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Real Exchange Rate Volatility, Economic Growth and International Trade in an Emerging Market Economy: Evidence from Nigeria

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Abstract
This study examined the long-run and short-run impacts of real exchange rate volatility and the level of economic growth on international trade in Nigeria using a vector error correction model on time series annual data from 1971 to 2012. The results revealed that in both short-run and long-run, exports and imports were chiefly influenced by real exchange rate, real exchange rate volatility, foreign income, gross domestic product, terms of trade and changes in exchange rate policies. The findings further revealed that exchange rate volatility depressed exports and imports in the long-run. The result from pair wise Granger causality test revealed unidirectional causality running from export to exchange rate volatility and from exchange rate volatility to import and a unidirectional causality flow from RGDP to imports and exports. This is an indication of poor performance of the export sector and the over dependence of the country on imported goods. The statistical significance of both real foreign income and real gross domestic product were indications that tariff measures would be ineffective and as a result the study believed that effective import substitution industrialization would significantly reduce pressure on the external sector and will actually increase economic activities and hence economic growth The study recommends the use of supportive fiscal and monetary policies that will provide a set of incentives aimed at removing anti-export bias barriers so as to promote exports, particularly non-oil exports and discourage import of consumer goods to stabilize the foreign exchange rate.
Keywords: Real Exchange Rate Volatility, International Trade, Economic Growth, Granger Causality.

1.0 Introduction

There has been a gradual global transformation of monetary systems since the breakdown of Bretton Wood fixed exchange rate system in the early 1970s. Many countries are shifting away from the conventional fixed exchange rate regime to a more flexible and floating exchange rate regime creating room for more exchange rate uncertainty. Although there is a growing body of literature on the impact of exchange rate volatility and economic growth on international trade, empirical evidence has been ambiguous both within developed and developing countries like

Nigeria and across countries (Mckenzie, 1999; Jeong, 2000; Clark *et al.,* 2004; Chit, 2008 and Odili, 2014). Many empirical findings supported the hypothesis that an increase in exchange rate volatility leads to a decrease in international trade flows and a fall in the level economic growth because in most international transactions, goods are denominated in terms of the currency of either the exporting or importing country. Therefore, unanticipated variation in the exchange rate and its volatility should adversely affect international trade flows and economic growth through the effects on profits. There are also evidences on the relationship between exchange rate volatility, international trade and economic growth, which suggest that exchange rate volatility has positive impact on trade balance and the economy in general. Given such contradictions, the debate on the impact of exchange rate volatility on international trade and economic growth remains inconclusive.

Theoretically, an ambiguous relationship is predicted as exchange rate volatility can either stimulate or depress trade (Cote, 1994; Odili, 2014). From a policy point of view, evidence of exchange rate uncertainty adversely affect trade balance especially in developing countries due to lack of hedging instruments which may compel governments to intervene in foreign currency markets. This is done in order to stabilize exchange rates as severe fluctuations in currencies can potentially affect the design of appropriate trade policies and thus undermine the achievement of specific economic goals such as export promotion and economic growth (Arize *et al.,*2000; Choudhry, 2005). The major policy thrusts of the Nigerian exchange rate system and trade policies, include, integrating the economy into the global market system, liberalization of trade and exchange rates to enhance competeviness of domestic industries, effective participation in trade negotiations to harness the benefits in the multilateral trading system, adoption of appropriate technology and support of regional integration and co-operation.

International trade in Nigeria therefore reflected the sequence of the various exchange rate and trade policies employed over time. The unabated problems of exchange rate uncertainty, the fall in price of crude oil and the attendant economic depression, heralded the introduction of structural Adjustment programme (SAP) in 1986. As a result, trade and exchange rate policies were liberalized. The main objectives of the new exchange rate policy under the SAP were to preserve the value of the domestic currency, reduce government intervention in the foreign exchange market, maintain a favourable external reserve position and ensure external balance without compromising the need for internal balance and the overall goal of macroeconomic stability (Obiora and Igue, 2006; Odili, 2014). This development caused persistent exchange rate volatility, which yielded persistent naira depreciation over the years.

Research work on exchange rate volatility- international trade and economic growth nexus in Nigeria is scanty. Relevant research does not suggest a clear-cut relationship between exchange rate volatility, international trade and economic growth in Nigeria. This may be due, for example, to the lack of commodity disaggregation in most studies, to the time period studied, or to the fact that some studies examined only short-run effects.

This study investigates whether the level of exchange rate or its volatility or both are key factors in determining the direction and level of international trade and economic growth in Nigeria. It provides answers to the following research questions*: To what extent does exchange rate volatility influence international trade and economic growth in Nigeria? Is there any* *causality between exchange rate volatility, exports, imports and economic growth in Nigeria?* To guide the investigation of the study, the working hypotheses are as flows: *There is no significant relationship between exchange rate volatility, economic growth exports and imports in Nigeria. Exchange rate volatility and economic growth do not significantly Granger-Cause exports and imports in Nigeria.* The rest of the paper is organized in four sections. Section two is devoted to the review of related literature, while model specification is undertaken in section three. Section four presents the results and discussions, while conclusions and recommendations are presented in the last section.

2.0 Review of Related Empirical Literature

A review of literature on the impact of exchange rate volatility and economic growth on international trade provides mixed results. The impact differs from developed to developing and emerging market economies and across sectors and commodities such that no consensus exists (Cote, 1994; McKenzie, 1999; and Clark *et al.,* 2004).

Umoru and Oseme (2013) researched on the J-curve effect based on Nigerian data by adopting the vector error correction methodology. The results of the study showed a cyclical feedback between the trade balance and the real exchange rate depreciation of the Naira. However, the study further revealed that there is no empirical evidence in favour of the short-run deterioration of the trade balance as implied by the J-curve hypothesis, but there was cyclical trade effect of exchange rate shocks. This implied that, real exchange rate shock would initially improve, then worsen and then improve the country's aggregate trade balance which when correlated with real depreciation provided no support for the J-curve hypothesis in the Nigerian trade balance. Hence, the short run predictions of the J-curve were not observable in Nigeria.

The causal relationship between exchange rate volatility, trade flows and economic growth of the sub-Saharan African countries with exclusive reference to Nigeria which is considered as small open economy was investigated by Abba and Zhang (2012). The empirical study which was based on a time series data over the period 1970-2009 adopted the statistical framework of a vector autoregressive (VAR), methodology to determine the causal flows from exchange rate volatility on trade flows and economic growth. The results revealed significant effects of exchange rate volatility on trade flows and economic growth of Nigeria.

In a research carried out by Ibikunle and Akhanolu(2011) the impact of exchange rate volatility on trade flow in Nigeria investigated. Using annual data for the period 1970-2009, the study estimated the exchange rate volatility with the use of Generalized Autoregressive conditional Heteroskedasticity (GARCH). The result showed an inverse and statistical insignificant relationship between aggregate trade and exchange rate volatility in Nigeria.

Abolagba *et al.* (2010) researched on the effects of exchange rate, export volume and domestic saffron production on price of saffron, Iran's major non-oil export good in the short and long-run. The result of Autoregressive Distributed lag (ARDL) model revealed that appreciating exchange rate had statistical significant negative impact on export price of saffron while there was no significant relationship between export price and domestic production of saffron in the long-run.

Yoon, (2009) showed that the real exchange rate demonstrated different patterns of behavior depending on the exchange rate regime in place. His findings showed evidence that real exchange rate series behave as stationary processes during the fixed exchange rate regime. But he acknowledged the fact that, more stationary episodes are found in the gold standard and the Bretton-Woods periods.

Bahmani – Oskooee and Kovyryalova (2008) investigated the impact of exchange rate volatility on international trade. Rather than using aggregate imports and exports data between one country and the rest of the world or between one country and her major trading partners they concentrated on 177 commodities traded between the United States (US) and the United Kingdom (UK) and employed co-integration and error-correction techniques to analyze the data covering 1971 – 2003 period. The results revealed that the volatility of the real bilateral dollar – pound rate has a short – run significant effect on imports of 109 and exports of 99 industries. In most cases, such effects are adverse. They also found that the number of significant cases is somewhat reduced in the long run with imports of 62 and exports of 86 industries which are significantly affected by the exchange rate volatility. They concluded that in most cases the effect is negative supporting the proponents of floating rates.

Hsing (2008) examined US trade with seven South African trading partners over the last 20 or 30 years according to the studied countries and showed that a J-curve existed for Chili, Ecuador and Uruguay while a lack of support was found for Argentina, Brazil, Colombia and Peru. These findings therefore suggested that the conventional wisdom of pursuing real exchange rate depreciation in order to improve the trade balance may not apply in some countries.

Isitue and Igue (2006), investigated the effects of exchange rate volatility on US – Nigeria trade flows using GARCH modeling, co-integration, error-correction apparatus and variance decomposition on data for the period 1985 to 2005. These authors found that exchange rate volatility had a negative and significant effect on Nigeria's goods exported to the US. In line with the theoretical expectation, US GDP exerted a positive effect on Nigeria's exports but curiously, the effect was not significant in the export function.

Todani and Munyama(2005), however, used ARDL bounds testing procedure on quarterly data for the period 1984-2004 to examine the impact of exchange rate variability on aggregate South African exports to the rest of the world as well as on goods services and gold exports. They used the moving average standard deviation and GARCH *1.1) as a measure of volatility. Their results showed that depending on the measure of variability employed, either there existed no statistically significant relationship between South African exports and exchange rate volatility or when such significant relationship existed, it was positive.

Devereux and Engel (2003) emphasized that a flexible exchange rate gives room for the adjustment of relative price, when prices are sluggish, while Engel and Rogers (2001) on their part, analyze the border effects on relative prices for a sample of 55 European countries from 1981 to 1997 and concluded that exchange rate volatility accounts for parts of deviations in those prices.

Chen (2003) in his study, explain that an increase in price rigidity in the event of the uncertainty is caused by exchange rate volatility (i.e. firms becomes unwilling to change their prices due to the possibility of later reversion to exchange rate). Apart from this, volatility would account for much of inability of purchasing power parity (PPP) in cross-country analyses and decrease the speed of mean adjustment towards PPP. By testing for speed of convergence, the author discovered a positive significant coefficient for exchange rate volatility, the stickier the prices are.

Bah and Amusa (2003), examined the effect of real exchange rate volatility on South African exports to the US for the period 1990-2000 using ARCH and GARCH models. They found that the Rand's real exchange rate volatility exerted a significant and negative impact on exports both in the long and short-run.

Tenreyo (2003), utilized a gravity equation similar to that of Rose (2000) for a broad sample of countries using annual data from 1970 to 1979. The measure of volatility is the same as that employed by Rose, except that the standard deviation of the log change in monthly exchange rates was measured only over the current year. Her main objective was to address several estimation problems in previous studies of the effect of volatility on trade. When these problems were not addressed and ordinary least squares were used, she founds a small effect: reducing volatility from its sample mean of about 5 percent to zero resulted in an increase in trade of only 2 percent. When the more appropriate method was used, but without taking account of endogeneity, eliminating exchange rate uncertainty led to an estimated 4 percent increase in trade. However, when endogeneity was taken into account through the use of instruments, volatility had an insignificant effect on trade, a result that was robust on the choice of instruments.

The extent to which exchange rate volatility and economic growth affect international trade depends critically on underlying model assumptions. Key among the assumptions include the type of market structure in which firms operate, their attitude towards risk, currencies in which prices of exports and imports are denominated and the existence of hedging facilities to cover exchange rate risk.

3.0 Methodology

Annual time series data (1971-2012) for exports, imports, exchange rates, terms of trade and real gross domestic product of Nigeria in the models were sourced from the various issues of the Statistical Bulletin of Central Bank of Nigeria (CBN). Foreign income measured by real gross domestic product (GDP) of the US was sourced from the International Financial Statistics (IFS) of the International Monetary Fund (IMF). The GDP in the United States was worth 15684.80 billion US dollars in 2012. The GDP value of the United States represented 25.30 percent of the world economy (World Bank, 2013). The US has been a major destination for Nigerian exports for the entire sample period. In 2011, the US imported about US$58.5 billion (#9243 billion) from Nigeria, representing 30% of the total exports of Nigeria (NBS, 2012). Thus, the right choice of US GDP as a proxy for foreign income in the export demand equation was made.

Model Specification

This study adopted empirical model similar to that of Abba and Zhang (2012) and Umoru and Oseme (2013) in its estimations with some modifications. In this study export and import are functions of real gross domestic product, terms of trade and real exchange rate volatility.

Dummy variables are incorporated into the models to capture the effects of exchange rate policy changes within the sample period, The model specifications are therefore as follows:

$$\text{In } EX_t = \beta_o + \beta_1 \text{ In } RGDPft + \beta_2 \text{ In } TOTt + \beta_3 \text{ In } RER_t + \beta_4 RERV_t + \beta_5 DUM_t + \mu_t \qquad (3.1)$$

$$\text{In } IM_t = \beta_0^i + \beta_1^i \text{ In} RGDP_{dt} + \beta_2^i \text{ In } TOTt + \beta_3^i \text{ In } RER_t + \beta_4^i RERV_t + \beta_5^i DUM_t + \mu_t \qquad (3.2)$$

Where, EX_t is total exports during the period t, $IM_{t,}$ is total imports during the period t, $RGDP_{ft}$ is real gross domestic product of foreign country, $RGDP_{dt}$ is real gross domestic product in Nigeria, TOT_t is a measure of relative price level – import/export prices: proxied by terms of trade, $RERV_t$ is a measure of exchange rate risk faced by exporters/importers due to fluctuations in the exchange rate, RER_t is real exchange rate within the sample period, DUM_t is the dummy variables representing fixed and floating exchange rate regimes within the sample period,μ_t and μ'_t are error terms. All variables are taken in logarithm form hence all estimated parameters are elasticities. $RGDP_{dt}$ and $RGDP_{ft}$,are variables that capture demand conditions in the domestic and foreign economy. Thus, the *a priori* expectation on $RGDP_t$ and $RGDP_{ft}$ are positive i.e. elasticities β_1 and β_1^1 can exceed unity as income picks up the effects of other factors related to it that cannot be easily disentangled but influenced imports/exports increases as well. The foreign income data is in billions of current US dollars which are multiplied by the real exchange rate to calculate the real export and import in Nigerian currency.

TOT_t is the terms of trade. In the absence of actual relative export/import price data terms of trade is used as a proxy (Bahmani – Oskooee and Hegerty 2009). An increase in the foreign price relative to the domestic price of the competing good tends to increase exports but depress imports. In this study, relative import and export prices are approximated by the terms of trade (TOT) due to lack of data on imports/exports prices in Nigeria. Favourable terms of trade are anticipated to increase the volume of international trade. Therefore, it may be postulated that the terms of trade variable will exert a positive impact on trade flows. Thus, our *a priori* expectation on TOT_t is positive (i.e. elasticities $\beta_2>0$ and $\beta_2'>0$).

The real exchange rate is defined as nominal domestic currency price of one unit of the foreign currency adjusted for the inflation differential between the two countries. Thus, an increase in the real exchange rate represents depreciation while a decrease refers to real appreciation. Real depreciation lowers (increase) the foreign currency price of exports (imports) and consequently tends to increase (lower) the volume of exports (imports) and exports revenue in domestic currency terms. Conversely, real appreciation lowers exports competitiveness, reduces the volume and return on exports in value terms expressed in domestic currency. The opposite is true for imports: volume of imports increase as their domestic currency value reduces. Hence, the sign of the coefficient on RER_t in the export and import demand equations are positive (elasticity $\beta_3 > 0$) and negative (inelasticity $\beta'_3 < 0$), respectively.

In line with theoretical arguments, the expected sign on ERV_t is ambiguous (i.e. β_4 and $\beta'_4 > 0$ or < 0 – semi-elasticity). Further, there is a huge debate in the literature on whether real or nominal exchange rates (Akhtar and Spence- Hilton, 1984; and Mckenzie and Brooks, 1997) should be employed. While the two are conceptually different, in practice, the difference is negligible (Clark *et al.,* 2004). Both real and nominal exchange rates are practically the same, given the unpredictability of domestic goods prices in the short-run. The difference between the two is noticeable during periods of high inflation when nominal exchange rate volatility tends to exceed real exchange rate volatility. If real and nominal exchange rates are highly correlated, their effect on trade will be similar. Empirically, the difference in coefficient estimates between the two is negligible (Rahmatsyah *et al.,* 2002). Nonetheless, to take into consideration inflationary effects, real exchange rate volatility was examined in this study.

Another determining element in the study of exchange rate volatility is the choice of appropriate measure of volatility. A number of measures of exchange rate volatility have been used as a proxy for risk or uncertainty in past studies (McKenzie, 1999; IMF 2004; and Bahmani-Oskooee and Hegetry, 2009) and there is no consensus about the appropriateness of one measure relative to another. The most common measure of volatility is some measure of variance. The volatility variable may be constructed as the standard deviation of the exchange rate variable or as a moving standard deviation (Cho *et al.,* 2002; Bahmani – Oskooee and Mitra, 2008; Bahmani – Oskooee and Kovyryalova 2008). Other contributors estimated exchange rate volatility with a generalized Autoregressive conditional Heteroskedasticity (GARCH) model (e.g. Del Bo, 2009). The standard deviation is the most important and most common measure of dispersion or variability because it captures the deviation of each of the observations from the mean. This is actually the risks component or uncertainty which this study is set to verify. This study therefore employed the standard deviation of the first difference of the logarithm of the monthly exchange rate variable as a measure of volatility.

Government programmes and policies are expected to positively influence the Exchange Rate Policies and were therefore designed to improve trade flows by improving naira/dollar exchange rate. Hence, the sign of the coefficient on DUM_t in the export and import demand equations are positive (elasticity $\beta_5 > 1$) and negative (elasticity $\beta`_5<0$), respectively.

Analytical Framework

Johansen Method

The Johansen maximum likelihood system-based reduced-rank regression approach determines the presence of co-integration in non-stationary time series using the trace (λ_{trace}) and maximum eigenvalue (λ_{max}) statistical ratio tests. The non-stationary time series are set up as VAR in general form.

$$\Delta z_t = \phi D_t + \Pi z_{t-1} + \sum_{i=1}^{p-1} \mathrm{r}, \Delta z_{t-i} + \varepsilon_t \qquad \text{\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_} (3.3)$$

Where: Δ *is the difference* operator, z_t, is an (nxl) vector of non-stationary variables (n) in levels such that variables in equations 3.1 and 3.2 constitute elements of z_t, i.e. z_t = (EX_t, IM_t, $RGDP_t$, TOT_t, ERV_t, RER_t, DUM_t); D_t is an (nxl) vector of deterministic variables intercept, time trend, seasonal dummy variables or other intervention dummies, ϕ is a matrix of coefficients of deterministic variables; $\Pi = (\Pi_1 - \Pi_2 - ....\Pi_p - 1)$ is an (nxn) impact matrix of unknown coefficient with *I* being an (nxn) identity matrix; n is the number of variables constituting z_t; r_1 =

(1-r_1 – r_2 - …. – r_p), the short-run response matrix I = 1,2,3…., p, is a matrix of parameter coefficients on lagged first difference of $z_t$variables; ε_t is an (nx1) vector of Gaussian innovations; *p* is the lag length for the VAR; and *1* = 1,2,…..,*T*.

The Π matrix is a product of two matrices α and β that contains information about the long-run relationship among z_t, variables. A is an (nxr) matrix of coefficients reflecting how quickly each variable in z_t, adjusts towards the equilibrium once a disequilibrium occurs while β is an (rxn) matrix representing co-integrating vector(s) with long-run coefficients among z_t. The rows of β also known as the co-integrating rank *(r)* of Π form the r distinct co-integrating vectors such that the elements in $\beta' z_t$ are stationary even though z_t is itself non-stationary.

To detect the presence of co-integration in the unrestricted VAR, the rank of Π must be determined through its eigenvalues (λ_1) using λ_{trace} and λ_{max}. The rank of Π is equal to the number of non-zero λ_is arranged in ascending order: $\lambda_1 \geq \lambda_2 \geq \lambda_3 \geq ….. \geq \lambda_n$. The number of significant eigenvalues in the estimated matrix defines the rank of Π.The condition for co-integration is for the Π matrix to have a reduced rank i.e. 0 < r $\leq$ (n-1). Otherwise a co-integrating relationship will not exist among z_t variables if the rank of Π is either equal to n or zero.

The number of r is confirmed by comparing the test statistics with the critical values such that the null of the number of r present is rejected in favour of the alternative if the statistic exceeds the critical value for a given λ_1. A non-zero vector indicated by the two tests implies a stationary long-run relationship between z_t variables and the larger the number of non-zero vectors the more stable is the system. It is possible for the two tests to lead to different conclusions about the number of co-integrating vectors. The choice between λ_{trace} and λ_{max} depends on the economic interpretation of the co-integrating vectors. Generally, λ_{max} is preferred to λ_{trace} due to the precise formulation of the alternative hypothesis in determining the rank of Π (Enders, 2004).

Once co-integration is confirmed, a VECM that incorporates both short-run and long-run effects is estimated such that $\beta' z_{1-1}$ is the error-correction as $\beta' z_{t-1} \sim 1(0)$ through co-integration and defines the stability condition for the ECM. This is in line with the postulation by the Granger representation theorem that dynamic error-correction representation of a given data set exists if a co-integrating relationship exists among them (Engel and Granger, 1987). If co-integration is not detected, a VAR in first differences of z_t is estimated as there is no stationary linear combination of the z_t variables and thus no error-correction representation.

Residuals are assumed to be Gaussian. Thus an optimal lag length for the unrestricted VAR and subsequently VECM that ensure serially uncorrelated residuals is chosen based on an appropriate Lagrange-Multiplier (LM) test and information criteria (AIC, SBC). The adequacy of the estimated VECM can be checked based on equation residuals using various diagnostic tests such as serial correlation, normality and heteroskedasticity. Further, the deterministic term can enter either the VAR or the co-integrating equation or both. The decision on this kind of specification is empirical. The Pantula principle is usually employed to select the appropriate deterministic trend specification in a co-integrating VAR (Asteriou and Hall, 2007).

The Pantula principle refers to the process of choosing the appropriate model with respect to deterministic terms entering the co-integration specification. The test starts with the most restrictive least to the least restrictive one using the trace test statistic for the null of no co-integrating. The process stops (hence optimal model determined) when the null is rejected for the first time.

The Johansen tests allows for hypothesis testing on the elements of the Π matrix informed by theoretical predictions or model restrictions. Thus, linear restrictions are imposed on α and β to obtain an economically interpretable relationship among z_t variables once co-integration is confirmed. This involves determining whether the co-integrating vectors are identified and check for parameter constancy in the long-run co-integrating vector. Thus tests such as weak exogeneity and causality using χ^2 statistics as well as innovation accounting (impulse response and variance decomposition) can be performed.

With co-integration confirmed, causality must exist in at least one direction (Choudhry, 2005). If β for a variable in any co-integrating vector is insignificant, then this confirms absence of causality among variables under study. If however, α for any of z_1 is equal to zero, the corresponding variables is characterized as weakly exogenous with respect to β. The significance of α_i, implies rejection of weak exogeneity corresponding to variable *i* in a given co-integrating vector, implying long-run causality running from variable *i* in a given co-integrating vector(s). Conversely, the insignificance of α_i means variable *i* is weakly exogenous, and thus no causality exists. Bi–directional long-run causality exists when weak exogeneity is rejected for two variables.

Granger Causality Test

Granger causality test is used when we know that some relationship exists between two variables but we do not know which variable causes the other to move. We will apply Granger causality test to identify causal relationship between the variables under study. According to Granger (1969), a variable Y is caused by another variable X if Y can be predicted well from past values of Y and X than from past values of Y alone. The Granger test may be explained with the help of the following equations.

$$X_t = a_o + \sum_{j=1}^{m} aj x_{t-j} + \sum_{j=1}^{n} bj Y_{t-j} + e_t \qquad (3.4)$$

$$X_t = C_o + \sum_{j=1}^{m} cj x_{t-j} + \sum_{j=1}^{n} dj x_{t-j} + w_t \qquad (3.5)$$

Where: X and Y are two stationary time series, a_0; c_o; a; c; b; and d; are coefficients, e_t and w_t are uncorrelated white noise series. The definition of causality given above implies that if Y_t is to cause X_t, then some bj are non–zero in 3.4 above. If both the events occur simultaneously, there is said to be a feedback between X_t and Y_t. In other words, the null hypothesis Y_t does not strictly Granger-cause X_t and is rejected if the coefficients on the lag values of Y_t in equation (3.4) are jointly significantly different from zero. Bi-directional causality exists if the null hypothesis, that X_t does not strictly Granger-cause Y_t, is also rejected. Suppose E and T are Two variables representing exchange rate volatility and trade flows (imports /exports) respectively. To see whether E Granger cause T or T granger cause E, the following equations are run.

$E_t=\beta_o + \beta_i E_{t-1} + ... + \beta_p E_{t-p} + \alpha_1 T_{t-1} + ...+ \alpha_p T_{t-p} + \varepsilon_t$ _____ (3.6)

Application of Granger causality requires two tests to run at the same time to check the relationship in each direction. So the second test is

$T_t = \beta_o + \beta_i T_{t-1} + ... + \beta_p T_{t-p} + \alpha_1 E_{t-1} + ... + \alpha_p E_{t-p} - \varepsilon_t$ _______ (3.7)

Test (3.6) is test of causation running from exchange rate volatility to trade flows and equation (3.7) is causation test running from trade flows to exchange rate volatility.

Null hypothesis of Granger causality test is that coefficient of $T(\alpha_s)$ in equation (3.6) and coefficients $E(\alpha_s)$ in equation (3.7) are jointly zero. Rejection of null hypothesis in equation (3.7) means that causation runs from exchange rate volatility to trade flows. The number needs to be selected on the basis of their significance for accuracy of result. Lags are dropped until the last lag is significant. The result of granger causality tests are carefully interpreted, as it just shows the statistical relationship between variables. It does not mean that one series if comes first causes the other to move.

The steps involved in implementing the Granger causality test are as follows: we illustrate these steps with trade flows (TF) and exchange rate volatility (ERV).

1) Regress current TF on all lagged TF terms and other variables, if any, but do not include the lagged ERV in the regression. This is the restricted regression. From this regression obtain the restricted residual sum of squares, RSSR.
2) Now run the regression including the lagged ERV terms. This is the unrestricted regression. From this regression obtain the unrestricted residual sum of squares, RSS_{UR}.
3) The null hypothesis is H_o: α; = o, I = 1, 2 … n, that is, lagged ERV terms do not belong in the regression.
4) To test this hypothesis, we apply the F-test given by:

$$F = \frac{(RSS_R - RSS_{UR})ERV}{RSS_{UR} / (n-k)}$$

Which follows the F distributions with ERV and (n-k) df. In the present case ERV is equal to the number of lagged ERV terms and k is the number of parameters estimated in the unrestricted regression.

5) If the computed F value exceeds the critical F-value (tabulated) at the chosen level of significance, we reject the null hypothesis, in which case that lagged ERV terms belong in the regression. This is another way of saying that ERV causes TF.
6) Step 1 to 5 can be repeated to test whether TF causes ERV. The number of lagged terms to be introduced in the causality tests is an important critical question because the direction of causality may depend critically on the number of lagged terms included.

4.0 RESULTS AND DISCUSSION

Unit Root Tests: Stationarity properties of the variables were tested by employing the unit root tests. This was carried out using the augmented Dickey-Fuller (ADF) unit root test. The result is presented in Table 4.1 below.

Table 4.1 Unit Root Tests for Export and Import Variables

	Augmented Dickey Fuller			
	With constant		With constant and trend	
Variables	I(0) Level prob.	I(1) FD prob.	I(0) Level prob.	I(1) FD prob.
Export	0.8927	0.0000	0.4438	0.0001
Import	0.9243	0.0000	0.5436	0.0000
$RGDP_{ft}$	0.9100	0.0001	0.8546	0.0007
$RGDP_{dt}$	0.9400	0.0002	0.8243	0.0008
TOT	0.0941	0.0000	0.0124	0.0000
RER	0.9504	0.0006	0.6052	0.0005
RERV	0.0080	0.0004	0.0011	0.0003

FD – first difference
Source: *Researcher's compilation 2015*
The unit root result in Table 4.1 shows that all the variables except exchange rate volatility were not stationary at levels but became stationary at first difference. This is evidenced from their respective probability values.

Co-integration Analyses: Having confirmed the stationarity properties of the variables, we proceeded to determine the existence of a long-run relationship among these variables. The Johansen maximum likelihood procedure was applied to a Vector Autoregressive (VAR) version of equations (3.1) and (3.2), respectively. The results are presented in tables 4.2 and 4.3 below.

Table 4.2 Export Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.668669	130.0286	95.75366	0.0000
At most 1 *	0.567582	86.94772	69.81889	0.0012
At most 2 *	0.487934	54.25157	47.85613	0.0111
At most 3	0.300003	28.14884	29.79707	0.0765
At most 4	0.177536	14.23834	15.49471	0.0766
At most 5 *	0.156027	6.615752	3.841466	0.0101

Trace test indicates 3 cointegratingeqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.668669	43.08085	40.07757	0.0223
At most 1	0.567582	32.69615	33.87687	0.0686
At most 2	0.487934	26.10273	27.58434	0.0764
At most 3	0.300003	13.91050	21.13162	0.3724
At most 4	0.177536	7.622587	14.26460	0.4184
At most 5 *	0.156027	6.615752	3.841466	0.0101

Source: Researcher's compilation from E-views 8.0 WIN processed
Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 4.3 Import Co-integration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.668669	130.0273	95.75366	0.0000
At most 1 *	0.567581	86.94645	69.81889	0.0012
At most 2 *	0.487930	54.25039	47.85613	0.0111
At most 3	0.299984	28.14794	29.79707	0.0765
At most 4	0.177542	14.23851	15.49471	0.0766
At most 5 *	0.156025	6.615658	3.841466	0.0101

Trace test indicates 3 cointegratingeqn(s) at the 0.05 level

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.668669	43.08087	40.07757	0.0223
At most 1	0.567581	32.69606	33.87687	0.0687
At most 2	0.487930	26.10246	27.58434	0.0764
At most 3	0.299984	13.90942	21.13162	0.3725
At most 4	0.177542	7.622857	14.26460	0.4183
At most 5 *	0.156025	6.615658	3.841466	0.0101

Source: Researcher's compilation from E-views 8.0 WIN processed

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The co-integration test results showed that there was co-integration in both the export model variables and import model variables respectively, with the trace test giving 3 co-integrating equations and max-eigenvalue test giving 1 co-integrating equation. Once there is co-integrating vector, a long run relationship is concluded (Gujarati, 2003). The models were normalized on the export (EXP) and import (IMP) variables in order to obtain the long-run parameter estimates.

Error Correction Model (ECM)

Given the presence of co-integration which led to the conclusions on the inherent long-run relationship of variables in the models, we proceeded to investigate the short-run dynamics of the export demand and import demand functions. The Error Correction Model (ECM) provides a framework for establishing links between the short-run and long-run approaches to econometric modeling. The estimated results of the error correction models for exports and imports are presented in Tables 4.4 and 4.5, respectively, below.

Table 4.4: Parsimonious Short-Run Dynamics Error Correction Model (Export)

Variables	Coefficient	Std. Error	t- statistic	p- value
D (LN EXP (-1))	0.0769	0.16583	0.4637	0.5261
D(LNRGDP$_{ft}$ (-1))	2.1350	0.91896	2.3233	0.0203 *
D (LN TOT (-1))	-0.2690	0.30742	-0.8750	0.4312
D(LN RER(-1))	-1.4135	1.05601	-1.3385	0.0648
D(RERV(-1))	0.2203	0.06038	3.6486	0.0153 *
D(DUM(-1))	-1.0782	0.37450	-2.8790	0.0006 **
ECM(-1)	-0.2801	0.23897	-1.1721	0.0420 *
Constant	-0.0384	0.10478	-0.3665	0.7435

Source: Researcher's compilation 2015
** indicates 1% level of significance, * indicates 5% level of significance

The estimate of export price relative to export demand of trading partners has the expected negative sign in the short-run. A 10 percent increase in the relative price resulted in 26.90 percent reduction in exports of goods and services in Nigeria. The coefficient of the real exchange rate is -1.4135 in the short-run export model and it was not significant. This implied that a 10 percent exchange rate (devaluation/depreciation) had no significant effect on export in the short-run. This was not in line with *a prior* expectation and the long-run result. A plausible explanation to this was that Nigeria's major export item is oil. A devaluation of the Naira in the short-run had no significant effect on its major export whose demand was inelastic. The exchange rate volatility was significant with elasticity of -0.2203. A 10 percent increase in exchange rate volatility would result in 22.03 percent reduction in exports. The coefficient in the error correction term was negative and statistically significant.. Theoretically, the estimated coefficient of the error correction term should be negative and lie within an interval of zero and one. Thus, the larger the magnitude of this coefficient is, the faster the speed of adjustment toward the long-run equilibrium. In the export demand model, any deviation from the static equilibrium was corrected at a rate of about 28 percent within the year. Table 4.5 presents the short-run results of the import demand model below.

Table 4.5: Parsimonious Short-Run Dynamics Error Correction Model (Import)

Variables	Coefficient	Std. Error	t-Statistic	Prob.
D (LN IMP (-1))	0.0917	0.16974	0.5402	0.4670
D(LNRGDP$_{dt}$ (-1))	0.3182	0.23136	1.3754	0.0406*
D (LN TOT (-1))	0.4335	0.12713	3.4099	0.0175*
D(LN RER(-1))	-0.3315	0.85433	-0.3880	0.7104
D(RERV(-1))	0.2232	0.25456	0.8768	0.0459*
D(DUM(-1))	-1.0141	0.23806	-4.2599	0.0002**
ECM(-1)	-0.2511	0.12070	-2.0804	0.0481*
Constant	0.0673	0.08651	0.7779	0.2729

Source: Researcher's compilation 2015
**indicates 1% level of significance,*indicates 5% level of significance.

The results showed that domestic income had a positive and significant impact on imports in Nigeria. The elasticity of 0.3182 was an indication that an increase in domestic income by 10 percent would lead to an increase in imports by 31.82 percent in Nigeria. Terms of trade exhibited a positive and significant impact on import in the short-run. The elasticity of -0.4335 implied that 10 percent improvement in terms of trade (favorable terms of trade) would lead to an increase in import by 43.35 percent. The real exchange rate was not supported by the import model in the short-run.

This could be attributed to the fact that in Nigeria most imported goods do not have competitive domestic substitutes; therefore changes in exchange rate did not significantly influence them in the short-run. This created a critical necessity for alternative demand management policies of which fiscal and monetary policies had a pivotal role to play. The error correction term conformed to expectations as regarded sign and significance. The magnitude of -0.2511, in the import model, implied that following a divergence from equilibrium, about 25 percent of adjustment took place in the current period. In sum, merchandise import volume in Nigeria was related to domestic income, terms of trade, real exchange rates, exchange rates volatility as well as corrections to disequilibrium.

Granger Causality Test

In this study, trade flows (export and import) and exchange rate volatility are two series, which were assumed to be correlated. Null hypothesis of Granger Causality Test is that one series does not granger cause the other series. Table 4.6 reported the results of Granger causality tests. As series under consideration were non-stationary at levels and were not co-integrated, Granger causality had therefore been employed on first difference on exports, and imports (the dependent variables) and exchange rate volatility, real exchange rate, foreign income, domestic income, terms of trade and dummy, as explanatory variables. Initially, lags were set equal to 12 and then dropped until the last lag of 2 was significant.

Table 4.6: Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
$LNRGDP_{ft}$ does not Granger Cause LNEXP	39	8.66315	0.0009
LNEXP does not Granger Cause $LNRGDP_{ft}$		2.42353	0.1038
LNTOT does not Granger Cause LNEXP	39	0.22118	0.8027
LNEXP does not Granger Cause LNTOT		0.90357	0.4146
LNRER does not Granger Cause LNEXP	39	6.08410	0.0055
LNEXP does not Granger Cause LNRER		2.64276	0.0357
RERV does not Granger Cause LNEXP	39	0.58458	0.5628
LNEXP does not Granger Cause RERV		6.07128	0.0056
DUM does not Granger Cause LNEXP	39	2.02768	0.1473
LNEXP does not Granger Cause DUM		1.97420	0.1545
$LNRGDP_{dt}$ does not Granger Cause LNIMP	39	6.03420	0.0057
LNIMP does not Granger Cause $LNRGDP_{dt}$		0.27126	0.7641
LNTOT does not Granger Cause LNIMP	39	5.41592	0.0091
LNIMP does not Granger Cause LNTOT		0.90346	0.4147
LNRER does not Granger Cause LNIMP	39	3.89712	0.0299
LNIMP does not Granger Cause LNRER		1.14320	0.3307
RERV does not Granger Cause LNIMP	39	4.61622	0.0168
LNIMP does not Granger Cause RERV		0.01047	0.9896
DUM does not Granger Cause LNIMP	39	4.66290	0.0162
LNIMP does not Granger Cause DUM		1.15339	0.3276

Source: *Researcher's compilation 2015*

The results showed that causality runs from foreign income and gross domestic product to export and import, respectively, while no causality runs from export and import to foreign income and gross domestic product. The unidirectional causal flow from foreign income to export indicated poor performance of non-oil exports in Nigeria. The over reliance on oil exports as the main sources of foreign exchange earnings which could cause price fluctuation and production instability due to internal crises. The unidirectional causal flow from gross domestic product to import indicates Nigeria's overdependence on imports. Although significant volume of imports was needed to boost industrial base of the country, which became imperative for increase in economic activities and hence economic growth, the nature of the importation was more of consumption purposes, which equally harm the survival of the domestic industries.

There was no causality between terms of trade and export and between export and terms of trade. This was because the null hypothesis was rejected in both cases. A unidirectional causality runs from terms of trade to import but no causality from import to terms of trade. This implied that import demand was inelastic to relative prices.

This seemed to be obvious on account of the important contribution of imports to offsetting domestic shortage of consumer durables as well as provision of inputs into production processes. The results supported the existence of bi-directional causality between real exchange rate and export. Null hypothesis of no Granger causality running from real exchange rate cannot be accepted. This was evident from their probabilities of 0.0055 and 0.0357, respectively. On the other hand, a unidirectional causality run from real exchange rate to import but no causality flow from import to real exchange rate as evidenced in their p-values of 0.0299 and 0.3307, respectively. An economic explanation to this was that real exchange rate played significant role in determining exports, imports and the overall direction of the economic activities in Nigeria. Real exchange rate encourages more imports in Nigeria. This is in conformity with many empirical findings (for example see Abbot and De Vita, (2004), and Bahmani-Oskooee and Kouyryalova, 2008) and theoretical postulations that support floating system of exchange rate.

Granger causality results revealed unidirectional causality running from exchange rate volatility to exports and imports with their P-values of 0.0056 and 0.0168, respectively, but no causality flow from exports and imports to exchange rate volatility.

The exchange rate volatility had a vital causality link with exports and import in Nigeria. It confirmed the inelastic nature of major exports and imports products in Nigeria. There was no Granger causality running from dummy to exports and from exports to dummy: Null hypothesis of no Granger causality was therefore accepted. The results also revealed Granger causality running from dummy variables to imports with a p-value of 0.0162 and no causality from imports to dummy variables. This clearly explained that exchange rate systems did not significantly Granger causes export flows but significantly determine the direction of imports in Nigeria.

Variance Decomposition

The variance decomposition tests the proportion of changes in the dependent variable that had been explained by the changes in the independent variables. The results of the variance decomposition based on export and import were shown in Tables 4.7 and 4.8, respectively below:

Table 4.7 Variance Decomposition of Exports

LNEXP: Period	S.E.	LNEXP	LNRFI	LNTOT	LNRER	RERV	DUM
1	0.337097	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.506425	77.46077	5.190265	0.864796	5.917662	9.888523	0.677984
3	0.622328	70.23546	5.399822	1.121325	6.644331	10.763772	5.835293
4	0.738171	68.12721	6.197990	1.436816	6.590404	10.842139	6.805441
5	0.834862	66.89456	7.819278	1.286292	6.068296	11.737952	6.193625
6	0.910041	66.55344	7.157341	1.167516	5.833947	12.394229	6.893524
7	0.982235	66.30639	7.229921	1.147738	5.609466	13.215978	6.490517
8	1.052936	66.03464	7.481502	1.138635	5.416323	12.972274	6.956635
9	1.118284	65.82033	7.721755	1.107057	5.274086	12.775751	7.301028
10	1.179003	65.68292	7.856297	1.080050	5.164944	12.639506	7.576283

Source: *E-views 8.0 WIN Processed*

The results indicated that exchange rate volatility did not explain significant percentages of the changes in the level of exports during the first period. Exchange rate volatility explained by the second period about 9.9% of the changes in level of exports and this was increased to 11.7 percent in the fourth period and about 12.6 percent in the tenth period, reflecting the problem caused by exchange rate volatility to exports in Nigeria. Hence, shocks from the volatility of exchange rates were not only significant but were also worrisome in the light of the relatively large effect it could exert on export flows.

Table 4.8 Variance Decomposition of Imports

LNIMP: Period	S.E.	LNIMP	LNRGDP	LNTOT	LNRER	RERV	DUM
1	0.304638	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.429939	77.51615	4.949351	0.524495	4.590324	8.317242	4.102438
3	0.529819	70.00978	6.457967	1.895542	5.567727	10.272150	5.796835
4	0.627542	64.40690	7.555847	1.298287	6.830298	12.360221	7.548441
5	0.714871	61.90023	8.136463	1.333430	6.410782	14.123305	8.095794
6	0.789750	60.89250	9.230701	1.327351	7.155942	13.196815	8.196703
7	0.858676	59.99315	10.302022	2.380248	8.984299	11.212664	7.127628
8	0.924104	59.17972	10.425617	2.428660	8.862084	11.307976	7.795947
9	0.985455	58.61189	11.517187	3.449471	9.768990	11.386977	7.265497
10	1.042976	58.20262	11.570013	3.464396	9.696883	11.425980	7.640114

LNDI: Period	S.E.	LNIMP	LNDI	LNTOT	LNRER	ERV	DUM
1	0.286263	0.051262	99.94874	0.000000	0.000000	0.000000	0.000000
2	0.442096	0.472147	94.06954	3.717584	1.212920	0.526930	0.000879
3	0.560846	0.652133	89.31414	4.628479	2.428699	2.598976	0.377570
4	0.668781	0.762480	84.26983	5.030102	4.785478	4.307680	0.844428
5	0.757038	0.928731	80.48093	5.658577	7.362736	4.257920	1.311104
6	0.834260	1.168508	78.02684	5.954077	9.205364	4.031262	1.613952

Source:*E-views 8.0 WIN Processed*

Similar to the variance decomposition of exports, the imports accounted for all the variations on imports in the first period. Indeed import itself was the most dominant of variations in imports but this dominance waned as the period proceeded. For example, by the end of the tenth period it only accounted for about 58.2 percent of the variations. With regards to the explanatory variables, the volatility of exchange rate was the most dominant determinant of variations in import, rising gradually from the second period with about 8.3 percent exchange rate volatility to about 11.4 percent in the tenth year. This indicated the over – reliance of the country on imported finished goods and inputs. This had serious adverse economic implication on the survival of domestic industries especially small and medium scale industries in Nigeria.

Conclusion and Recommendations

This study analyzed the impact of real exchange rate volatility and economic growth on exports and imports in Nigeria using a vector error correction model and employed time series data from 1971 to 2012. The study found that in both the short-run and long-run, Nigeria's trade flows were chiefly influenced by exchange rate volatility, real exchange rates, real foreign income, real gross domestic product, terms of trade and exchange rate policy switch. The findings further revealed that exchange rate volatility depressed trade flows in the long-run. Conclusively, the empirical results from the study indicated significant effects of exchange rate volatility and economic growth on international trade in Nigeria. The study recommends that policy-makers should seek for a well-managed exchange rate regime that would ensure a non-volatile behaviour as this could depress exports. Any exchange rate policy in the country that aimed to encourage exports to its trading partners regardless of its volatility was likely to be counter-productive .The statistical significance of both real foreign income and real gross domestic product were indications that tariff measures would be ineffective and as a result the study believed that effective import substitution industrialization would significantly reduce pressure on the external sector and will actually increase economic activities and hence economic growth. Finally, diversification of the economy by shifting emphasis from oil to non-oil agricultural and manufacturing sectors especially the small and medium scale enterprises and entrepreneurial development will boost exports and enhance economic growth in Nigeria.

REFERENCES

Abba, A.S and Zhang, Y. (2012), "Exchange Rate Volatility, Trade Flows and Economic Growth in a Small Open Economy", *International Review of Business Research Papers* Vol. 8. No. 2, 118-131.

Abbot, A.and De Vita, G. (2004), 'Real Exchange Rate Volatility and US Exports': An ARDL Bounds Testing Approach, *Economic Issues*, vol. 9 (1), 121-142.

Abolagba, E.O Onyekwere, N.C., Agbonkpolor, B.N and Umar, H.Y. (2010), "Determinants of Agricultural Exports", *Kamala-Raji J. Hum Ecol,* 29(3):181-184.

Akhtar, M.A and Spence-Hilton, R. (1984), "Effects of Exchange Rate uncertainty on German and U.S Trade", *Quarterly Review* (Federal Reserve Bank of New York, Spring): 7-16.

Arize, A., Osang, T. and Slottje, J.D (2008), "Exchange rate Volatility in Latin America and its Impact on Foreign Trade", *International Review of Economic and Finance,* 17:33-44.

Arize, A., Osang, T. and Slottje, J.D. (2000), "Exchange Rate Volatility and Foreign Trade: Evidence from Thirteen LDCs", *Journal of Business and Economic Statistics,* 18(1):10-17.

Asteriou, D. and Hall, S.G. (2007), "*Applied econometrics": A modern Approach,* New York Palgrave Macmillan.

Bah, I. and Amusa, H.A (2003), "Real Exchange Rate Volatility and Foreign Trade: Evidence from South Africa's Exports to the United States", *The African Finance Journal,* 5 Part 2.

Bahmani-Oskooee, M and Hegerty, S.W.(2009), "The Effects of Exchange Rate Volatility on Community Trade between the United states and Mekico", *Southern Economic Journal,* 75(4): 1019-1044.

Bahmani-Oskooee, M. and Kovyryalova, M. (2008), "Impact of Exchange rate Uncertainty on Trade flows: Evidence from Community Trade between the United States and the UK", *The World Economy,* 31(8), 1097-1128.

Bahmani-Oskooee, M. and Mitra R. (2008), "Exchange Rate Risk and Commodity Trade between the US and India", *Open Economics Review,* 19, 71-80.

CBN, (2010) Central Bank of Nigeria Annual Publication, Abuja.

CBN, (2011) Central Bank of Nigeria Annual Publication, Abuja.

Chen, S.S. (2003), Revisiting the Interest Rate-Exchange Rate Nexus: A Markov Switching
Approach, International Finance 0303002, econ WPA Revised.

Chit, M.M. (2008), "Exchange Rate Volatility and Exports: Evidence from the ASEAN – China Free Trade Area", *Journal of Chinese Economic and Business Studies,* 6(3): 261-277.

Cho, G. Sheldon, I.M. and McCorriston, S. (2002), "Exchange Rate Uncertainty and Agriculture Trade", *American Journal of Agriculture Economics 84(4), 931-942.*

Choudhry, T. (2005), "Exchange Rate Volatility and the United States Exports: Evidence from Canada and Japan", *Journal of Japanese International Economics*, 19:51-71.

Choudhry, T. (2008) "Exchange Rate Volatility and United Kingdom Trade: Evidence from Canada, Japan and New Zealand", *Empirical economics*, 35:607-619.

Clark, P.B (1973),"International Trade and the Forward Exchange Market", *American Economic Review,* 63:494-503.

Clark, P.N., Tamirisa, S., Sadikov, A. and Zeng L. (2004), "Exchange Rate Volatility and Trade Flows: Some New Evidence", *IMF, May.*

Cote, A. (1994), "Exchange Rate Volatility and Trade – A Survey", *Bank of Canada, Working Paper.*94-95.

Del' Bo, C. (2009), "Foreign Direct Investment, Exchange Rate Volatility and Political Risk." *ETSG Conference,* September, Rome.

Devereux, M.B. and Engel, C.(2003), ‘Monetary Policy in Open Economy Revisited: Price setting and Exchange Rate Flexibility,*’ The Review of Economic Studies, October.*

Enders, W. (2004), “*Applied Econometric Time Series”*, New York: Wiley.

Engle, R.F. and Granger, C.W (1987), “Co-Integration and Error Correction: Representation, Estimation and Testing”, *Econometrica,* 55:251-276.

Granger, C.W.J.(1969), “Investigating Causal Relations by Economic Models and Cross-Spectral Methods”, *Econometrica,* Vol (37), 424-438.

Hooper, P. and Kohlhagen, S. (1978), “The Effect of Exchange Rate Uncertainty on the Price and Volume of International Trade”, *Journal of International Economics,* 8:483-511.

Hsing, M, (1999), “The Effects of Exchange Rate trends and Volatility on export Prices”, *Weltwirtschaftliches Archiv.,*125, 522-688.

Ibikunle , J.A and Akhanolu, A. (2011), “An Empirical Investigation of the Link Between Exchange Rate Volatility and Trade in Nigeria”, *Journal of Emerging Trends in Economics and Management Sciences,* 2(3): 175-183.

IMF (1984), “Exchange rate Volatility and World Trade”, *International Monetary Fund Occasional paper* No. 28.

IMF (2004), “A New Look at Exchange Rate Volatility and Trade Flows”, *Occasional Papers,* 46, 315-34.

Isitua, K.O and Igue, M.N. (2006). “Exchange Rate Volatility and US- Nigeria Trade Flows: An Econometric Appraisal of the Evidence”, Senegal.

Jeong, J. (2000), “What Drives Exchange Rates?: The case of the yen/dollar Rate”, *Multinational Business Review,* Fall: 31-36.

Johansen, S. (1988), “Statistical Analysis of Co-integration Vectors”, *Journal of Economic Dynamic Control* 12: 231-254.

Johansen, S. and Juselius, K. (1990), “Maximum Likelihood Estimation and Inference on Co-integration with Application to the Demand for Money”, *Oxford Bulletin of Economics Statistics,* 52: 169-210.

McKenzie, M. and Brooks, R. (1997), "The Impact of Exchange Rate Volatility on Financial Markets, Institutions and Money, 7(1): 73-87.German – US Trade Flows*", Journal of International.*

McKenzie, M.D (1999), "The Impact of Exchange Rate Volatility on International Trade Flows", '*Journal of Economic Surveys,* 13(1):71-106.

Munyama, T.V and Todani, K.R. (2005), "Exchange rate Volatility and Exports in South Africa", *Annual Forum 2005 Trade and uneven Development: Opportunities and Challenges.*

NBS, (2012), National Bureau of Statistics, Abuja, Nigeria.

Obiora, K.I. and Igue, N.N. (2006), "Exchange Rate Volatility and U.S. Nigeria Trade Flows: An Econometric Appraisal of the Evidence." *Paper Presented at the 11th Annual Conference of the African Economic Society,* 5th – 7th July. Dakar, Senegal.

Odili, O. (2014), "Exchange Rate and Balance of Payment: An Autoregressive Distributed Lag (ARDL) Econometric Investigation on Nigeria*. IOSR Journal of Economics and Finance,* vol.4, Issue 6, 21-30.

Oyinlola, M.A., Adeniyi, O. and Omisakin, O. (2010), "Responsiveness of Trade Flows to changes in Exchange Rate and relative Prices: Evidence from Nigeria", *International Journal of Economic Sciences and Applied Research* 3(2):123-141.

Ozturk, I. (2006), "Exchange Rate Volatility and Trade: A Literature Survey", *International Journal of Applied Econometrics and Quantitative Studies*, 3(1): 85-102.

Rahmatsyah, T., Rajaguru, G. and Sieregar, R.Y. (2002), "Exchange Rate Volatility, Trade and 'Fixing for Life' in Thailand", *Japan and the World Economy,* 14:445-470.

Rose, A.K. (2000), "One money, one market: The effect of common Currencies on Trade", *Economy Policy,* April, 9-45.

Smith, M. (2004), "Impact of the Exchange Rate on Export Volumes", *Reserve Bank of New Zealand: Bulletin,* 67(1), March.

Takaendesa, P., Tsheola, T. and Aziakpono, M. (2005),'Real Exchange Rate Volatility and the Effect on Trade Flows': New Evidence from South Africa, *Economics of Transition, vol. 9 (4), 224-248.*

Tenreyro, S. (2003), "On the Trade Impact of Nominal Exchange Rate Volatility", *Federal Reserve Bank of Boston,* Working paper 03-2.

UK Treasury (2003), "EMU and Trade."available at http://www.hm-treasury.gov.uk/documents/the-euro/assessments/ studeies/ euro.

Umoru, D. and Oseme, A.S. (2013), "Trade Flows and Exchange Rate Shocks in Nigeria: An Empirical Result." *Asian Economic and Financial Review,* 3(7): 948-977.

World Bank, (2009) World Reports, Geneva.

World Trade Organization, (2003), "Trade Restrictions for Balance of Payments Purposes – *Note on Issues raised by Developing Countries in the Doha Round", WT, TF/COH/13, Document number 03-0970* (2/14/2003).

Yoon, G. (2009), "Are Real Exchange Rates more likely to be Stationary during the Fixed Nominal Exchange Rate Regime"? *Applied Economic Letters*. Vol., 16, Pp. 17-22.