EXCHANGE RATE VOLATILITY AND TRADE FLOW TO NIGERIA: NEW EVIDENCE FROM AN AR-EGARCH AND LA-VAR MODELS

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Abstract

This study investigated the impact of exchange rate volatility on trade flow in Nigeria. Applying the AR(2)-EGARCH(1, 1) and LA-VAR(3) models on quarterly data for the period of 1986 – 2012, the study revealed that there is no instantaneous relationship between trade flows and exchange rate volatility in Nigeria but that exchange rate volatility explained more of the variability in trade flow and vice versa. Therefore it was recommended that policy measures be put in place to ensure exchange rate stability in Nigeria. Output expansion and export promotion should be given their pride of place.

Key Words: Exchange Rate, Trade Flow, Nigeria, Ar-Egarch Model, La-Var Model

Introduction

There is a widespread contention that volatility of the exchange rates is one of the main sources of economic instability in Nigeria. The impact of the global economy on emerging economies like Nigeria is driven significantly by swings in the currencies of the major economic powers like United State. In recent years, these swings have been enormous, volatile and frequently affecting economic fundamentals in the country such as trade (Philippe *et al.*, 2006). This has prompted monetary authorities in Nigeria to keep close trade ties with the developed nations in order to intervene on such economic issues, without any clear sense of a sustainable equilibrium. Such exchange rate stability intervention typically comes too late to prevent severe currency misalignment and volatility. These imbalances, in turn, trigger major economic distortions, protectionist trade pressures, and inevitably sharp currency reversals. Currency instability and volatility could only exist during flexible exchange rate regime where the foreign exchange rate is determined by the forces of demand and supply.

The liberalization of capital flows in Nigeria over the last three decades and the enormous increase in the scale and variety of foreign financial transactions have clearly increased the magnitude of exchange rate movements in the country, given the underdeveloped nature of the capital market. Currency crises in the economy, which became more frequent in the last three decades, are especially notable cases of large exchange rate volatility (Yinusa&Akinlo, 2003). This has been of particular concern to monetary institutions in the nation. Empirical evidence have shown that exchange rate volatility is caused by both real and financial aggregate shocks like inflation. In spite the perceived implications of a stable exchange rate to lead to long- run growth and economic stability, the existing empirical literature on Nigeria (considering the level of the country's economic integration through trade and foreign capital inflows) offers little guidance. Since trade is an inevitable aspect of the Nigerian economy, given the level of her reliance on imports and the income it receives from export, it becomes imperative to look at how exchange rate volatility will affect her trade relations.

Literature Review

(a) Theories of Exchange Rate Determination

In this part we look at some existing theories that explain the determination of exchange rate. It is clear that not all the theories that are actually used are suitable for forecasting the movement of exchange rate. Some may be better than others. Thus, it is important we analyze the various theories of exchange rates determination to choose or create a better model with macro foundations for an empirical study.

(b) Purchasing Power Parity (PPP) Theory

The PPP theory can be traced back to sixteen-century Spain and early seventeenth century England, but Swedish economist Cassel (1918) was the first to name the theory PPP. Cassel once argued that without it, there would be no meaningful way to discuss over-or-under valuation of a currency. Under this model,

let iP = the price level of good i in the home currency and $*iP$ = the price level of good i in the foreign currency. Letter “S” denotes the nominal exchange rate that expresses the price in foreign currency in terms of the domestic currency. According to the law of “one price,” the price of one good should be equal at home and abroad, say, $*iP=iP=S$. If the prices of each good are equalized between the two countries and if the goods baskets and their weights in the two countries are the same, then, the absolute PPP holds. In other words, the purchasing power parity exchange rate is the exchange rate between two currencies which would enable exactly the same basket of goods to be purchased. The purchasing power will be the same in both countries. For example, say a basket of goods cost \$50 in the USA, and the same basket cost N5, 825 in Nigeria. The PPP rate between the Naira N and the \$ would then be $\$1 = N116$.

This theory is further expressed in absolute and relative terms. Absolute PPP is generally viewed as a condition of goods market equilibrium. Under absolute PPP, both the home and foreign market are integrated into a single market. Absolute PPP is built on the assumption of a perfect market setting with high information efficiency in both foreign exchange and goods markets, allowing for no transport costs, tariffs and trade barriers. On the other hand, relative PPP can be derived by assuming that transaction costs are proportionately related to price level. If an economy adopts a fixed exchange rate regime, the relative PPP model forecasts that the home prices change at the same speed as foreign prices.

(c) Interest Rate Parity Theory

The interest rate parity condition was developed by Keynes (1923), to link the exchange rate, interest rate and inflation. Interest rate parity, examines how the exchange rates are determined in financial markets. Since interest rates change frequently in the short run, interest rate parity is thought of as “short run exchange rate theory.” As early as the period of the gold standard, monetary policymakers found that exchange rates were influenced by changes in monetary

policy. The rise of the home interest rate is usually followed by the appreciation of the home currency, and a fall in the home interest rate is followed by a depreciation of the home currency. This indicates that the price of assets plays a role in exchange rate variations. The theory also has two forms: covered interest rate parity (CIRP) and uncovered interest rate parity (UCIRP). CIRP describes the relationship of the spot market and forward market exchange rates with interest rates on bonds in two economies. UCIRP describes the relationship of the spot and expected exchange rate with nominal interest rates on bonds in two economies.

(d) The Mundell-Fleming Model

The Mundell-Fleming model is developed by extending the IS-LM model to the case of an open economy, and thus provides understanding of how the exchange rate is determined. The IS-LM model considers three markets: goods, money and assets, and is mainly used to analyze the impacts of monetary policy and fiscal policy. When the goods market is not in full employment equilibrium level, it shows how to use fiscal policy and monetary policy to adjust an economy to new full employment equilibrium. Since only two of the three markets are independent, the IS-LM model only establishes a linkage between the money market and goods market. In the Mundell-Fleming model, the balance of international payments (exchange rate) is considered as another equilibrium condition in addition to the money market and goods market. The model states that perfect capital mobility, monetary policy independence and a fixed exchange rate regime cannot be achieved simultaneously. Specifically, it argues that a country cannot sustain monetary policy independence in a fixed exchange rate regime with perfect capital mobility. However, this argument is made in a small country setting, and it is not necessarily true in a bigger economy.

The volatility of exchange rates is the source of exchange rates risk and has certain implications on the volume of international trade, consequently on the balance of payments. Theoretical analyses of the relationship between higher exchange-rate volatility and international trade transactions was also conducted by Hooper and Kohlhagen (1978) and some other economists. The argument is as follows: Higher exchange-rate volatility leads to higher cost for risk-averse traders and to less foreign trade. This is because the exchange *rate* is agreed on at the time of the trade contract, but payment is not made until the future delivery actually takes place. If changes in exchange rates become unpredictable, this creates uncertainty about the profits to be made and, hence, reduces the benefits of international trade. Exchange-rate risk for the country is generally not hedged because forward markets are not accessible to all traders. Even if hedging in the forward markets were possible, there are limitations and costs. For example, the size of the contracts is generally large, the maturity is relatively short, and it is difficult to plan the magnitude and timing of all international transactions to take advantage of the forward markets. On the other hand, recent theoretical developments suggest that there are situations in which the volatility of exchange rates could be expected to have either negative or positive effects on trade volume. De Grauwe (1988) stressed that the dominance of income effects over substitution effects can lead to a positive relationship between trade and exchange-rate volatility. This is because, if exporters are sufficiently risk averse, an increase in exchange-rate volatility raises the expected marginal utility of export revenue and therefore induces them to increase

exports. De Grauwe suggested that the effects of exchange-rate uncertainty on exports should depend on the degree of risk aversion. Recently, theoretical models of hysteresis in international trade have shown that increased uncertainty from high volatility in exchange rates can also influence foreign trade, in particular if significant sunk costs are involved in international transactions. It is difficult, however, to identify how trade will be affected. The study is anchored on the purchasing power parity theory and the interest rate parity theory of exchange rate determination as it best explains the research study.

Empirical Review

In spite of many empirical studies that have been carried on the subject, the impact of exchange volatility of macroeconomic variables remains ambiguous. Many theoretical modeling studies on the effect of exchange rate volatility showed a negative relationship of exchange rate volatility on macroeconomics variables.

According to Clark et al (2004) robust findings in early works may be caused by several reasons ranging from, first, theoretical consideration, that is, the theoretical background do not provide a clear support for the conventional assumption that exchange rate volatility has a negative impact on the level of trade. Second, the sample period over which exchange rate should signify variation was relatively short. And finally, the specification of the estimating equation was typically rather crude, consisting of a few macro variables from standard trade equations in use at the time. To this end we will look at some domestic and foreign literatures previously done concerning this study.

Evidence from Nigeria

In Nigeria (and Africa), studies have been conducted to estimate exchange rate volatility. Most of the studies on exchange rate volatility in Nigeria measure the impacts of exchange rate volatility on trade balance with little attention to other internal macroeconomic variable shocks. For instance, Akpokodje (2009) explored the exports and imports effects of exchange rate volatility with specific reference to the non-CommunauteFinanciereAfricaine (non-CFA) countries of Africa during the period, 1986 – 2006. The countries chosen included Ghana, Lesotho, Malawi, Nigeria, Sierra Leone, South Africa, Uganda and Zambia. A GARCH approach was employed to generate on annual basis the real exchange rate volatility series for each country. The study reveals a negative effect of exchange rate volatility on exports and imports in the selected African countries. The adverse effect of exchange rate volatility on exports in the sampled countries, as found in the study suggests the need for policy interventions that will help to minimize and, where possible, eradicate exchange rate volatility. Yinusa (2008) investigated the relationship between nominal exchange rate volatility and dollarization in Nigeria by applying Granger causality test for the period 1986–2003 using quarterly data. The study reported a bi-causality between them but the causality from dollarization to exchange rate volatility appears stronger and dominates. He however concluded that policies that aim to reduce exchange rate volatility in Nigeria must include measures that specifically address the issue of dollarization. But, the exact measure of exchange rate volatility in the study was not reported.

In the same vein, Ogunleye (2009) investigated the relationship between exchange rate volatility and Foreign Direct Investments (FDI) inflows in Sub-Saharan Africa using Nigeria and South Africa as case studies. By endogenizing exchange rate volatility, the study uses a two-stage Least Squares methodology. The study finds that in Nigeria, there is a statistically significant relationship between the variables, with exchange rate volatility retarding trade inflows and trade inflows increasing exchange rate volatility. As revealed by the study, this relationship is however weak for South Africa. The possible reason adduced by the study is the sound capital flow management policy of the South African Reserve Bank.

Further attempts were made by Aliyu (2009a) and he employed standard deviation measure of exchange rate volatility based quarterly observation and further assesses the impact of exchange rate volatility on non-oil export flows in Nigeria between 1986 and 2006. Empirical result revealed that exchange rate volatility decreased non-oil exports in Nigeria.

In another study, Aliyu (2009b) examined the impact of oil price shock and exchange rate volatility on economic growth in Nigeria and measuring exchange rate volatility as the consumer price index based real exchange rate approach. But he failed to examine the degree and persistency of exchange rate volatility using standardized econometric.

Evidence from the rest of the World

Dornbusch (1989) examine the differences in exchange rate volatility between developing and industrialized countries. He identified the fact that volatility is higher in developing countries, when compared to industrialized countries. The author further identified three times higher volatility in developing countries than in industrialized countries, but failed to explain explicitly why such differences in volatility between the industrialized countries and developing countries exist. In the work of Koren and Szeidl (2003) using disaggregated data founds small effects, and eliminating exchange rate volatility would result in a change in export prices of only a few percentage points. Bernardina (2004) investigates impacts of the real exchange rate, real non-oil GDP, and the world income on Russian non-oil export by using an Error Correction Model over the period 1994-2001. Author finds that there is a robust and negative long run cointegration relationship between the real exchange rate and Russian non-oil exports. Furthermore, the world income has positive effect on Russian non-oil export while real non-oil GDP causes a decline in non-oil export.

Another study relating to Iranian non-oil export comes from Sabuhi and Piri 2008; Abolagba et. al, 2010. They explore the effects of exchange rate, export volume, domestic saffron production on price of saffron, Iran's major non-oil export good in the short and long-run. Employing Autoregressive Distributed Lag (ARDL) model shows that appreciating exchange rate has statistically significant negative impact on export price of saffron while there is no significant relationship between export price and domestic production of Saffron in the long-run. Arize et al (2000) in their study, they examine the exchange rate volatility on the exports of 13 less developed countries with quarterly data series for the period 1973-1996. They employed Johansen's Multivariate procedure and Error Correction Model to investigate both the long-run relationship and short-run dynamics explicitly; their result shows a significant negative effect of volatility on export flows. Broda, (2004) investigate with the help of panel data of 75

countries for the period of 1973-1996, employing VAR model. The findings show the presence of substantial shocks to terms of trade and real GDP in the short-term. The result further confirms the negative shocks, resulting in larger exchange rate changes in countries that adopted flexible exchange rate. Despite the huge body of literature on exchange rate volatility and trade, there is, however, no consensus on the appropriate method for measuring such volatility. There is no generally accepted model of firm behaviour subject to risk arising from fluctuations in exchange rates and other variables. Consequently theory cannot provide definitive guidance as to which measure is most suitable. Moreover, the scope of the analysis will to some extent dictate the type of measure used.

Data and Methodology

(a) Method and Sources of Data

The method of data collection that is used in this research is the secondary method- That is, data that has already been collected by another researcher. These data will be collected from a reliable and credible source, as the obtained data plays a crucial role in verifying the credibility and accuracy of results in this research. Therefore, the data are sourced from various issues of Annual Reports and Statement of Accounts; Statistical Bulletin published by the Central Bank of Nigeria, and the National Bureau of Statistics, Nigeria.

(b) Model Specification

To achieve the objectives of study a step by step estimation approach was employed. First the AR-EGARCH model was estimated to examine exchange rate for volatility. The EGARCH model was developed by Nelson (1991) to capture the effect of information asymmetries on market returns and volatility, and also to ensure that the conditional variance is always positive. Assuming y_t follows an autoregressive process of order k the mean equation is specified as:

$$y_t = \beta_0 + \sum_{i=1}^k \beta_i y_{t-i} + \varepsilon_t \quad . . . \quad (3.1a)$$

The complete model will include the following variance equation:

$$\log \sigma_t^2 = \varphi + \sum_{i=1}^q \alpha_i \log \sigma_{t-i}^2 + \sum_{i=1}^p \beta_i \left| \frac{\varepsilon_{t-i}}{\sigma_{t-i}} \right| + \sum_{k=1}^r \gamma_k \left(\frac{\varepsilon_{t-k}}{\sigma_{t-k}} \right) \quad . . . \quad (3.1b)$$

The left-hand of equation 3.1b is the logarithm of the conditional variance. The logarithmic form of the EGARCH (p, q) model certifies the non-negativity of the conditional variance without the need to constrain the model's coefficients. The asymmetric effect of positive and negative shocks (information) is represented by the inclusion of the term $\varepsilon_{t-i}/\sigma_{t-i}$. If

$\gamma_k > 0$ (< 0) volatility tends to rise (fall) when the lagged standardized shock, $\varepsilon_{t-1}/\sigma_{t-1}$ is positive (negative). The persistence of volatility to the conditional variance is given by $\sum_{i=1}^q \alpha_i$.

We may consider a special case EGARCH(1,1) model as follows:

$$\log \sigma_t^2 = \varphi + \alpha \log \sigma_{t-1}^2 + \beta \left| \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \right| + \gamma \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \quad . . . \quad (3.2)$$

For a positive shock, $\varepsilon_{t-1}/\sigma_{t-1} > 0$ eqn. (3.2) becomes:

$$\log \sigma_t^2 = \varphi + \alpha \log \sigma_{t-1}^2 + (\beta + \gamma) \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \quad . . . \quad (3.3)$$

and for negative shocks, $\varepsilon_{t-1}/\sigma_{t-1} < 0$ it becomes:

$$\log \sigma_t^2 = \varphi + \alpha \log \sigma_{t-1}^2 + (\beta - \gamma) \frac{\varepsilon_{t-1}}{\sigma_{t-1}} \quad . . . \quad (3.4)$$

Therefore the presence of a leverage effect can be tested by the hypothesis $\gamma=0$. There is an asymmetric effect if $\gamma \neq 0$. Furthermore, the parameter α governs the persistence of volatility shocks for the EGARCH (1, 1) model. The benefits in using the EGARCH model are: (i) Since the logarithm of volatility is used as the regressand, imposing nonnegative constraint on the parameters of variance dynamics is no longer necessary; (ii) the EGARCH model takes into consideration the asymmetric effect of volatility; and (iii) only the coefficients of the GARCH term determines the persistence of volatility shocks. Thus, this paper will provide empirical evidence regarding the asymmetries of volatility in the Nigerian Naira's exchange rate. Second, the study examined the nexus between exchange rate volatility and trade flow in Nigeria the study adopted the Lag Augmented Vector Autoregressive (LA-VAR) model. This model was developed by Toda and Yamamoto (1995) and adopted by Oseni and Nwosa (2011) to examine the link between stock market volatility and macroeconomic variables volatility in Nigeria, and Karimo and Tobi (2013) to examine the link between foreign portfolio investment volatility and macroeconomic uncertainty in Nigeria alongside the Exponential GARCH model. The basic strength of the model is its ability to test for causality among variables without paying attention to the stochastic process generating the time series. That is it could be applied even when the order of integration or cointegration is not known.

The model is specified as follows:

$$x_t = \alpha_0 + \alpha_1 t + \theta_1 x_{t-1} + \theta_2 x_{t-2} + \dots + \theta_k x_{t-k} + \varepsilon_t \quad . . . \quad (3.5)$$

where: x_t is a 2-dimensional exchange rate volatility and total trade flow vector; ε_t is a 2-dimensional vector of random error terms with zero mean and variance covariance matrix $\sum \varepsilon$; t is time trend; k is the lag length which would be determined empirically; and $\alpha_0, \alpha_1, \theta_i$ are vectors of coefficients to be estimated.

The null hypothesis that the θ_{th} variable does not granger-cause the i th variable is tested using the formulation in eqn.(3.6) below.

$$\theta_{ij}(1) = \theta_{ij}(2) = \dots = \theta_{ij}(k) = 0 \quad . \quad . \quad . \quad (3.6)$$

where $\theta_{ij}(h)$ is the (i, j) th element of the matrix $\theta_{ij}(h=1,2,3,\dots,k)$. we estimated a VAR model formulated at levels using the classical OLS regression to test the above hypothesis. The Toda and Yamamoto (1995) formulation established that the Wald statistic asymptotically follows a chi-square distribution with degrees of freedom equal to the number of excluded lagged variables without paying attention to the time series properties of stationarity and or cointegrating processes.

Estimation Results and Discussion

The mean equation of the exchange rate was tested for ARCH effects using the ARCH LM test. The results presented on table 1 showed ARCH effect up to the sixth order, indicating the presence of volatility persistence in Naira-US Dollar exchange rate. Results of the EGARCH model is presented on table 2. The first component is the mean equation. It indicates the Naira exchange rate follows an AR(2) process, that is, the effect a shock in the current quarter persists up to the next two quarters. This implies that the effect of a stochastic shock in a current quarter is carried over to the next two quarters. To put it differently, it implies that market returns are affected by innovations in the market and that this effect lasts up to the next two quarters. The results of the variance equation showed that only the EGARCH coefficient, C(7) was statistically significant. The asymmetric information shock was statistically not significant, indicating that the naira exchange rate volatility does not respond differently to good (bad) news. This is in contrast to the widely held view that bad news has more impact on exchange rate volatility than good news. Overall, these results showed that the Naira exchange rate follows an AR(2)-EGARCH(1,1) process. The LA-VAR model became stable at order three (3) as revealed on table 3, thus, the granger causality, impulse response and the variance decomposition results presented on tables 5, 6 and 7, respectively are those of LA-VAR(3).

The granger causality results showed independence between total trade and the exchange rate indicating that there is no instantaneous relationship between exchange rate and rate in Nigeria. Results from the impulse response function showed that the responsiveness of trade volumes to exchange rate volatility was high (171.76 structural shock) in first the forecast horizon decline rapidly and eventually dissipated and even became negative in the tenth horizon. Results from the Variance decomposition showed that exchange rate volatility explained more of the shocks in trade volumes in Nigeria. Exchange rate volatility explained 88 percent of the shocks in trade volume in the first horizon. Though its explanatory power increased slowly and was able to explain 90.5 percent of shocks in trade volumes in the 4th horizon, this was not sustained as its explanatory power declined to 85.9 percent in the 10th horizon. Shocks in trade volumes explained more of the volatility in exchange rate 98.3 percent in the first horizon and 97.2 percent in the tenth.

Table1: Test for ARCH(1) effects in the Exchange rate

ARCH Test:

F-statistic	18.65581	Probability	0.000000
Obs*R-squared	54.89804	Probability	0.000000

Test Equation:

Dependent Variable: RESID^2

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.312065	2.114628	2.039160	0.0442
RESID^2(-1)	0.763972	0.100247	7.620860	0.0000
RESID^2(-2)	-0.015363	0.125561	-0.122359	0.9029
RESID^2(-3)	-0.047362	0.122318	-0.387207	0.6995
RESID^2(-4)	-0.245450	0.120554	-2.036024	0.0446
RESID^2(-5)	0.187320	0.123042	1.522407	0.1313
RESID^2(-6)	-0.059154	0.089678	-0.659631	0.5111
R-squared	0.543545	Mean dependent var		10.79398
Adjusted R-squared	0.514410	S.D. dependent var		25.87774
S.E. of regression	18.03273	Akaike info criterion		8.689042
Sum squared resid	30566.86	Schwarz criterion		8.870288
Log likelihood	-431.7966	F-statistic		18.65581
Durbin-Watson stat	2.079649	Prob(F-statistic)		0.000000

Source: Author's computation

Table 2: AR(2) – EGARCH(1, 1) Model Estimation Results

$$\text{LOG}(\text{GARCH}) = \text{C}(4) + \text{C}(5) * \text{ABS}(\text{RESID}(-1) / @ \text{SQRT}(\text{GARCH}(-1))) + \text{C}(6)$$

$$* \text{RESID}(-1) / @ \text{SQRT}(\text{GARCH}(-1)) + \text{C}(7) * \text{LOG}(\text{GARCH}(-1))$$

EXR	Coefficient	Std. Error	z-Statistic	Prob.
C	101.1243	56.06400	1.803730	0.0713
AR(1)	1.639542	0.072685	22.55692	0.0000
AR(2)	-0.646921	0.072104	-8.972103	0.0000
Variance Equation				
C(4)	0.308269	0.362898	0.849465	0.3956
C(5)	0.312310	0.273121	1.143485	0.2528
C(6)	-0.069301	0.112900	-0.613827	0.5393
C(7)	0.677106	0.300640	2.252217	0.0243
R-squared	0.996968	Mean dependent var		55.92998
Adjusted R-squared	0.996907	S.D. dependent var		41.95348
S.E. of regression	2.333214	Akaike info criterion		4.536360
Sum squared resid	544.3888	Schwarz criterion		4.715419
Log likelihood	-226.6225	Hannan-Quinn criter.		4.608885
Durbin-Watson stat	1.631729			

Inverted AR Roots .98 .66

Source: Author's computation

Table 3: Roots of Characteristic Polynomial

Root	Modulus
0.990886	0.990886
0.986306	0.986306
0.632838	0.632838
0.536576	0.536576
0.240558 - 0.061926i	0.248401
0.240558 + 0.061926i	0.248401

No root lies outside the unit circle.

VAR satisfies the stability condition.

Source: Author's computation

Table 4: VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: TRF)			
Excluded	Chi-sq	df	Prob.
EXR	3.641723	3	0.3028
All	3.641723	3	0.3028
Dependent variable: EXR			
Excluded	Chi-sq	df	Prob.
EXR	0.352709	3	0.9498
All	0.352709	3	0.9498

Source: Author's computation

Table 5: Impulse Response function

Period	Response of D(TRF):	
	TRF	FX
1	62.80599	171.6711
2	45.71990	140.9651
3	33.01979	115.8473
4	-3.563385	74.14775
5	-25.32535	43.76262
6	-37.08956	21.91465
7	-35.71134	8.172560
8	-27.85880	0.026178
9	-17.57754	-4.327531
10	-8.439293	-6.106161
Response of EXR:		
Period	TRF	FX
1	-2.266162	0.297025
2	-1.756066	0.282825
3	-1.361652	0.262719
4	-0.712868	0.092064
5	-0.291243	-0.033892
6	-0.026276	-0.123733
7	0.089965	-0.148138
8	0.123189	-0.132865
9	0.113840	-0.095798
10	0.089279	-0.056130
Factorization: Structural		

Source: Author's computation

Table 5: Impulse Response function

Variance Decomposition of TRF:			
Period	S.E.	TRF	EXR
1	182.7992	11.80466	88.19534
2	235.3232	10.89784	89.10216
3	264.3633	10.19519	89.80481
4	274.5879	9.466904	90.53310
5	279.2043	9.979184	90.02082
6	282.5083	11.47075	88.52925
7	284.8737	12.85252	87.14748
8	286.2327	13.67807	86.32193
9	286.8045	13.99920	86.00080
10	286.9937	14.06722	85.93278

Variance Decomposition of EXR:			
Period	S.E.	TRF	FX
1	2.285545	98.31109	1.688908
2	2.896114	97.99446	2.005536
3	3.211011	97.69911	2.300887
4	3.290479	97.73062	2.269375
5	3.303516	97.73798	2.262023
6	3.305937	97.60121	2.398793
7	3.310477	97.40754	2.592458
8	3.315432	97.25469	2.745314
9	3.318769	97.17688	2.823118
10	3.320444	97.15115	2.848846

Factorization: Structural			
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Source: Author's computation

Conclusion and Recommendations

The conclusion that can be drawn from this study is that the Naira exchange rate is volatile as expected however both positive (good) and negative (bad) information have the same and equal effect on exchange rate fluctuations in Nigeria, which is in contrast to the widely held view that bad news has more impact on exchange rate volatility than good news. Though, there is no short-run relationship between exchange rate volatility and trade flows in Nigeria the long-run responsiveness of trade volumes to exchange rate volatility was high. Also, exchange rate volatility explained more of the shocks in trade volumes in Nigeria and Shocks in trade volumes explained more of the volatility in exchange rate.

The following recommendations are made:

- In as much as the exchange rate should not be predictable a more stable exchange rate regime is important for a stable economy. Efforts should therefore be made towards ensuring exchange rate stability.
- Efforts towards ensuring exchange rate stability should include increased productivity and sound export promotion policy.
- The Central Bank should ensure effective management of the foreign exchange market to watch the activities of dealers in the market, by ensuring that dealers are not involve in round-tripping and foreign exchange are used for the purpose of which they are meant for.

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