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The Effect of Exchange Rate Fluctuation on Foreign Trade in Nigeria

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Abstract:

The study examined the impact of exchange rate fluctuations on foreign trade in Nigeria. The research design for this study was quasi experimental in nature. The study was basically time series based. Data used in the study was generated from the Central Bank of Nigeria and Federal Bureau of Statistics Bulletin. The data used were those of Exchange Rate (EXR), Import (IMP) and Export (EXP) in international price level (PL) and Gross Domestic Production (GDP) from 1980-2014.The statistical tools employed in analyzing the data were; The Ordinary Least Square (OLS), co-integration/ECM and the Granger Causality test methods. The choice of these econometric approaches was premised on the fact that time series data are sometimes pronged to spurious results. The Parsimonious Error Correction Model (ECM) results, indicates that the dynamic model is a good fit. This is so because the variation in the dependent variable account for 56 percent of the total variation in the model based on the R^2. Specifically, the R^2 value of 0.564 indicates that the variation in foreign trade explained by changes in exchange rate (EXR), gross domestic product (GDP) and price level (PL) is 56 percent. Therefore, the explanatory power of the model estimated is 56 percent. This shows a more realistic value of R^2 for the Nigerian economy than the OLS results of 93%. Also, the value of f-statistic at 147.00 in the short run equally reduces to 2.132 and statistically significant at the 5% level. This implies that the overall regression result is significant. The Durbin Watson (DW) value of 1.998, which is approximately 2.0, suggests a lesser level of autocorrelation.The coefficient of the error correction term appears with the right sign (negative) and statistically significant at 5 percent level. This shows that about 55 percent disequilibria in the foreign trade in the previous year were corrected for in the current year. It therefore, follows that the ECM could rightly correct any deviations from short run to long-run equilibrium relationship between Foreign Trade and the explanatory variables (exchange rate, gross domestic product and price level). There is need for diversification of the Nigerian economy to avoid overreliance on one product and reduce importation.

Keywords— **Exchange rate, Equilibrium, price level, liberalization and Diversification**

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INTRODUCTION

1.1 Background to the study

Exchange rate plays an important role in the broad allocation of production resources and spending in the domestic economy between foreign and domestic goods and as well as influences export growth, consumption, resource allocation, employment and private investments (Takaendesa, Isheole and Aziakpono, 2005). Thus, Nigeria as a very large market in foreign trade operates an open economy with other countries of the world with the use of foreign currencies. Foreign/international trade is a trade that cutsinternational boundary of the world and involves the use of foreign currencies. It is also the trade between two or more countries that

makes it becomes possible to exchange the currency of one to another (Udoka and Ubom 2003).Thus, exchange rate is the price of one country's currency expressed in terms of some other currency. It determines the relative prices of domestic and foreign goods, as well as the strength of external sector participation in the international trade. Also, exchange rate fluctuation is the rate of change in price over a given period. It is expressed as a percentage and computed as the annualized standard deviation of the percentage change in the daily price.

A rise in the value of the naira raises the value of the price of Nigerian goods on the international market, while a fall in naira will lower these prices. The fluctuation of exchange rates will make the exports/imports of industrial and agricultural sectors goods costlier or cheaper and also the unstable tendency of this variable attaches a level of uncertainty or risk to trade.Variation in exchange rate leads to uncertainty, which has a negative effect on trade flows. This fluctuation in the exchange rate will create severe macroeconomic disequilibrium, which will lead to balance of payment deficit. The Nigerian economy has been trying to resolve the problem of external and internal balance which is caused by the disequilibrium in our balance of payment and causing the economy balance of payment deficit but the main aim of this currency devaluation was to encourage export thereby improving the economy, however this objective of increasing export through devaluation of the naira has not been achieved, instead despite the various effort of the government to stabilize the exchange rate, the naira has continued to depreciate and making the naira worthless in terms of other country's currency.

Exchange rate regime remain important issues of discourse in the international finance as well as in developing nations, with more economies embracing trade liberalization as a requisite for economic growth (Obansa, Okoroafor, Aluko and Millicent, 2013). In Nigeria, exchange rate has changed within the time frame from regulated to deregulated regimes. Ewa, (2011) agreed that the exchange rate of the naira was relatively stable between 1973 and 1979 during the oil boom era and when agricultural products accounted for more than 70% of the nation's gross domestic products (GDP). In 1986 when Federal government adopted Structural Adjustment Policy (SAP) the country moved from a peg regime to a flexible exchange rate regime where exchange rate is left completely to be determined by market forces but rather the prevailing system is the managed float whereby monetary authorities intervene periodically in the foreign exchange market in order to attain some strategic objectives (Mordi, 2006). This inconsistency in policies and lack of continuity in exchange rate policies aggregated unstable nature of the naira rate (Gbosi, 2005). Benson and Victor, (2012) noted that despite various efforts by the government to maintain a stable exchange rate, the naira has depreciated throughout the 80's to date. Against this background, this research study intends to investigate the impact of exchange rate fluctuation on foreign trade in Nigeria over a period of 1980 – 2014.

1.2 Statement of the Problem

Exchange rate is an important macroeconomic variable used as a parameter for determining international competitiveness and it is being regarded as an indicator of the competitiveness of the currency of any economy and an inverse relationship between this competitiveness exist. The fluctuation of exchange rate can lead to currency appreciation or depreciation. Thus, some public commentators believe that the fluctuation in the exchange rate was due to the implementation of the Structural Adjustment Program (SAP) that required deregulation of foreign exchange market and this deregulation led to the devaluation of the Nigerian naira. Also, low industrialization, non-mechanized farming and poor infrastructural development affected greatly the exportable goods of Nigeria in International Trade. Our basic core products are mainly primary products

and these in volume are exchanged for highly mechanized products or modern technology which has been a high hindrance in our development.Exchange rate fluctuation can affect trade directly, through uncertainty and adjustment costs, and indirectly, through its effect on the structure of output and investment and on government policy as argued by Brodsky, (1984). Yet some studies provide enough information to indicate positive effects of exchange rate fluctuation on trade. The studies are: Morgenroht (2000), Pickard, (2003), Todani and Munyama (2005) and Rey, (2006).The Nigerian government has over the years engaged in international trade and have consistently been designing trade and exchange rate policies to promote trade (Adewuyi, 2005).
Similarly, the over-dependence of the economy on imported capital goods implies that a depreciating exchange rate would definitely crowd out marginal investment as a result of high investment cost (Nnanna, Englama and Odoko, 2004). With the situation in Nigeria where virtually everything is imported this scenario have a lot of effects on the balance of trade (BOT) and Unfavourable balance of payment (BOP).Meanwhile, Obadan (2006) did state that factors that led to the misalignment of the exchange rate in Nigeria includes weak production base, import dependent production structure, fragile export base and weak non-oil export earnings, expansionary monetary and fiscal policies, inadequate foreign capital inflow, excess demand for foreign exchange relative to supply, consistent fluctuations in crude oil earnings, unguided trade liberalization policy, speculative activities and sharp practices (round tripping) of authorized dealers. Also over reliance on imperfect foreign exchange market, heavy debt burden, weak balance of payments position and capital flight. The important question is ‘what are the determinants of the exchange rate in Nigeria, taking into account both short run (actual) and long run (equilibrium) determinants. Thus, the fall in Naira have affected import/export or gains in international trade. The study therefore will critically look at the spread of empirical evidence in the market to sustain our findings. Hence these questions thus; what is the impact of exchange rate volatility and whether the exchange rate have any effect on international trade in Nigeria? Also, what is price level effect on foreign trade?

1.3 Objectives of the Study

The objective of this research is to examine the impact of exchange rate fluctuations on foreign trade in Nigeria.

2.1LITERATURE REVIEW

2.1.1 Theoretical Framework

The paper examined the various theories of international trade in the course of the study. This theories include:The pre-classical theory, the classical trade theory, the modern trade theory, the mint parity theory, the purchasing power parity theory and the balance of payment theory but for the purpose of the study, the study discussed the Mundell-Fleming IS-LM BOP Model and the Mundell-Fleming IS-LM BOP Model and the purchasing power parity theory.

The Mundell-Fleming IS-LM BOP Model

The Mundell-Fleming model is developed by extending the IS-LM model to the case of an open economy, where the capital and good or commodity markets were internationally integrated and this thus provides an understanding of how exchange rate is determined. It is an extension of the IS-LM model, while the ISLM model deals with the closed economy, the mundell - Fleming model tries to describe a closed economy, and this is the key difference between the IS-LM model and the Mundell - Fleming model.The Mundell- Fleming model is an economic model that integrates international trade and finance into macroeconomic theory. This was developed in

the early 1960s by the Canadian economist Robert Mundell (the winner of the 1999 Nobel Prize award in economics) and the British economist, Fleming (1911-1976), they both belonged to the international monetary fund (IMF) research department. The model is a close relative of the IS-LM model, both models assume that the price level is fixed and then shows what causes short-run fluctuations in aggregate income or equivalently, shifts in the aggregate demand curve. The Mundell – Fleming model shows the relationship between the nominal rate and an economy's output in the short run.Note, interest rate is the key component in making both the money market and the good market to be in equilibrium.Under the Mundell – Fleming framework of small economy, interest rate is fixed and equilibrium in both markets can only be achieved by a change in nominal exchange rate.According to the Mundell – Fleming model, an open economy can be described by four equations; the equations are represented thus;

$Y = C(Y-T) + I(r) + G + NX(\varepsilon)$ IS (1)

$e = (1 + i)Ee'/(1 + i^*)$ IRP (2)

$\varepsilon = ep / P^*$ RER. (3)

$r = i - E\,\pi$ FISHER. (4)

The first equation shows the equilibrium in the goods market while the second equation shows the interest rate parity condition which describes equilibrium in the market for foreign exchange, the third equation expresses the definition of the real exchange rate, and the last equation is the fisher equation which expresses the relationship between the real interest rate, the nominal interest rate and the expected inflation. The four equations above determine the equilibrium values for the four endogenous variables which are income (Y), the nominal exchange rate (e), the real exchange rate (ε), the real interest rate (r).In explaining the Mundell – Fleming model, the type of exchange rate adopted is necessary because it can have completely different implications under different exchange rate regimes.

The theoretical framework that will be used for the basis of work is the Mundell -Fleming model also known as the IS-LM-BOP model.

Purchasing power parity Theory of Exchange Rate

The Purchasing Power Parity (PPP) posited that since currencies are valued for what they will buy (purchasing power), the exchange rate between them must equal as the case may be to their relative internal purchasing power which is measured by relative general price levels (Wheatley, 1907).Anyawu (1993), the theory determines the nominal exchange rate and its movements in long-run equilibrium when the trade balance is zero with the underlying real determinants presumed to be constant, conditions and assuming further that all commodities are exportable.

$\Sigma = TP/P^*$

The equilibrium exchange rate is expressed in terms of product in terms of relative price level. There are two versions of the theory; the absolute version and the relative (or comparative) version (Anyawu). The absolute purchasing power parity theory postulates that the equilibrium exchange rate between two countries is equal to the ratio of price levels in the two nations (Salvatore, Ibid).

Specifically $E^X \frac{P_0}{PK}$

Where P is the general price level, PK is that of foreign nation. Note, if the price of one bag of wheat is $1 in the United States and E1 in the European Monetary Union, then the exchange rate between the dollar and the pound should be R=$1/ E1 = 1.

The relative purchasing power parity theory postulates that the refined relation exchange rate over a period of time should be proportional to the relative change in the price levels in the two nations over the same period.

$R_n = \frac{P_n / P_r}{P_n P_k} = RK$

Where n is the subsequent period, K is the basic period, R_n is the exchange rate period in the new period.

2.3 Empirical Literature

The issues of exchange rate and foreign trade have assumed strong prominence in economic literature. For instance, Danladi, Akomolafe, Babalola and Akpan (2015) examined exchange rate volatility and international trade in Nigeria. Using annual data from 1980 to 2013 obtained from World Bank Development Indicators (WDI). Exchange rate volatility, gross national product (GDP), investment, interest rate, import and export were used to capture the causal relationship between exchange rate volatility and international trade and also the long-run and short-run relationship between exchange rate volatility and international trade. The empirical analysis began with testing for stationarity of the variables by applying the Augmented Dickey-Fuller(ADF), this was followed by co-integration test, then the granger causality and the Error Correction Model (ECM). The co-integration test indicated that the variables are co-integrated which implies that a long-run relationship exist between the variables while the granger causality test showed that a causal relationship exist between international trade and exchange rate volatility. It was observed form the ECM analysis that exchange rate volatility negatively affects international trade.

Elif Nuroglu and Robert Kunst (2012) in their paper the effect of exchange rate volatility on international trade flows, evidence from panel data analysis and fuzzy approach. The aim of this paper is to analyse the effect of exchange rate volatility on international trade flows by using two different approaches the panel data analysis and fuzzy logic and also to compare the result. A panel with cross-section dimension of 91 pairs of EU15 countries and with time ranging from 1964 to 2003 was used. An extended gravity model of trade is applied in order to determine the effect of exchange rate volatility on bilateral trade flows of EU15 countries. The estimated impact is clearly negative which indicates that exchange rate volatility has a negative influence on bilateral trade flows.

Yutaka (2013) examined the effects of exchange rate uncertainty and financial development on international trade. Panel data are used to conduct a dynamic panel model and the method for empirical analysis is Ordinary Least Square (OLS) and robust estimation. Sample period is from 2009 to 2011 and the data used is in yearly average. The result are inconclusive, exchange rate volatility does not significantly influence the volume of international trade. Also, the study found out that exchange rate volatility negatively influences international trade in developing countries. As the volatility of exchange rate increases, it dampens international trade.

Orkhan (2010) examined exchange rate volatility and international trade. The main objective of this article is to analysis the effect of exchange rate volatility and different exchange rate regimes on international trade, he used panel data including US trade with large number of countries and fixed effects estimation method, high frequency data and large sample is used. Panel Least Squares method to large sample and up to date data is used to estimate the effect of exchange rate volatility on US import and exports and the different exchange rate regimes are used as

instrument for volatility. High panel data including 79 countries, 276 months covering time period from 1985 to 2007. Significant negative effect of exchange rate volatility on trade is found but this effect is not unambiguous.

Ogbonna (2011) examined the impact of exchange rate variations on trade balance: evidence from Nigeria from 1970-2005. This study tests the ML conditions to see if it is satisfied for Nigeria. It uses the a regression model formulation which include income and real exchange rate, so that absorption approach to balance of payments is also investigated. The econometric procedures used to assess the impact of exchange rate variations on the aggregate trade balance are: Unit root tests (ADF and PP),Johansen and Juselius approach to estimation of multivariate cointegration system and Ordinary Least Square (OLS). The results suggest no co integration for the trade balance model. The results further show that depreciation/devaluation improves trade balance and that Marshall-Learn (ML) condition holds for Nigeria. This is an indication that in Nigeria, exchange rate management may be regarded as a relevant tool for balance of trade adjustment.

Oyovwi and Ukavwe (2013) examined exchange rate volatility effect on trade variations in Nigeria from the period, 1970–2010. The study adopted unitroot and cointegration tests .Empirical results showed that all variables I (I), except import that is I(0) and are significant at 1,5,and 10 percent. Co-integration results revealed that a stable long run equilibrium relationship exists between the variables. Employing error correction modeling, the result revealed that exchange rate volatility is insignificant in explaining variations in imports but significant and positive with respect to export. Also, the result showed that exports have positive and significant impact on imports.

Egwaihide (1999) examined the determinants of aggregate imports and its components in Nigeria, 1953-1989, using co integration and error correction specification. The results indicate that, foreign exchange earnings, relative prices and real income, all significantly determine the behaviour of total import in the reference period. The estimated equation rests on the stock adjustment import exchange rate model that has its roots in the balance of payments theory and in the consumer theory of demand as in the traditional import demand function.

Umoru and Oseme (2013) examined trade flows and exchange rate shocks in Nigeria: an empirical result. The study explored the J-curve effect based on Nigerian data by adopting the vector error correction methodology. The results of the study indicated a cyclical feedback between the trade balance and the real exchange rate depreciation of the Naira. However, the analysis finds no empirical evidence in favour of the short-run deterioration of the trade balance as implied by the J-curve hypothesis. Rather, what is empirically supported is the cyclical trade effect of exchange rate shocks. As it were, a real exchange rate shock will initially improve then worsen and then improve the country's aggregate trade balance. The instant improvement in the trade balance which is correlated with real depreciation provides no support for the J-curve hypothesis in the Nigerian trade balance. Hence, the short-run predictions of the J-curve are not observable in Nigeria.

Olufayo and Fagite (2014) examined the effects of exchange rate volatility on the exports performance of both oil and non-oil sectors. The paper employed the econometrics method of GARCH in measuring volatility of exchange rate and seemingly unrelated regression method

(SUR) in estimating the coefficient of the two system equation. ARCHand GARCH results suggested that the exchange rate is volatile, while SUR model shows that exchange rate hasnegative effect on the two sectors, though statistically not significant.

2.3.1 Exchange Rate Volatility and Trade

The various literature on exchange rate volatility and trade has continued to produce both theoretical and empirical papers, without changing the broad thrust of previous, relatively inconclusive analyses and evidence.(Brollet etaal, 2006), who studied optimum production decisions by an international firms using portfolio theory. It is shown that an increase in exchange rate risk (or expectation thereof) could have a negative, positive or neutral impact on trade. The impact depends upon the elasticity of risk aversion with respect to the standard deviation (or the mean) of the firms random profit.

Klein and Shambaugh (2006), which agrees with the previously mentioned posited that exchange rate volatility and aggregate exports have positive correlation line of thought that defends the existence of a positive effect of currency unions on trade. Eicher and Henn (2009) posited their empirical work and agrees on this. Chitet (2010). Tested the impact of exchange rate volatility of third countries to establish whether a rise in exchange rate volatility between the importing country and other exporting countries encouraged bilateral exports between two trading partners. The findings tend to confirms that not only absolute volatility but also relative volaitility is important for bilateral export flows of emerging economies. They concluded that exchange rate volatility in East Asian economies has a significant negative impact on export flows to the world market. Arinze (2000) focused on the impact of exchange rate volatility on export both in the short and long run.

From Bretton Woods system of fixed but adjustable exchange rates four decades ago, the bulk of economic literature on the relationship between exchange rates and trade deals with the effects of increased variability (volatility) of exchange rates on trade. This is almost exclusively the case until 2004, when the IMF survey was published. This literature has continued until the present, incorporating improvements derived from theoretical refinements (the “new world” trade theory) and new statistical information (firm level data).

The effects of exchange rate volatility on trade, the considerable array of theoretical and empirical literature remains somewhat ambiguous. Taglioni (2002) states, it is customarily presumed that the adverse effect of exchange rate volatility (on trade flows), if it exists, is certainly not large”. Oztruk (2006) has the same position, which reveals a rather wide range of empirical evidence, some in favour and some against the hypothesis of a negative relationship between exchange rate volatility and trade. Coric and Pugh (2010) on average, exchange rate variability exerts a negative effect on international trade.

On the issue of the level of exchange rate (misalignments), theoretical and empirical studies over the years show that the relationship between the level of a currency and trade is so multi-faceted and complex that it is hard to take a firm line in any particular direction. When markets are free of distortions, an exchange rate misalignment has no long run effect on trade flows, as it does not change relative prices. Long run effects are predicted in models that assume market distortions, such as information problems or product market failures. In the short run, when some prices in the economy can be sticky, movements in nominal exchange rates can alter relative prices and affect international trade flows. On the empirical side, the complexity of the relationship between exchange rate misalignments and trade yields mixed findings. For instance, a currency

undervaluation is sometimes found to have a positive impact on exports, but the presence, size and persistence of these effects are not consistent across different studies.

3.1 METHODOLOGY

The research design for this study is quasi experimental in nature.The study is basically time series based. Data used in the study was generated from the Central Bank of Nigeria and Federal Bureau of Statistics Bulletin. The data was annual data that covered the period between 1980 to 2014. The data required were those of Exchange Rate (EXR), Import (IMP) and Export (EXP) in international price level (PL) and Gross Domestic Production (GDP) from 1980-2014.

3.3.1 Techniques of Data Analysis

The statistical tools employed in analyzing the data of this study were; The Ordinary Least Square (OLS), co-integration/ECM and the Granger Causality test methods. The choice of these econometric approaches was premised on the fact that time series data are sometimes pronged to fluctuation that may cumulate into spurious regression result. The econometric software of E-view 8.0 was used in running the model.

The Unit Root Test

A test of stationarity which has become widely popular over the past several years is the unit root test (Gujarati, 2007). The assumption of stationarity of regressors and regressands is crucial for the properties of the OLS estimators. In this case, the usual statistical results for the linear regression model and consistency of estimators hold. But when variables are non-stationary, then the usual statistical results may not hold. Also Granger and Newbold (1974) opined that most time series variables are non-stationary and using non-stationary variable in model might lead to spurious regression.

3.3.3 Johansen Co-integration Test

The basic argument of Johansen's procedure is that the rank of matrix of variables can be used to determine whether or not the two variables are co-integrated. A lack of cointegration suggests that such variables have no long-run relationship. According to Johansen (1998), the general form of cointegration is given by

$$Q_t = \mu + \Delta_1 Q_{t-1} + - - - + \Delta r\, Q_{t-r} + U_t \qquad (i)$$

Where:

Q_t is an nx1 vector of variables that are integrated of order commonly denoted (1) and U_t is an nx1 vector of innovations.

Error Correction Model

If cointegration is proven to exist, then the third step requires the construction of Error Correction Mechanism (ECM) to model dynamic relationship. The purpose of the ECM is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the co-efficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long-run.

The study represent equation (ii) with an error correction form that allows for inclusion of long-run information thus, the ECM can be formulated as follows:

$$Q_t = \alpha_0 + \Sigma\alpha_{1t} X_{t-1} + \Sigma\alpha_{2t} Y_{t-1} + \Sigma\alpha_{3t} Z_{t-1} + \delta_1 ECM_{t-1} + U_{1-t} \qquad (ii)$$

Where;

Q is the dependent variable
X, Y and Z are the explanatory variables

The Granger Causality Test

Granger causality test showed the direction of effect between two time series. Such effect could be bilateral, bidirectional, unidirectional and independence causality. The general form of granger causality is estimated by considering two variables Q and X in the following regressions:

$$Q_t = \sum_{t=1}^{n} \Psi_1 X_{t-1} + \sum_{t=1}^{n} \Omega_1 Q_{t-1} + \varepsilon_{1t} \quad \text{(iii)}$$

$$X_t = \sum_{t=1}^{n} \omega_1 Q_{t-1} + \sum \theta_1 X_{t-1} + \varepsilon_{2t} \quad \text{(iv)}$$

Where it is assumed that the disturbances e_{1t} and e_{2t} are uncorrelated, the two variables case is called bilateral causality. Also, from the Q and X in the equations, unidirectional causality from Q to X exists if the set of lagged X coefficients in ((iii) is not statistically different form zero (i.e., $\Sigma\omega_1 \neq 0$) and the set of the lagged Q coefficients in (iv) is statistically different from zero (i.e., $\Sigma\theta_1 \neq 0$).

3.1.2Model Specification

The model for the study was specified in both the functional and econometric forms below:

FOT = f (EXR, GDP, PL) (3.1)

The explicit form of Equation 3.1 was transformed as follows:

$FOT = \beta 0 + \beta_1 EXR + \beta_2 GDP + \beta_3 PL + u$ (3.2)

$LogFOT = Log\beta_0 + Log\beta_1 EXR + Log\beta_2 GDP + Log\beta_3 PL + u$ (3.3)

Where;
FOT= Foreign Trade
EXR = Exchange Rate (naira to US dollar)
GDP= Gross Domestic Product
Pl = Price Level
$\beta 0 - \beta_3$= are parameters
Log = Natural Logarithm
u =an error term.

4.2 Analysis of Short Run Results

The essence of the OLS results is to determine the short run relationship of the variables in the model. see table 4.2 below for the convectional OLS result

Table 4.2: OLS Regression Results for FOT Model

Dependent Variable: LOG(FOT)
Method: Least Squares
Date: 11/06/16 Time: 21:22
Sample: 1980 2014
Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-4.676010	4.002889	-1.168159	0.2516
LOG(EXR)	1.072602	0.110878	9.673737	0.0000
LOG(GDP)	0.658526	0.333116	1.976868	0.0570
LOG(PL)	-0.081635	0.169549	-0.481486	0.6336

R-squared	0.934323	Mean dependent var	6.786926
Adjusted R-squared	0.927967	S.D. dependent var	2.642480
S.E. of regression	0.709214	Akaike info criterion	2.257891
Sum squared resid	15.59251	Schwarz criterion	2.435645
Log likelihood	-35.51310	Hannan-Quinn criter.	2.319252
F-statistic	147.0021	Durbin-Watson stat	0.564922
Prob(F-statistic)	0.000000		

Source: *Authors' Computed Result from (E-views 8.1)*

5.2. Discussion of OLS Regression Result

The short run result as reported in table 4.2 in chapter four shows that R^2 is 0.934, indicating that the variation in foreign trade (FOT) explained by exchange rate (EXR), GDP and price level is 93 percent. Therefore, the explanatory power of the model estimated is 93 percent. The goodness of the fit of the model is further buttressed by the overall significance of the variable in the model depicted by a high f-value of 147.00with the probability (F-stat=0.000000)

Furthermore, the coefficient of exchange rate (EXR) variable appeared with correct sign (positive) and statistically significant at 5 percent level. This conforms to the apriori expectation. This means that a percentage increase in exchange rate will increase foreign trade in Nigeria during the studied period. Also, the result shows that exchange rate significantly impact on foreign trade in Nigeria during the period of study. The coefficient of gross domestic product (GDP) variable appeared with correct sign (positive) but statistically not significant at 5 percent level. This conforms to the apriori expectation. This means that a percentage increase in GDP will increase foreign trade in Nigeria during the studied period. But the result shows that GDP does not impact on foreign trade in Nigeria during the period of study. Meanwhile, the coefficient of price level (PL) variable appeared with correct sign (negative) but statistically not significant at 5 percent level. This conforms to the apriori expectation. This means that a percentage increase in Price level will decrease foreign trade in Nigeria during the studied period. But price level does not impact on foreign trade in Nigeria during the period of study.

The Durbin Watson value of 0.5649 is far from 2.0. This depicted the presence of serial autocorrelation. The analysis of the short run so far shows that the regression result is spurious. Given a high R^2 of 0.93 and the presence of serial autocorrelation denoted by the DW result. This may be as a result of the non-stationarity of time series data that are used for the study. Therefore, there is need to systematically carry out stationarity (unit root) test and the long run analysis in order to confirm the long run equilibrium of the model.

4.3 Long Run Analysis of Result

Since most short run analyses may be characterized by spurious result, a stationarity test becomes necessary to stabilize the data. However, unit root test in this study is used to investigate whether or not export, exchange rate and price time series are stationary and to find out their order of integration. This was followed by the Johansen co-integration test and the error correction mechanism to determine whether a long run equilibrium relationship exists between the variables.

4.3.1 Unit Root Test for Stationarity (Augmented Dickey Fuller)

Table 4.3: Unit Root Stationarity Test for the Variables

Variables	ADF Test	Critical Value			Order of integration
		1% critical value	5%critical value	10%critical value	
FOT	--4.941547	-3.646342	-2.954021	-2.615817	(1)= 1St Diff.
EXR	-5.909012	-3.646342	-2.954021	-2.615817	(1)=1St Diff.
GDP	-6.750643	-3.646342	-2.954021	-2.615817	(1)=1St Diff.
PL	-5.858367	-3.646342	-2.954021	-2.615817	(1)= 1St Diff.

Source: *Authors' Computed Result from (E-views 8.1)*

4.3.2 Johansen Test for Co-integration

Co-integration is conducted based on the test proposed by Johansen. According to Iyoha and Ekanem, (2002) co-integration deals with the methodology of modeling non-stationary time series variables. For detail result of the Johansen co-integration, see the table 4.4 below.

Table 4.4: Test of co-integration for Foreign Trade Model

Eigen value	Trace Statistics	5% critical value	Prob. **	Hypothesis of CE(s)
0.659938	68.76638	47.85613	0.0002	None *
0.434184	34.25028	29.79707	0.0144	At most 1 *
0.306059	16.02670	15.49471	0.0416	At most 2 *
0.126691	4.334919	3.841466	0.0373	At most 3 *

Source: *Computed Result Using (E-Views 8.1)*

5.4 Discussion of Johansen Co-integration

From table 4.5 in chapter four above, there are four co- integrating equations at 5% level of significance. This is because the Trace Statistic is greater than critical values at 5%. This is strong evidence from the unit root test conducted, where all the variables were stationary at first difference. Therefore, there exists a long-run relationship or equilibrium among the variables. Given that there are four co-integrating equations, the requirement for fitting in an error correction model is satisfied.

4.3.3 Error Correction Model (ECM)

Error correction model (ECM) is a means of integrating the short-run behaviour of an economic variable with its long-run behaviour (Gujarati and Sangeetha, 2008). The table below shows an inference error correction test conducted:

Table 4.5 Over Parameterized ECM of Foreign Trade Model

Dependent Variable: DLOG(FOT)
Method: Least Squares
Date: 11/06/16 Time: 21:28
Sample (adjusted): 1984 2014
Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.584309	0.251304	2.325104	0.0356
DLOG(FOT(-1))	-0.063866	0.219063	-0.291543	0.7749
DLOG(FOT(-2))	0.101223	0.249696	0.405386	0.6913
DLOG(FOT(-3))	0.007041	0.211811	0.033240	0.9740
DLOG(EXR)	-0.113879	0.314344	-0.362273	0.7226
DLOG(EXR(-1))	-0.323608	0.362740	-0.892121	0.3874
DLOG(EXR(-2))	-0.446716	0.358803	-1.245018	0.2336
DLOG(EXR(-3))	-0.311603	0.454598	-0.685449	0.5043
DLOG(GDP)	-0.181841	3.481838	-0.052226	0.9591
DLOG(GDP(-1))	-1.221282	2.816176	-0.433667	0.6711
DLOG(GDP(-2))	-1.741352	2.475996	-0.703294	0.4934
DLOG(GDP(-3))	-0.507442	0.281679	-1.801494	0.0932
DLOG(PL)	0.012496	0.169087	0.073904	0.9421
DLOG(PL(-1))	0.147989	0.151475	0.976982	0.3452
DLOG(PL(-2))	-0.137127	0.162654	-0.843057	0.4134
DLOG(PL(-3))	0.172145	0.165173	1.042214	0.3150
ECM(-1)	-0.585699	0.229898	-2.547649	0.0232

R-squared	0.573254	Mean dependent var	0.234434
Adjusted R-squared	0.085545	S.D. dependent var	0.370216
S.E. of regression	0.354027	Akaike info criterion	1.062960
Sum squared resid	1.754696	Schwarz criterion	1.849340
Log likelihood	0.524125	Hannan-Quinn criter.	1.319300
F-statistic	1.175402	Durbin-Watson stat	2.278195
Prob(F-statistic)	0.384082		

Source: *Computed Result Using (E-Views 8.1)*

Table 4.5 shows the results of the over-parameterized error correction model. The reason for the over-parameterized specification is to show the main dynamic processes in the model and as well sets the lag length such that the dynamic processes would not be constrained by too long a lag length. The over-parameterized is transform in order to achieve the parsimonious ECM to make it more interpretable for policy implementation. The parsimonious error correction result is presented in Table 4.6.

Table 4.6: Parsimonious ECM for Model

Dependent Variable: DLOG(FOT)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.389011	0.188869	2.059686	0.0551
DLOG(FOT(-1))	-0.063953	0.202795	-0.315359	0.7563
DLOG(FOT(-2))	0.069210	0.194070	0.356621	0.7258
DLOG(FOT(-3))	-0.003877	0.195011	-0.019882	0.9844
DLOG(EXR)	0.108886	0.256182	0.425035	0.6761
DLOG(EXR(-2))	0.250928	0.315345	0.795726	0.4372
DLOG(GDP)	1.446262	2.208568	0.654841	0.5213
DLOG(GDP(-2))	0.009187	2.219052	0.004140	0.9967
DLOG(PL)	-0.084333	0.152569	-0.552755	0.5876
DLOG(PL(-2))	-0.123705	0.158975	-0.778138	0.4472
ECM(-1)	-0.551838	0.181108	-3.047006	0.0073

R-squared	0.564151	Mean dependent var	0.234434
Adjusted R-squared	0.454384	S.D. dependent var	0.370216
S.E. of regression	0.360009	Akaike info criterion	1.097076
Sum squared resid	2.203308	Schwarz criterion	1.744683
Log likelihood	-3.004672	Hannan-Quinn criter.	1.308179
F-statistic	2.132719	Durbin-Watson stat	1.998190
Prob(F-statistic)	0.097764		

Source: *Computed Result Using (E-Views 8.1)*

5.5 Discussion of Parsimonious Error Correction Results

The Parsimonious Error Correction Model (ECM) in Table 4.6 above indicates that the dynamic model is a good fit. This is so because the variation in the dependent variable account for 56 percent of the total variation in the model based on the R^2. Specifically, the R^2 value of 0.564 indicates that the variation in foreign trade explained by exchange rate (EXR) , gross domestic product (GDP) and price level (PL) is 56 percent. Therefore, the explanatory power of the model estimated is 56 percent. This shows a more realistic value of R^2 for the Nigerian economy than the OLS results of 93%. Also, the value of f-statistic at 147.00 in the short run equally reduces to

2.132 and statistically significant at the 5% level. This implies that the overall regression result is significant. The Durbin Watson (DW) value of 1.998, which is approximately 2.0, suggests a lesser level of autocorrelation.

Moreover, an important characteristic to be noticed in table 4.6 is the coefficient of the parameter of error correction term. The coefficient of the error correction term appears with the right sign (negative) and statistically significant at 5 percent level. This shows that about 55 percent disequilibria in the foreign trade in the previous year were corrected for in the current year. It therefore, follows that the ECM could rightly correct any deviations from short run to long-run equilibrium relationship between Foreign Trade and the explanatory variables (exchange rate, GDP and price level).

Furthermore, the coefficient of exchange rate (EXR) is rightly signed (positive) but statistically not significant at 5 percent level. The implication of this result is that exchange rate (EXR) and foreign trade are positively related but exchange rate does not impact significantly on foreign trade. It also implies that exchange rate alone will not significantly lead to an increase in foreign trade during the period of study. Therefore, the study rejects the alternative hypothesis and accepts the null hypothesis which says ‘‘there is no significant relationship between exchange rate and foreign trade in Nigeria. This finding indicates that a well-managed exchange rate regime by the monetary authority have the potential to increase foreign trade. The findings conform to the empirical work of Oyovwi and Ukavwe (2013) who examined the effect of exchange rate volatility on trade variations in Nigeria and found that exchange rate is positively related to trade but statistically insignificant with trade.

Also, the coefficient of gross domestic product (GDP) is rightly signed (positive) but statistically not significant at 5 percent level. Meaning that a percentage increase in GDP will boost foreign trade positively. But GDP does not impact significantly on foreign trade. It also implies that GDP alone will not significantly lead to an increase in foreign trade during the period of study. Therefore, the study rejects the alternative hypothesis and accepts the null hypothesis which says ‘‘there is no significant relationship between GDP and foreign trade in Nigeria. The findings conform to the empirical work of Danladi, Akomolafe, Babalola and Akpan (2015) who examined exchange rate volatility and international trade in Nigeria and found that while exchange rate volatility negatively affect international trade, gross domestic product has a positive relationship with international trade.

Moreover, the coefficient of price level (PL) is rightly signed (negative) but statistically not significant at 5 percent level. Meaning that a percentage increase in price level of goods and services will decrease foreign trade. But price level impacts significantly on foreign trade. Therefore, the study rejects the alternative hypothesis and accepts the null hypothesis which says ‘‘there is no significant relationship between price level and foreign trade in Nigeria.

4.3.4 Granger Causality Test

In order to find out the direction of the effect of exchange rate fluctuation on foreign trade, we conducted the Pairwise Granger Causality Test. The results presented on the table 4.7 below

Table 4.7: Pairwise Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
EXR does not Granger Cause FOT	33	3.26218	0.0533
FOT does not Granger Cause EXR		0.01114	0.9889
GDP does not Granger Cause FOT	33	5.74265	0.0081
FOT does not Granger Cause GDP		1.41525	0.2597
PL does not Granger Cause FOT	33	0.22734	0.7981
FOT does not Granger Cause PL		0.44503	0.6453

Source: *Computed Result Using (E-Views 8.1)*

5.6 Discussion of Pairwise Granger Causality Test Results for Export Model

In order to find out the direction of the effect of exchange rate fluctuation on foreign trade, we conducted the Pairwise Granger Causality Test. The results presented on the table 4.7 shows unidirectional causality between the variables; exchange rate variation (EXR) and foreign trade (FOT) as well as gross domestic product (GDP) and foreign trade (FOT). Meaning that exchange rate variation and gross domestic product granger causes foreign trade. This further reveals that the variables exchange rate and gross domestic product are necessary condition for achieving foreign trade. Thus, exchange rate fluctuation and GDP impact on foreign trade in Nigeria during the period of study. Meanwhile, there is an independent causality between price level and foreign trade. Thus, price level does not impact on foreign trade in Nigeria during the period of study.

6.1 Conclusion /Recommendation

From the study it can be concluded that an effective and efficient exchange rate policy and an appropriate exchange rate are crucial for enhancing the economic performance of a country. Exchange rate volatility destabilizes import and export and this in turn affects the economy negatively, so for the purpose of economic development there is need to control or forecast the exchange rate to minimize uncertainty, which destabilizes trade. There is need for diversification of the Nigerian economy to avoid overreliance on one product and reduce importation.The policy implication of the study hinged on the need to steadily control and regulate exchange rate which if not checked will affect the level of export and import. In this regards, the study recommends the exchange rate and trade policies that will promote greater exchange rate stability and trade conditions that will promote domestic production in the economy. This the study believe will enhance non-oil exports and reduce importation. To achieve this, government should deliver efficient infrastructural services especially power supply and other energy resources.

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