suggests an efficient management of foreign exchange to enhance the performance of macroeconomic variables.

Keywords: Exchange rate volatility, Macroeconomic Indicators, Disaggregated analysis.

1.0 Introduction

Exchange rate is a fundamental macroeconomics variable that guides countries and investors on the best way to strike a balance with their trading partners (Odili 2007). The adoption of the structural Adjustment program (SAP) introduced by the international monetary fund (IMF) as a basis for financial intervention in most African countries facilitated the deregulation of the financial market that necessitated floating exchange rate regime in the mid- 1986 and

prevail till the end of April 1993 in countries like Nigeria. For its first phase exchange rate policies in most developing countries are often sensitive and controversial, mainly because of structural imbalance that characterized most of these developing countries.

The effects of exchange rate on macroeconomic variables in developed, and developing countries particularly in Nigeria cannot be over emphasized. It has long been a concern to both academics and policy maker

(Aghion *et al* 2006. Clark *et al* 2004). Whether the behavior of exchange rate affects macroeconomic variables has become topical in Nigeria following recent very high fluctuations in Naira exchange rate compared to other major currencies such as the US Dollars, Euro and British Pound Sterling. Several studies have been conducted to investigate the effect of exchange rate volatility and macroeconomics variables. The empirical evidences from the literature are inconclusive. (See Iqbal, Major & Habib 2011, Razaq and Akonji 2013, Azeez and Kolapo, Chiweisu 2012), This current study add to the debate in the extant literatures on exchange rates and macroeconomic variables nexus from the perspective of an emerging economy in Africa. The study therefore examines the impact of exchange rate fluctuations on macroeconomic variables in Nigeria. The paper employed a disaggregating period of analysis of four period i.e; the Structural Adjustment programme period, (SAP), the post Structural adjustment period, (post SAP), the National Economic Empowerment and Development period (NEEDS) and Global Economics and Financial crises period to capture the impact of exchange rate fluctuations on macroeconomic variables in Nigeria.

Specifically, the study tested the Scapegoat theory of exchange rate by Becchetta and Wincoop 2004, 2006 and 2011 in the Nigeria context. This study employed the dynamic method of Vector Autoregressive (VAR) framework to investigate the response of macroeconomics variables to exchange rate fluctuations and the Impulse response to examine the shocks. The paper provide answers to the following questions: What has been the trend and pattern of exchange rate fluctuations and macroeconomic variable in Nigeria over the years? Do changes in exchange rate have effect on macroeconomic variable in Nigeria? What is the transmission

mechanism between exchange rate changes and macroeconomic variables in Nigeria? What is the response of macroeconomic variables to exchange rate shocks in Nigeria? Apart from this section, this paper is further divided into four other sections. Section two focuses on the review of literature. The data and methodology is presented in section three. Section four dwells on the analysis of results while the last section provides the conclusion.

2.0 Literature Review

The scapegoat theory of exchange rate popularized by (Becchetta and Van Wincoop 2004, 2006, 2011) opined that the poor performance of exchange rate models may be explained by the omission of scapegoat variables such as inflation interest rate money supply and so on. The theory assumes that market participants may at times attach significantly more weight to individual fundamentals to rationalize the pricing of currencies which are partly driven by unobservable shocks in the form of liquidity trades. Bacchetta and Van Wincoop (2004,2005) also assume that agents have heterogeneous information whereas in their analysis develop a dynamic model, whereby the exchange rate is forward looking and depend on expectations of future fundamentals. The essence of this scapegoat theory of exchange rate is that some macroeconomic variable receive an unusually large weight and then are made scapegoat of exchange rate volatility. The second major hypotheses of the scapegoat theory of exchange rate as to do with identifying when a macro fundamental becomes a scapegoat. Bacchetta and Van Wincoop (2004, 2006, and 2011) opined that a particular macro variable is more likely to become a scapegoat when there are large shocks to the unobservable variable and relationship with its long term equilibrium value.

The empirical evidences on the effect of exchange rate and macroeconomic variables have generated series of debate in the literature particularly from the perspectives of the developed economies. Some of the pioneering studies include the works of Bagehot (1873), and Schumpeter (1912) that employed samples of 44 developed countries between 1975-1993 in investigating the relationship between exchange rate volatility and inflation targeting and the long run price stability using the traditional ordinary least squared method (OLS), they find a strong relationship between price stability, exogenous component of monetary policy and exchange rate volatility. However, Chowdhury (1993) argued that most of the macroeconomic variables used in previous studies were not put to stationary test hence the likelihood of getting a spurious result is very high thereby invalidate the findings of previous studies. Chowdhury (1993) focused specifically on the G-7 countries among the developed countries in investigating the impact of exchange rate volatility on trade flow. The study employed the multivariate error correction model framework between 1973-1990. The study find out that exchange rate has a significant negative influence on export volume of each of the G-7 countries. A similar study conducted by Arize (1996) for eight European countries using the same methodology of multivariate error correction model indicates that a significant negative relationship exist between real export and exchange rate volatility in the eight European countries used as samples.

In a similar study, Sukan and Hassan (2001) investigate the impact of exchange rate volatility on the U.S export. The result signifies that a negative relationship exist between exchange rate volatility and export in the U.S. Joseph and Pickard (2003) investigate the effect of exchange rate volatility on expected and unexpected bilateral trade flow in Canada,

USA and Mexico between 1996-2002. The study find out that exchange rate on bilateral trade flow for the sector are relatively minor where sustained change in the exchange rate, sectorial economies growth and price of goods being traded all exert more significant influence on trade level than exchange rate volatility. Seetanah and Padalhi (2011) examine the impact of exchange rate volatility on macroeconomic performance in Ireland between 1999-2010 using the generalized method of moments (GMM), the results show that a negative relationship exist between exchange rate volatility and current account balance but positively related to the growth rate of the economy, hence the study concluded that exchange rate volatility does not influence macroeconomic performance in Ireland. Oguchan and Nurtracy (2011) investigate the relationship between exchange rate volatility and industrial production in Germany and Russian using the structural vector Autoregressive model. The study find out that nominal exchange rate has effects on industrial product difference and real exchange rate.

A related study by Mamalo, Pwrrera and Masuduzzaman (2012) on the role of monetary policy on price stability and how monetary policy interact with exchange rate volatility in United Kingdom. The study employed the annual data from the period 1981-2012. The Johansen co-integration test and vector error correction model as well as the Granger causality test reveal a long run positive relationship between inflation targeting, monetary policy and exchange rate volatility in the United Kingdom. In the same vein, Erinch and Robert (2012) analyze the impact of exchange rate volatility on industrial production before and after the introduction of common currency in the European countries from 1980-2007 using the pooled data of the European countries. The E-GARCH model used reveals that all countries enjoyed

benefit after the introduction of common currency. This was evidenced in the reduction in the negative impact of real exchange rate volatility in most of the countries, although some of the countries faced increase in real exchange rate volatility. A recent study by Rees (2014), focus on the effect of exchange rate movement on Australian economy using the structural vector autoregressive model (SVAR). The result shows that ten percent appreciation of the real exchange rate that is unrelated to the terms of trade or interest rate depreciation lower the level of real GDP over the subsequent one to one year by 0.3% and year ended inflation by 3%. Majority of these reviewed studies in the extant literature were largely conducted in the developed economies where exchange rate and other macroeconomic variables were relatively predictable and stable due to well-developed financial markets and stable macroeconomic environment. The issue of fluctuation of exchange rate seems more prevalent in developing and emerging economies.

Several other studies in the literature have equally examined the impact of exchange rate fluctuations on macroeconomic variables from the perspective of developing countries and emerging economies. Mansor and Ruzita (2005) tested the dynamic response of manufacturing output to exchange rate and monetary policy shocks in Malaysia. The study employed the vector autoregressive model (VAR) and the shock was captured by the impulse response functions. The study reveal that monetary tightening leads to negative response from real activities, furthermore, the responses of manufacturing output seems bigger in magnitude than those of aggregate output or output from other sector.

In a related study by Michael (2009) on the effect of exchange rate volatility on sub-Saharan countries reveals that exchange rate volatility is higher in poorer countries and notably increase significantly with inflation

rate in sub-Sahara Africa. Gopalan (2010) investigated the relationship between exchange rate volatility and stock price in Mexico using the granger causality test. The study findings indicates that there is known long-run relationship between exchange rate and stock price in Mexico. Furthermore, Nazima (2011) assessed the impact of exchange rate volatility on foreign direct investment in Pakistan. The autoregressive distribution lag (ARDL) and the vector error correction model (VECM) were employed. The result reveals that exchange rate volatility has negative impact on FDI inflow in short run while its impact is positive in the long run. In a similar research conducted on the effect of exchange rate volatility on FDI in four Asian economies of Pakistan, India Bangladesh and Sri-lanka, the author used the GARCH, ARDL and the ECM model as estimators. The result shows mixed trends with significant effect of volatility in exchange rate on foreign direct investment in Asia countries

Maltinba (2011) examined the impact of exchange rate volatility on emerging market export, Nine (9) emerging countries were examined and the GARCH model was used. The author also makes use of the co-integration method. The study reveals that exchange rate volatility has significance negative effect on the performance of export regardless of the measure of volatility used. Iqbal (2011) analyze weather uncertainty in exchange rate affect macroeconomic variables in Pakistan from 1975-2005. The ordinary least square and the GARCH model were employed, the outcome shows that exchange rate volatility have a positive effect on Gross domestic product, growth rate, trades openness but a negative effect on foreign direct investment.

Wong and Tong (2011) examined the effect of exchange rate variability on export demand for semiconductors, which is the largest sub-sector electronics in Malaysia as

reported by Malaysia development Authority (MIDA, 2004). The study employed the Johansen's multivariate co integration technique and the error correction model. The result reveals that there is a long run relationship among export, relative price real foreign income and real exchange rate volatility. Hence exchange rate has some effect on semiconductor in both the long run and short run. Chiweuse (2012) investigated the relationship between Renmuibi (RMB) exchange rate and macroeconomic variable in China. The author use non parametric rank test by Breitung and the threshold error correction model (TECM) to test the non-linearity causal relationship. The study reveals that RMB, exchange rate and macroeconomic variable have non-linear relationship. Caglayan (2013) investigated the effect of real exchange rate uncertainty on manufacturers export from 28 emerging economics. The study used the two step system GMM dynamic panel data for the study, the result found out that exchange rate uncertainly affect trade flow emanating from emerging economies negatively. They equally found out that trade effect of exchange rate uncertainty may very well depends on the direction of trade. Ahmet and Cihat (2014) study the dynamic relationship between exchange rate, interest rate and stock market in Turkey from 2003-2013. The study employed the vector autoregressive model (VAR). The study find out that volatility shock create abrupt changes in the dynamics correlation but only in the short run and thus does not have a long run effect.

Aliyu (2008) using the OLS examine the impact of exchange rate deregulation and SAP on Cotton production in Nigeria from 1973-2007. The finding shows that exchange rate deregulation has no significant impact on Cotton production in Nigeria. In a similar research conducted by Abimbola, Adeniyi & Omisakan (2008) on the long and short run

impact of exchange rate volatility and price change in trade flow. The autoregressive distribution lag and Johannes co-integration approach employed to examine both the long run and short run relationship. The findings shows that both the short run and long run Nigeria trade flow are Chiefly influenced by income both domestic and foreign relative prices, nominal effective exchange rate and stock of external reserve. It also reveals that in the long run devaluation is more effective than relative price in altering import demand and both baseline.

Onafowora and Owoye (2008) examine the impact of exchange of volatility on Nigeria export from 1980-2001 the co-integration and vector error correction model was uses VECM. The result reveals that there exist a link between real exports, real foreign income, relative export price and real exchange rate volatility in the long run. It also reveal that the improvement in the terms of trade which is denoted by the decline in the real exchange rate and real foreign income exert positive effect on export activity. The overall findings suggested that Nigerian exporting activities could be further boosted by policies aimed at achieving and maintaining a stable competitive real exchange rate. In a similar study conducted by Babatunde and Olufemi (2012) on the relationship between exchange rate volatility and monetary policy shocks, the study employed the OLS and ECM and found out that both real and nominal exchange rate have been unstable in the review period.

Olanipekun (2013) examine the effect of exchange rate volatility on economic activities from import and export from 1990 to 2012. The GARCH model employed show that exchange rate volatility significantly influences export and investment of firm. In a related study by Umoru and Adaobi (2013) on the effect of short and long run response of aggregate trade balance to exchange rate adjustment between 2005 to 2009 using the

vector error correction model and the vector autoregressive model shows that a cyclical feedback between trade balances and real exchange rate depreciation of Naira. The study also found out no empirical evidence in the short run deterioration of the trade balance as implied by J-curve hypothesis. Odili (2013) examine the impact of exchange rate volatility on balance of payment BOP in Nigeria from 1971-2012. The study employ autoregressive distribution lagged (ARDL). The result provided evidence in favor of a positive and statistically significant relationship in the long run and a positive statistically insignificant relationship in the short run between balance of payment and exchange rate.

Obansa, Okorafor, Aluko & Millicent (2013) examined the relationship between exchange rate, interest rate and economic growth using the vector autoregressive model from 1970 to 2010. The results indicate that exchange rate have a strong impact on economic growth than interest rate particularly interest rate was found to be positive however decline as the horizon increased Onyeizugbe and Umeagugesi (2014) investigating how devaluation of naira affect the survival of industrial sector from 1990-2013. This study reveals that manufacturing capacity utilization has a positive relationship with exchange rate and export. Eze and Okpala (2014) equally investigate the impact of exchange rate and output of goods and services using the co-integration approach, the result reveal that both exchange rate and money supply are highly significant in the determination of Nigeria economic growth performance.

Akinlo and Lawal (2015) used the vector error correction model to examine the impact of exchange rate volatility on industrial production in Nigeria from 1986 to 2010. The result of the study using the VECM confirmed that there exist a long run relationship between industrial production index,

exchange rate and money supply and inflation rate. More so, exchange rate depletion had no perceptible impact on industrial production in the short run but have positive impact in the long run.

The review reveals that there is no consensus among scholars on the impact of exchange rate on macroeconomic variables. Some studies established positive relationship between exchange rate volatility and macroeconomic variables in developing countries, (See Iqbal 2006; Onyeizugbe and Umeagugesi 2014; Odeli, 2012). Other studies established a negative relationship between exchange rate volatility and macroeconomic variable: Nazima (2011) Johanees (2010) Ivan – T (2003). A host of other studies equally provides mixed results (See Glulan, Syedzulfiger, Mohammed and Bargram 2010; Wong and Tong 2011). The empirical divergence in the literature necessitates the recent investigation of the impact of exchange rate on macroeconomic variables with specific reference to Nigeria

3.0 Data and Methodology

The study employed secondary data from World Banks World development indicator, the Central Bank of Nigeria statistical bulletin, various editions of the Nigeria stock exchange publication and National Bureau of statistics. The data period chosen (1986-2013) was due to data availability, economics restructuring from a fixed exchange rate regime to a floating exchange period i.e. the structural adjustment period, Post SAP period, the NEED era and the Global Economics and Financial crises era.

3.1 Model specification

Sims (1980) seminal paper introduce unrestricting vector auto regressions (VAR) that allows feedback and dynamics interrelationship across all the variable in the system and appear to be highly competitive with the large scale macroeconomics models

in forecasting and policy analysis. To provide an empirical insight to the response of macroeconomics variables to exchange rate volatility in Nigeria, we estimate six macroeconomics variables, VAR model using GDP, INF, INT, MS, IMP, EXP and EXC. Hence, adopting the model of Edward (1989), Elbadawi (1994), and as modified by chi-wei-

su (2012). This study adopted the work of Chi-wei-su (2012) to include other variable to analyze the effect of exchange rate movement on macroeconomics variable in Nigeria. The study model the real exchange rate as a function of macroeconomic variables. Functionally the model appear thus:

$$EXC = f(GDP + CPI + INT + MS + IMP + EXP) \dots \dots \dots (1)$$

The econometric model is expressed below.

$$EXC = \sigma + \beta_1 GDP + \beta_2 CPI + \beta_3 INT + \beta_4 MS + \beta_5 IMP + \beta_6 EXP + \mu \quad (II)$$

Where EXH is the real exchange rate, GDP is the gross domestic product, INF is the rate of inflation measured as consumer price index, INT is the interest rate, MS is the money supply broadly defined, TOT is the total trade captured by import and export, α is the constant $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ & β_6 are the co efficient of GDP, INF, INT, MS, IMP and EXP respectively. In other to test for the co – integration analysis, this study chooses five economic fundamentals. Equation (1) is specified in a compact ways:

$$EXC = (GDP + CPI + INT + MS + IMP + EXP) \dots \dots \dots (III)$$

The variables are selected based on whether they influence exchange rate in accordance with theory. Given the non – linear co – integration found in previously, we advance to test the transmission using the (ECM) it can present as follows:

$$\begin{aligned} (EXC)_t = & \alpha_{10} + \sum_{i=1}^{k_1} \theta_{1i} \Delta(EXC)_{t-1} + \sum_{i=1}^{k_1} \theta_{1i} \Delta(GDP)_{t-1} + \sum_{i=1}^{k_1} \theta_{1i} \Delta(INT)_{t-1} \\ & + \sum_{i=1}^{k_1} \theta_{1i} \Delta(CPI)_{t-1} + \sum_{i=1}^{k_1} \theta_{1i} \Delta(MS)_{t-1} + \sum_{i=1}^{k_1} \theta_{1i} \Delta(IMP)_{t-1} \\ & + \sum_{i=1}^{k_1} \theta_{1i} \Delta(EXP)_{t-1} + \varepsilon_{1t} \dots \dots \dots (IV) \end{aligned}$$

$$\begin{aligned}\Delta(GDP)_t = & \alpha_{20} + \sum_{i_2}^{k_2} \theta_{2i} \Delta(EXC)_{t-1} + \sum_{i_2}^{k_2} \theta_{2i} \Delta(GDP)_{t-1} + \sum_{i_2}^{k_2} \theta_{2i} \Delta(INT)_{t-1} \\ & + \sum_{i_2}^{k_2} \theta_{2i} \Delta(CPI)_{t-1} + \sum_{i_2}^{k_2} \theta_{2i} \Delta(MS)_{t-1} + \sum_{i_2}^{k_2} \theta_{2i} \Delta(IMP)_{t-1} \\ & + \sum_{i_2}^{k_2} \theta_{2i} \Delta(EXP)_{t-1} + \varepsilon_{2t} \dots \dots \dots (V)\end{aligned}$$

$$\begin{aligned}\Delta(INT)_t = & \alpha_{30} + \sum_{i_3}^{k_3} \theta_{3i} \Delta(EXC)_{t-1} + \sum_{i_3}^{k_3} \theta_{3i} \Delta(GDP)_{t-1} + \sum_{i_3}^{k_3} \theta_{3i} \Delta(INT)_{t-1} \\ & + \sum_{i_3}^{k_3} \theta_{3i} \Delta(CPI)_{t-1} + \sum_{i_3}^{k_3} \theta_{3i} \Delta(MS)_{t-1} + \sum_{i_3}^{k_3} \theta_{3i} \Delta(IMP)_{t-1} \\ & + \sum_{i_3}^{k_3} \theta_{3i} \Delta(EXP)_{t-1} + \varepsilon_{3t} \dots \dots \dots (VI)\end{aligned}$$

$$\begin{aligned}\Delta(CPI)_t = & \alpha_{40} + \sum_{i_4}^{k_4} \theta_{4i} \Delta(EXC)_{t-1} + \sum_{i_4}^{k_4} \theta_{4i} \Delta(GDP)_{t-1} + \sum_{i_4}^{k_4} \theta_{4i} \Delta(INT)_{t-1} \\ & + \sum_{i_4}^{k_4} \theta_{4i} \Delta(CPI)_{t-1} + \sum_{i_4}^{k_4} \theta_{4i} \Delta(MS)_{t-1} + \sum_{i_4}^{k_4} \theta_{4i} \Delta(IMP)_{t-1} \\ & + \sum_{i_4}^{k_4} \theta_{4i} \Delta(EXP)_{t-1} + \varepsilon_{4t} \dots \dots \dots (VII)\end{aligned}$$

$$\begin{aligned}\Delta(MS)_t = & \alpha_{50} + \sum_{i_5}^{k_5} \theta_{5i} \Delta(EXC)_{t-1} + \sum_{i_5}^{k_5} \theta_{5i} \Delta(GDP)_{t-1} + \sum_{i_5}^{k_5} \theta_{5i} \Delta(INT)_{t-1} \\ & + \sum_{i_5}^{k_5} \theta_{5i} \Delta(CPI)_{t-1} + \sum_{i_5}^{k_5} \theta_{5i} \Delta(MS)_{t-1} + \sum_{i_5}^{k_5} \theta_{5i} \Delta(IMP)_{t-1} \\ & + \sum_{i_5}^{k_5} \theta_{5i} \Delta(EXP)_{t-1} + \varepsilon_{5t} \dots \dots \dots (VIII)\end{aligned}$$

$$\begin{aligned}\Delta(IMP)_t = & \alpha_{60} + \sum_{i_6}^{k_6} \theta_{6i} \Delta(EXC)_{t-1} + \sum_{i_6}^{k_6} \theta_{6i} \Delta(GDP)_{t-1} + \sum_{i_6}^{k_6} \theta_{6i} \Delta(INT)_{t-1} \\ & + \sum_{i_6}^{k_6} \theta_{6i} \Delta(CPI)_{t-1} + \sum_{i_6}^{k_6} \theta_{6i} \Delta(MS)_{t-1} + \sum_{i_6}^{k_6} \theta_{6i} \Delta(IMP)_{t-1} \\ & + \sum_{i_6}^{k_6} \theta_{6i} \Delta(EXP)_{t-1} + \varepsilon_{6t} \dots \dots \dots (IX)\end{aligned}$$

$$\begin{aligned}\Delta(EXP)_t = & \alpha_{70} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(EXC)_{t-1} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(GDP)_{t-1} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(INT)_{t-1} + \\ & \sum_{i_7}^{k_7} \theta_{7i} \Delta(CPI)_{t-1} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(MS)_{t-1} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(IMP)_{t-1} + \sum_{i_7}^{k_7} \theta_{7i} \Delta(EXP)_{t-1} + \\ & \varepsilon_{7t} \dots \dots \dots (\end{aligned}$$

Estimation procedures

The study employed the following estimation procedures: The first step in the estimation procedures is to conduct unit root test by testing the order of integration of the data. Engle and Granger (1987) opined that if independent series are stationary then the series are said to be co integrated. Hence both the Augmented Dickey Fuller tests (1979) and Philips Peron (1988) test were employed. After establishing that the variables are stationary, the next step is to determine whether they have long run co movement among the variables using the Johansen co integration approach. The choice of the method among others is inform by its ability to estimate system involving two or more variables in other to circumvent the problems associated with the traditional regression of Engle and Granger. The Granger causality test examine whether or not past changes in one variable help to explain the current change in another variable. As co integration examine the relationship, granger causality check for transmission mechanism between the variable. Thus to examine the transmission mechanism between exchange rate and macroeconomics variable we use Granger

causality test. The Variance Decomposition can be described as the causality test outside the estimation period; VDC decomposes variation in an endogenous variable into the component shocks to the endogenous in the VAR. The VCD gives information about the relative importance of each of random shocks to the variable in the VAR. it equally shows the percentage of forecast error variance for each variable that may be attributed to its own shocks and fluctuations in the other variables in the system. Impulse Response Function measure the prediction of response to a one standard deviation shocks to one of the system variable.

4.0 Results and Discussion

4.1 Trend Analysis

Figure 4.1 Show the movements of the exchange rate, gross domestic product and money supply over the period 1986-2014. The figure shows that exchange rate witnessed slight reduction in all the quarters of 1986 but picked up in 1987 only to increase continuously till the fourth quarter of 1990. It further depreciated continuously from the first quarter of 1990 to the last quarter of 1997. The exchange rate assumed spike value from the second quarter of 1998 till fourth

quarter of 2000 to rise above both gross domestic product and money supply. This could be attributed to policy change as a result of change in government from the military government to a civilian. However, the exchange rate depreciated massively in 2000, this downward trend was below both the gross domestic product and money supply till 2013. On the other hand, gross domestic product and the money supply equally experienced a reduction in between the 1989 and 1991. It increases in the second quarter in 1992 and decline to be above

the exchange rate. It continues to decline till around 1998 and the declined continued till the last quarter of 2013. It equally shows that money supply rise above exchange rate in 1987 and slightly decline below exchange rate and GDP in 1991. It rise again to maintain a somewhat constant trend till around 2013. The implication of the graph is that at a low exchange rate, GDP and money supply will be above the exchange rate, however, with a spike in the exchange rate both GDP and money supply is far below the exchange rate

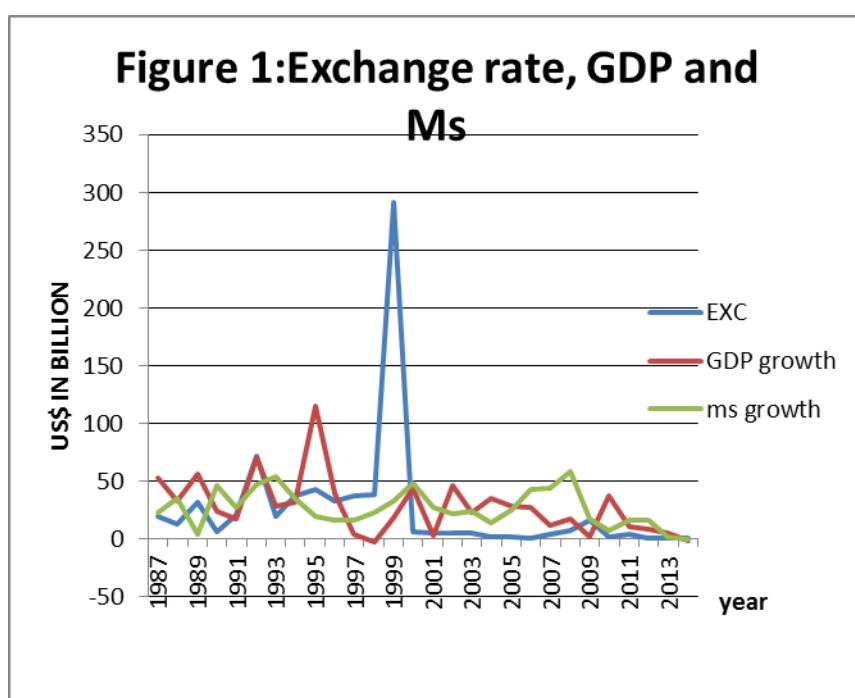


Fig. 4.1: Trend of Exchange rate, GDP and Ms.

The figure 4.2 shows the trend of the exchange rate, import and export over the period 1986-2014. The figure shows that exchange rate witnessed slight reduction in all the quarters of 1986 but picked up in 1987 only to increase continuously till the fourth quarter of 1990. With respect to the exchange rate, it depreciated continuously from the first quarter of 1986 to the last quarter of 1991.

The extent of depreciation, however, increased sharply from the first quarter of 1991 up to the first quarter of 1997. The exchange rate assumed spice value from the second quarter of 1998 till fourth quarter of 2000 to rise above import and export. Import on the other hand maintained on upward trend from 1989 to 1991 to rise above both exchange rate and export. It decline till around

1994 only to experience an upsurge in its trend in 1994 and a sharp decline in 1996. It rises after which it continues to an upward trend till 2014. Export on the other hand maintains an upward movement to rise above import in some quarter of the year under review. It also experiences an upsurge in its trend between

1993 and 1996, only to decline in the last quarter of 1996. It increases in 1998 to 1999, it further declines and later rises to be above both import and exchange rate in 2002 to 2005, exchange rate and import continue to decline till the last quarter of 2014.

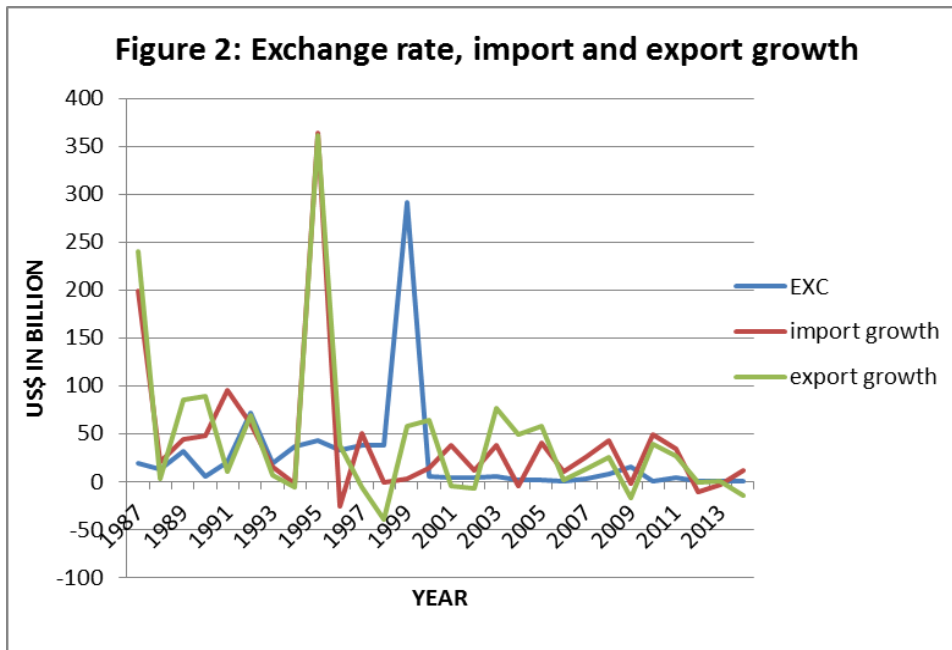


Fig. 4.2: Trend of Exchange rate, import and export growth.

The figure 4.3 shows the movement of exchange rate, interest rate and inflation proxy as consumer price index. It shows that exchange rate witnessed slight reduction in all the quarters of 1986 but picked up in 1987 only to increase continuously till the fourth quarter of 1990. With respect to the exchange rate, it depreciated continuously from the first quarter of 1986 to the last quarter of 1991. The extent of depreciation, however, increased sharply from the first quarter of 1991 up to the first quarter of 1997. The exchange rate assumed spice value from the second quarter of 1998 till fourth quarter of 2000 to rise above both consumer price index and interest rate. Interest rate on the other hand maintained somewhat constant trend

from 1987 to 1989 to rise above exchange rate, it however fall below exchange rate between 1993 to around 2001 before its constant trend to rise above both exchange rate and consumer price index. Consumer price index on the its own increase between 1986 and 1987 before it sharp decline in 1989 far below exchange rate, it maintain an upward trend till around 1994 to be above both exchange rate and interest rate. It further decline till around 1999. Possible reasons for these could be as a result of policy change accounted for by change in government, it continue on a somewhat downward trend to rise above exchange rate but below interest rate.

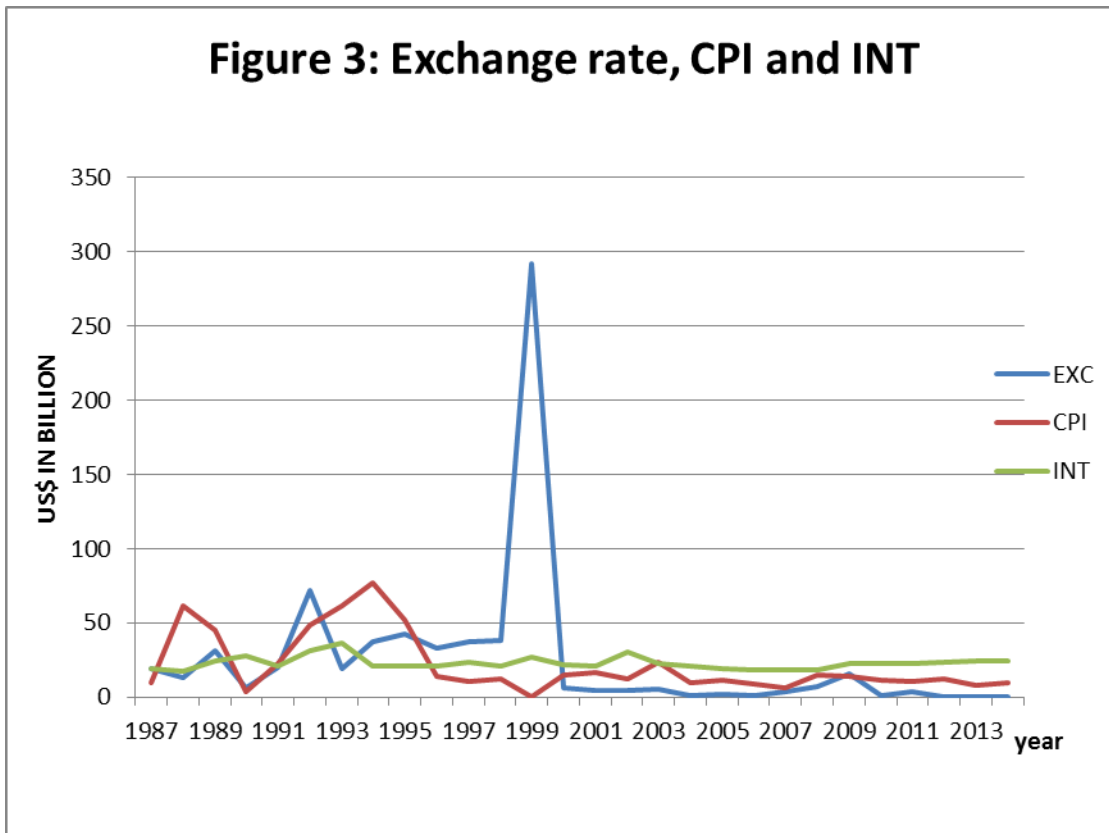


Fig. 4. 3: Trend of Exchange rate, CPI and INT

4.2 Data Presentation and Analysis of Results

4.2.1 Presentation of Data: Descriptive Statistics

The descriptive statistics of the variables as summarized in table 4.2.1 (Insert table 4.1 about here) show that all variables namely exchange rate (EXC), gross domestic product (GDP), consumer price index (CPI), interest rate (INT), money supply (MS), import and export are positively skewed. This means that they have long right tail. However, from the kurtosis statistic, the table shows that the distribution of exchange rate, gross domestic product, consumer price index, money supply

interest rate and import are peaked relative to the normal with kurtosis exceeding 3, which shows that they are leptokurtic distribution ($kurtosis > 3$). It was found that Jarque-Bera statistics with its associated p values for variables like exchange rate, gross domestic product, consumer price index, interest rate, money supply, import and export are lower than 0.10 which implies that variables under our consideration are normally distributed. The descriptive statistics shows that all the values are normally distributed about its mean and variance or in other word, we observe randomness in data.

Table4.1: Descriptive Statistics

	EXC	GDP	CPI	INT	MS	IMPORT	EXPORT
Mean	33.34287	12120992	21.23017	22.59189	3986.441	2836.871	4557.465
Median	7.461668	4582127	12.16854	21.55	1036.1	985.0224	1744.178
Maximum	291.8318	42396766	76.75887	36.09	15669	10995.86	15262.01
Minimum	0.11754	69147	0.223606	12	27.4	5.9836	8.9206
Std. Dev.	68.35224	14620600	19.95911	4.619492	5512.215	3587.534	5374.278
Skewness	3.091287	1.019711	1.490247	0.802395	1.203707	1.232276	0.919947
Kurtosis	11.3787	2.555011	3.935269	4.665718	2.836217	3.060909	2.346297
Jarque-Bera	131.0157	5.265022	11.791	6.464542	7.035476	7.343914	4.606813
Probability	0	0.071898	0.002752	0.039468	0.029666	0.025427	0.099918
Sum	966.9433	3.52E+08	615.6749	655.1648	115606.8	82269.25	132166.5
Sum Sq. Dev.	130816.8	5.99E+15	11154.25	597.5119	8.51E+08	3.60E+08	8.09E+08
Observations	29	29	29	29	29	29	29

Source: Author's computation 2015

4.2.2 Matrix Correlation

The study equally examines the correlation among the variables under consideration i.e exchange rate, gross domestic product, consumer price index, interest rate, money supply, import and export. The result of matrix correlation in table 4.2 shows that exchange rate is negatively correlated with other variables.

Table4.2: Correlation Matrix

	EXC	GDP	CPI	INT	MS	IMPORT	EXPORT
EXC	1						
GDP	-0.33123	1					
CPI	-0.06153	-0.41003	1				
INT	-0.08499	-0.05039	0.19861	1			
MS	-0.30191	0.986209	-0.36215	-0.01761	1		
IMPORT	-0.30821	0.987238	-0.38333	-0.02258	0.984294	1	
EXPORT	-0.3382	0.990572	-0.41941	-0.09015	0.967344	0.976111	1

The results show that other variables are positively correlated with one another. The correlation coefficient between exchange rate and macroeconomics variables consider is very weak below 35%.

4.3 Presentation of Results

4.3.1. Unit Root Result

For the purpose of this study, ADF and PP tests were considered simultaneously. A necessary but not sufficient condition for co integration is that each of time series must be integrated of the same order, or I(1) (Granger, 1987). It is well known that ADF tests have low power with short

time spans of data, so we also use the PP test to complement the Dickey-Fuller test by comparing the significance of statistics from both tests. A stationary series tend to be significant on Dickey-Fuller statistics and insignificant effect on PP statistics. The results of the two unit root tests, ADF and PP are summarized in Table 3 and 4, which show that the null hypothesis of non-stationarity cannot be rejected for any levels for all series.

Table 4.3: Unit Root Tests

SERIES	ADF	
	Level	1 st Difference
EXC (constant)	(-6.2601) (-3.6892)*	(-8.695 (-3.6999)*)
(Constant and linear)	(-6.3199) (-4.3240)*	(-8.4651) (-4.3393)*
LGDP (constant)	(-3.1312) (-2.9719)**	(-4.0942) (-3.6940)*
(Constant and linear)	(-0.7773) (-4.3240)	(-5.1373) (-4.3393)*
CPI (constant)	(-0.9881) (-3.7378)	(-4.5361) (-3.7379)*
(Constant and linear)	(-2.5562) (-4.4407)*	(-4.4641) (-4.3943)*
INT (constant)	(-4.3127) (-3.6892)*	(-5.8569) (-3.7115)*
(Constant and linear)	(-4.2865) (-3.5806)*	(-5.8222) (-4.3560)*
LMS (constant)	(-1.4220) (-3.7115)*	(-2.8982) (4.3560)*
(Constant and linear)	(-1.3902) (-4.3393)*	(-2.3773) (-4.3561)*
Import (constant)	(-2.9795) (-2.6251)***	(-7.4259) (-3.6998)*
(Constant and linear)	(-2.6944) (-3.2250)*	(-8.552) (-4.3393)*
Export (constant)	(-2.7860) (-2.6250)***	(5.8676) (-3.6998)*
(constant and linear)	(-2.6458) (-3.2250)***	(5.2400) (-4.3560)*

Source: Author's computation, 2015.

Table 4.4: Unit Root Tests

SERIES	PP			
	Level		1 st difference	
EXC (constant)	(-6.2282)	(-3.6892)*	(-26.7991)	(-3.6998)*
(Constant and linear)	(-6.3199)	(-4.3240)*	(-25.2442)	(-4.3393)*
LGDP (constant)	(-3.7893)	(-2.9719)*	(-4.0885)	(-3.6999)*
(Constant and linear)	(-0.4872)	(-4.3240)*	(-5.2448)	(-4.3393)*
CPI (constant)	(-2.5873)	(-2.6251)***	(-5.8958)	(-3.6998)*
(Constant and linear)	(-3.0619)	(-3.2253)***	(-5.6723)	(-4.3393)*
INT (constant)	(-4.3089)	(-3.6892)*	(-13.6719)	(-3.6999)*
(Constant and linear)	(-1.6132)	(-2.6251)*	(-14.2900)	(-4.3393)*
LMS (constant)	(-1.6398)	(-3.6892)*	(-2.8914)	(-2.6274)***
(Constant and linear)	(-0.6345)	(-3.2253)*	(-3.2741)	(-3.2292)***
Import (constant)	(-6.7290)	(-3.6892)*	(-7.4775)	(-3.6999)*
(Constant and linear)	(-2.8098)	(-3.2250)*	(-10.0410)	(-4.3393)*
Export (constant)	(-6.7290)	(-3.6890)*	(-2.5159)	(-4.3239)*
(constant and linear)	(-6,1106)	(-3.6998)*	(-16.3224)	(-4.3390)*

Source: Author's computation, 2015.

After the level order difference with the ADF and PP test, however, the null hypothesis are rejected at least at the 1% 5% and 10% significance level for all series. Thus, all the variables considered in this paper are of I (1) type. Having establish that all the series in these analysis of order one i.e I(1) series, the Johansen co integration test is use to validate whether they have a long run relationship. The result of the co integration test is as shown in the table 5 below.

4.3.2. Co-integration Test Result

Having established that all the series are $I(1)$, we advance to the co integration test. The purpose of the multivariate co integration test is to examine whether the data of time series are co integrated or not.

Table 4.5: Cointegration Test

Hp: rank = p (no deterministic trend in the data)

Hr: rank < p (co-integration relations)

Series: LEXR LGDP LCPI LINT LMS LTOT

Trace Statistics		Max-Eigen Statistics			
Hypothesized No. of CE(s)	Eigen value Ratio	Likelihood Ratio lev.	5% Sig. lev.	Likelihood	0.05 Crit.
None	0.964571	240.3283*	125.6154	90.18600*	46.23142
At most 1	0.877271	150.1423*	95.75366	56.64002*	40.07757
At most 2	0.765739	93.50229*	69.81889	39.18559*	33.87687
At most 3	0.665358	54.31670*	47.85613	29.55676*	27.58434
At most 4	0.363039	24.75994	29.79707	12.17825	21.13162
At most 5	0.266297	12.58169	15.49471	8.360594	14.26460
At most 6	0.144729	4.221092*	3.841466	4.221092*	3.841466

* denotes rejection of the hypothesis at the 5% significance level. Like-hood ratio test of both Trace and Max-Eigen indicates 5 co-integrating equation(s)

Source: Author's computation (2015).

The test results in this study are summarized in table 4.5, the results in table 4.5 shows that the null hypothesis of no co integration, can be rejected using either the maximum Eigen value or trace test statistic. They are both greater than their critical values in the case of the trace and maximum Eigen value tests. In the same way, the null hypothesis of one co integration ($r = 1$) can be rejected using the maximum Eigen value or trace test statistics. The implication of the existence of co integration is that any one variable can be targeted as a policy variable to bring about the desired changes in other variables in the system. Also, the existence of co integration implies the existence of long term causality. However, the direction of causality is not yet clear as co integration does not mean causation. To determine the direction of causation or the transmission mechanism we conduct the Granger Causality test.

4.3.3 Granger Causality Result

The result in table 4.6 shows the pairwise granger causality between exchange rate and macroeconomics variables. (Insert table 4.6 about here). The study found unidirectional causality between exchange rate (exc) and export. There was no causality found between exchange rate and all other macroeconomics variables namely gross domestic product interest rate consumer price index money supply and import.

Table 4.6 : Pairwise Granger Causality Test

Pairwise Granger Causality Tests	Lag	Observation	F-statistic	Probability
EXC does not Granger Cause LEXPORT	2	27	1.26856	0.3010
LEXPORT does not Granger Cause EXC	2	27	3.67235*	0.0421
INT does not Granger Cause LEXPORT	2	27	3.29833*	0.0559
LEXPORT does not Granger Cause INT	2	27	1.88716	0.1752
LGDP does not Granger Cause LEXPORT	2	27	6.67501*	0.0054
LEXPORT does not Granger Cause LGDP	2	27	1.37475	0.2738
LIMPORT does not Granger Cause LEXPORT	2	27	1.60529	0.2235
LEXPORT does not Granger Cause LIMPORT	2	27	0.33887	0.7162
LMS does not Granger Cause LEXPORT	2	27	1.33921	0.2826
LEXPORT does not Granger Cause LMS	2	27	1.36934	0.2751
CPI does not Granger Cause LEXPORT	2	27	2.25122**	0.1290
LEXPORT does not Granger Cause CPI	2	27	4.70971*	0.0198
INT does not Granger Cause EXC	2	27	0.44404	0.6471
EXC does not Granger Cause INT	2	27	0.66977	0.5220
LGDP does not Granger Cause EXC	2	27	2.36692	0.1172
EXC does not Granger Cause LGDP	2	27	1.59454	0.2256
LIMPORT does not Granger Cause EXC	2	27	0.51338	0.6055
EXC does not Granger Cause LIMPORT	2	27	0.35306	0.7064
LMS does not Granger Cause EXC	2	27	0.77213	0.4741
EXC does not Granger Cause LMS	2	27	0.95669	0.3996
CPI does not Granger Cause EXC	2	27	0.08482	0.9190
EXC does not Granger Cause CPI	2	27	2.23632	0.1306
LGDP does not Granger Cause INT	2	27	0.86220*	0.4360
INT does not Granger Cause LGDP	2	27	4.19882*	0.0285
LIMPORT does not Granger Cause INT	2	27	0.34992	0.7086
INT does not Granger Cause LIMPORT	2	27	4.19882*	0.0285
LMS does not Granger Cause INT	2	27	0.62234	0.5459
INT does not Granger Cause LMS	2	27	0.72962	0.4934
CPI does not Granger Cause INT	2	27	1.93092	0.1688
INT does not Granger Cause CPI	2	27	2.67637*	0.0911
LIMPORT does not Granger Cause LGDP	2	27	0.03728	0.9635
LGDP does not Granger Cause LIMPORT	2	27	1.32422	0.2864
LMS does not Granger Cause LGDP	2	27	0.69242	0.5109
LGDP does not Granger Cause LMS	2	27	1.51254	0.2424
CPI does not Granger Cause LGDP	2	27	3.99696*	0.0331
LGDP does not Granger Cause CPI	2	27	4.84267*	0.0181
LMS does not Granger Cause LIMPORT	2	27	1.18502	0.3245
LIMPORT does not Granger Cause LMS	2	27	0.63125	0.5413
CPI does not Granger Cause LIMPORT	2	27	0.74434	0.4866
LIMPORT does not Granger Cause CPI	2	27	4.64345*	0.0208
CPI does not Granger Cause LMS	2	27	1.52971	0.2388
LMS does not Granger Cause CPI	2	27	5.39690*	0.0124

Source: Author's computation (2015)

4.4 Vector Error Correction Model Result

The results of the estimated vector error correction model, using an optimal lag structure of one is as shown in table 4.7

Table4. 7 Vector error correction estimates

Cointegrating Eq:	CointEq1					
LEXC(-1)	1.000000					
LGDP(-1)	-3.983652 (0.45740) [-8.70937]					
LINT(-1)	-3.176553 (0.23585) [-13.4684]					
LMS(-1)	0.795303 (0.17715) [4.48949]					
LTOT(-1)	2.461909 (0.29043) [8.47681]					
LCPI(-1)	0.754845 (0.05720) [13.1957]					
C	39.94060					
Error Correction:	D(LEXC)	D(LGDP)	LINT)	D(LMS)	D(LTOT)	D(LCPI)
CointEq1	-0.045729 (0.12130) [-0.37698]	0.171344 (0.04510) [3.79911]	58494 (0.04515) 13266]	0.000247 (0.04517) [0.00547]	0.068587 (0.09953) [0.68910]	-0.527360 (0.42845) [-1.23087]
D(LEXC(-1))	0.145956 (0.26178) [0.55756]	0.403131 (0.09733) [4.14196]	55995 (0.09747) 14060) 10949]	0.132238 (0.09747) [1.35669]	0.464447 (0.21479) [2.16232]	1.575531 (0.92459) [1.70403]
D(LGDP(-1))	-0.383339 (0.56160) [-0.68258]	0.242803 (0.20880) [1.16284]	104279 (0.20911) 30163) 10877]	0.062448 (0.20911) [0.29864]	1.322994 (0.46080) [2.87109]	-1.694894 (1.98356) [-0.85447]
D(LINT(-1))	-0.102142 (0.38597) [-0.26464]	-0.345021 (0.14350) [-2.40429]	28828 (0.14371) 20730) 13906]	0.019798 (0.14371) [0.13776]	-0.977010 (0.31669) [-3.08507]	-0.812618 (1.36323) [-0.59610]

D(LMS(-1))	0.093653 (0.57246) [0.16360]	-0.025151 (0.21284) [-0.11817]	.12863 30747 56803	0.413048 (0.21315) [1.93782]	-0.377506 (0.46971) [-0.80370]	4.134828 (2.02191) [2.04501]
D(LTOT(-1))	-0.001451 (0.28342) [-0.00512]	-0.198952 (0.10537) [-1.88806]	188934 15222 58423	0.012423 (0.10553) [0.11772]	-0.606373 (0.23255) [-2.60755]	1.329079 (1.00102) [1.32773]
D(LCPI(-1))	0.071636 (0.07231) [0.99067]	-0.071053 (0.02689) [-2.64284]	07675 33884 19762	-0.005403 (0.02692) [-0.20068]	-0.072378 (0.05933) [-1.21989]	-0.074334 (0.25540) [-0.29105]
C	0.185598 (0.17283) [1.07387]	0.166690 (0.06426) [2.59406]	99797 39283 15236	0.090057 (0.06435) [1.39943]	0.118713 (0.14181) [0.83713]	-1.164249 (0.61043) [-1.90725]
R-squared	0.128006	0.666798	52408	0.331951	0.526760	0.504186
Adj. R-squared	-0.193255	0.544040	50663	0.085828	0.352408	0.321517
Sum sq. resids	2.048607	0.283188	90973	0.284018	1.379193	25.55600
S.E. equation	0.328362	0.122085	76363	0.122263	0.269424	1.159764
F-statistic	0.398449	5.431784	42477	1.348721	3.021249	2.760115
Log likelihood	-3.499202	23.21465	28326	23.17515	1.842225	-37.56931
Akaike AIC	0.851793	-1.127011	91353	-1.124085	0.456132	3.375505
Schwarz SC	1.235744	-0.743059	107401	-0.740133	0.840083	3.759456
Mean dependent	0.135449	0.221358	08218	0.227260	0.229605	0.001148
S.D. dependent	0.300598	0.180799	03736	0.127874	0.334800	1.407992
Determinant resid covariance (dof adj.)		2.28E-09				
Determinant resid covariance		2.77E-10				
Log likelihood		67.21580				
Akaike information criterion		-0.978948				
Schwarz criterion		1.612726				

The error correction term are of correct sign and are significant for all the equations except for exchange rate. This further suggests that there is channel of causation among the variables. As has been pointed out in the earlier studies Rasdaq 2013, individual coefficients from the error-correction model are hard to interpret in the case of vector-auto-regressive model. Consequently, the dynamic properties of the model are analyzed by examining the impulse response functions and the variance decompositions. The impulse response functions trace the dynamic responses to the effect of shock in one

variable upon itself and on all other variables i.e. it is a tool that portrays the expected path over time of the variable to shocks in the innovations. These impulse response functions are plotted in the multiple graph as shown in the figure 4.4

4.5 Impulse Responses Function

As shown in Figure4.4 a one standard deviation shock applied to exchange produces a negative effect on export both in the short run medium and in the long run. This seems to suggest that there is evidence in support of negative effect of exchange rate on export in

Nigeria. One possible reason for this could be low production activity in Nigeria over the years which in turn have effect on the export product in Nigeria. A one standard deviation shock in interest rate has effect on exchange rate in the short medium and long run. While one standard deviation shock to gross domestic product (GDP) has effect on exchange rate in the short run. However, the effect becomes negative in the third quarter in the short run and become positive in both the medium and long run.

A one standard deviation shock to import has effect on exchange rate in both short run and long run. However, the effect becomes noticeable more in the short run. A one standard deviation shock in money supply has a negative effect on exchange rate in both short run and long run. A one standard deviation shock to consumer price index has negative effect on exchange rate in the short, medium and long run.

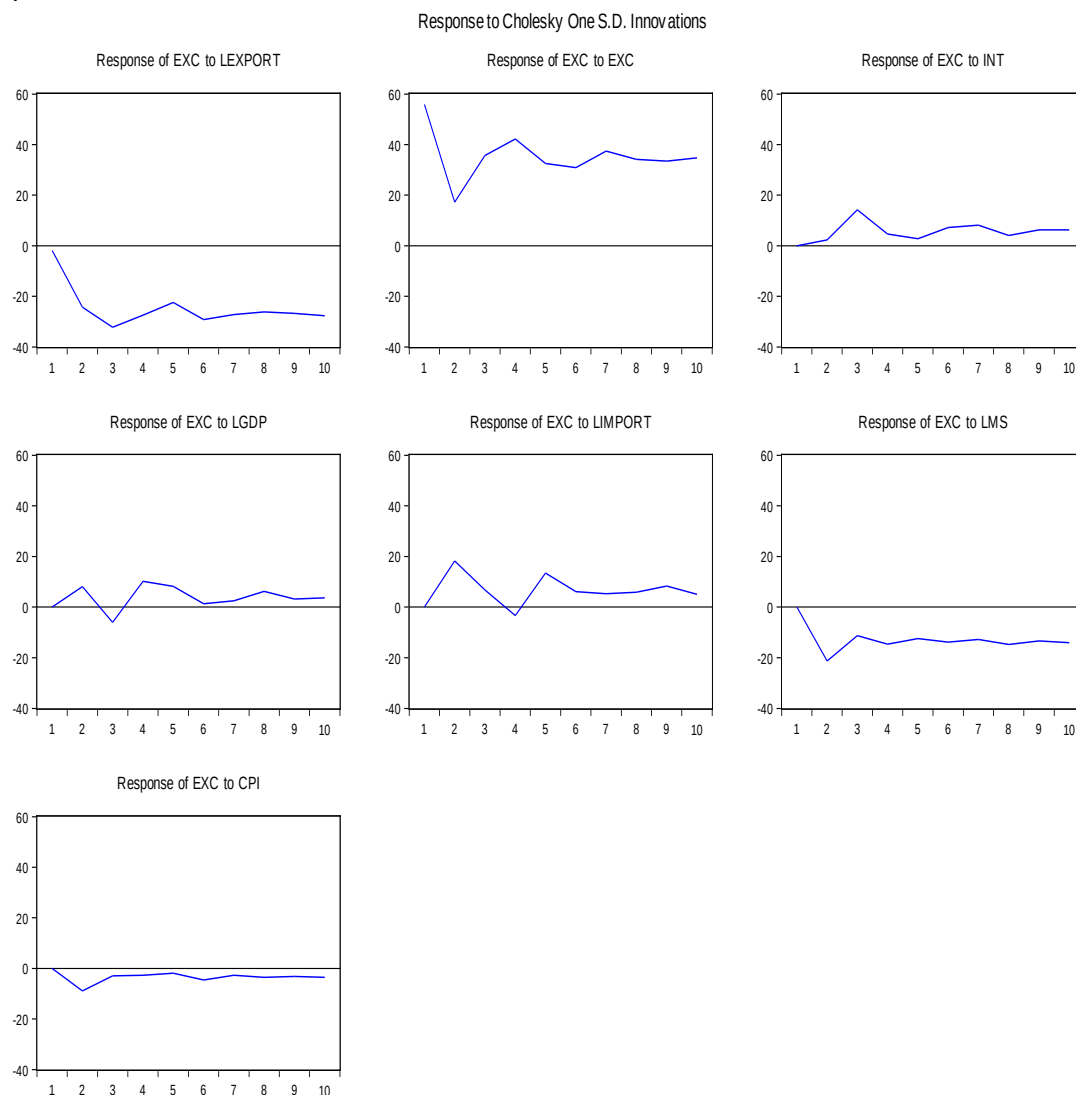


Figure 4. 4: Impulse response function

As impulse response functions will not show the magnitude of the effect of the variables on exchange rate, we therefore analyze the variance decompositions. The VDCs indicate the proportion of the forecast error in a given variable that is accounted for by innovations in each endogenous variable. The results of the variance decompositions are as shown in table4.8

4.6 Variance Decomposition

The results of the variance decompositions are as shown in table 4.8. It shows that most of the variables accounted for less than ten percent variation in exchange rate. The results show that most of the variables namely gross domestic product, interest rate, money supply, inflation, imports and exports had no significant impact on exchange rate. The proportions explained by these variables are very low.

Table4.8: Variance Decomposition of LEXC

S.E.	LEXPORT	EXC	INT	LGDP	LIMPORT	LMS	CPI
0.322417	0.121474	99.87853	0.000000	0.000000	0.000000	0.000000	0.000000
0.592567	12.00100	69.11197	0.112177	1.302241	6.681870	9.191612	1.599133
0.764183	21.28959	61.06249	2.716474	1.318136	4.906755	7.565396	1.141160
0.899839	22.55944	61.21666	2.175093	1.947433	3.672375	7.529854	0.899140
1.042246	23.01524	60.03400	1.892898	2.171766	4.528036	7.570191	0.787872
1.164051	25.51286	57.91545	1.974795	1.870379	4.128503	7.781441	0.816571
1.269847	26.25193	57.92153	2.087981	1.643287	3.705503	7.644661	0.745109
1.370715	26.84109	57.45286	1.938885	1.659054	3.468087	7.912552	0.727467
1.467054	27.50982	56.91834	1.927700	1.540250	3.442474	7.959935	0.701474
1.555078	28.12423	56.57508	1.909551	1.448128	3.219504	8.034741	0.688763

Source: Author computation (2015)

4.7 Discussion

The result of the correlation shows that exchange rate is negatively correlated with other variables and that other variables are positively correlated with one another. Even though the correlation coefficient between exchange rate and macroeconomic variables consider is very weak below 35 percent. The result of the ADF and PP unit root test shows that all variables are stationary at first difference. Result of granger causality between exchange rate and macroeconomic variables found that a unidirectional causality exists between exchange rate and export but no causality exist between exchange rate and other macroeconomic variables. The error

correction term are correctly sign and are significant for all equation except exchange rate. This further suggests that there is a channel of causation among the variables. The impulse response function provide evidence in support negative effect of exchange rate on export in Nigeria, money supply and inflation, a negative effect on GDP in the short run but a positive effect in the long run. To show the magnitude of the effect on exchange rate, the variance decomposition shows that none of the variables had an impact on exchange rate both in the short run and long run. As most of the variables account for less than 10 percent variation in exchange rate.

The result reveal a long run relationship between exchange rate and macroeconomics variables in Nigeria and that exchange rate volatility does granger causes some macroeconomics variables in Nigeria. This finding is however in agreement with the finding of Oguzhan *et al* (2011) Chi-wei-su (2012), and Sarbapriya Ray (2012).The Vector error correction model, the impulse response and variance decomposition results shows that exchange rate volatility shocks respond to macroeconomic variables in the economy. This finding is in line with the study of Akinlo and Lawal (2015). The economic implication of the study is that incessant changes in the exchange rate may be as a result of changes in macroeconomics variables such as gross domestic product, consumer price index proxy for inflation, interest rate, money supply, import and export. These macroeconomic variables could have long term effect on exchange rate changes in Nigeria. This, therefore, suggests that the macroeconomic variables are crucial to mitigate incessant exchange rate changes in Nigeria.

5.0 Conclusion

The effect of exchange rate on macroeconomic variables in developed, developing and Nigeria cannot be over emphasized. It has long been of great concern for both academics and policy makers. Whether exchange rate volatility affects macroeconomic variables has become topical

issue in Nigeria following recent very high fluctuation in Naira exchange rate. Several studies have been conducted to investigate the effect of exchange rate volatility and macroeconomic variables but the empirical evidence from literature has therefore been inconclusive. This paper therefore examines the impact of exchange rate fluctuations on macroeconomic variables in Nigeria employing a disaggregated period analysis of four period from Structural Adjustment Programme period (SAP), post SAP period, the National Economic Empowerment and Development period (NEEDS) and Global economic and financial crises period to capture the impact of exchange rate fluctuations on macroeconomic variables in Nigeria and a six variables VAR model was developed. The result reveals a long run relationship between exchange rate and macroeconomic variables in Nigeria and that exchange rate behavior do granger cause some macroeconomic variables in Nigeria.

The result therefore suggests that more foreign exchange should be made available to reduce gap between the supply and demand for exchange rate thereby enhancing the value of domestic currency. More loans should also be made available so as to enhance the production which will impact on the total trade of the economy. Policy makers should be acquainted of these macroeconomic effects on exchange rate and make their decisions in a more efficient and precise manner.

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