



Effect of Volatility in the Naira - Dollar Exchange Rate on the volume of Imports to, and Exports from Nigeria

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ABSTRACT

We analyzed the effect of volatility in the Naira-Dollar exchange rate on the volume of imports to and exports from Nigeria between 1990 and 2019. Data for all variables, except volatility, were sourced from the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), and the International Financial Statistics. The volatility of the naira exchange rate was calculated from the model. The study employed both the autoregressive distributed lagged (ARDL) and exponential generalized autoregressive conditional heteroscedasticity (EGARCH) models to test for the short and long-run relationships between changes in the Naira-Dollar exchange rate and the volume of imports and exports. Volatility in the Naira-Dollar exchange rate was found to be related to the volume of imports to and exports from Nigeria in the long run with no short-run effects because of the pass-through effect to domestic inflation. The study recommends that government should sustain efforts at promoting exports and reducing imports to improve the trade balance. The study brings into perspective another way of looking at the long-run relationship between the Naira-Dollar exchange rate and Nigeria's trade balance.

Keywords: Foreign Exchange Rate, Foreign Exchange Market, Imports, Exports, The Balance of Trade, Nigeria

JEL Classifications: F14, F31, O24

1. INTRODUCTION

Severe fluctuations in the foreign exchange market of countries have caused disruptive tendencies on activities in the real economy (Obstfeld and Rogoff, 1998), especially on the balance sheet of banks with foreign currency exposures. Such disruptive tendencies have led to volatility in the exchange rate with corresponding repercussions on the balance of trade. In addition, the increasing globalization in banking and financial services is creating challenges of high-frequency volatility in the exchange rate, for which countries have responded variedly, depending on the peculiarities of their economies.

The response of most of these countries including Nigeria is to adopt policies that would both reduce the exchange rate volatility¹ as well as achieve some form of internal and external balance in the

macroeconomy. Since a country's international competitiveness is linked to its imports and exports, reducing the high-frequency volatility in the currency exchange rate help in minimizing the adverse balance of trade position, improving the efficacy of monetary policy outcomes, and promoting the efficient delivery of government policies and programs.

Following the introduction, section two contains the review of relevant literature, while section three describes the sources of data and the method of analysis. Section four presents the empirical analysis and results and the discussion of policy implication, while section five concludes with key findings and recommendations.

2. THEORETICAL FRAMEWORK

Studies on Exchange rate volatility and international trade have attracted divergence attentions particularly in developing nations

¹ For a good discussion of the determinants of exchange rate volatility in Nigeria, see Ajao & Igbekoyi (2013).

because of the role of the local currency on the domestic economy and its implications on the external sector, especially like in the Nigerian economy, where, where developments in oil exports seem to impact directly on government operations. Here, frequent changes in the exchange rate are an issue of concern to the government, policymakers, producers, and consumers. The wide spectrum of interest in the subject has sustained a continued rise in studies, to better understand the phenomenon. We review, a few of the studies that tried to establish a relationship between exchange rate volatility and the volume of exports and imports and their conclusions. It is important to note that, while a number of these studies established empirical evidence on the existence of a strong relationship, others did not, with most of them citing differences in economic peculiarities of countries, as explanations for the divergence in results.

Asteriou et al. (2016) analyzed the effects of Exchange Rate Volatility on International Trade in Mexico, Indonesia, Nigeria, and Turkey and the methods of generalized autoregressive conditional heteroscedasticity (GARCH) and autoregressive distribution lag (ARDL) models. They found no long-run relationship between exchange rate volatility and volume of international trade in those countries, except in Turkey, where the amplitude of the volatility was quite minimal. They, however, noted that in the short run, there was a significant causality running from the exchange rate volatility to the volume of exports and imports demand in Indonesia and Mexico; that a unidirectional causality existed from exports demand from Nigeria to the volatility of the Naira-Dollar exchange rate.

Safuan (2017), investigated the impact of exchange rate volatility on exports to the United States, Japan, and China from 1996 to 2016 using unrelated regression and concluded that the volatility of the exchange rate had negative effects on the volume of exports. When they disaggregated the data, it revealed that the volatility of the exchange rate on exports was negative and varied among industries in the countries of study. Also, Alper (2017) examined the impact of exchange rate volatility on Turkey's trade with fifteen European countries from 1971Q1 to 2015Q4 using the GARCH model and the result revealed that the volatility of exchange rate reduced export flows in the short run but had mixed results on imports in the long run. He then concluded that exchange rate volatility did not affect the volume of trade between Turkey and the European countries.

Bahmani-Oskooee and Gelan (2018), examined the long-run and short-run impacts of exchange rate risk on trade flow in twelve African countries from 1971Q1 to 2015Q4, using the ARDL model. The results revealed the presence of a long-run relationship between exchange rate volatility and trade flows in all the selected countries. Latief and Lefen (2018) investigated the relationships between the volatility of exchange rate and international trade and foreign direct investment from 1995 to 2016 for seven developing countries of Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, and Sri Lanka using the GARCH model. Their findings revealed that volatility of exchange rate for Bhutan, Maldives, and Nepal had positive effects on international trade flows, but negative effects for Pakistan and Sri Lanka. However, with the TGARCH model, the study found a significant positive impact of exchange rate volatility on international trade flows for Bhutan, Maldives, and Nepal. That foreign direct investment and exchange rate

volatility also had a significant positive relationship in India and Pakistan but a negative relationship in Bhutan and Nepal. Muhia and Gachunga (2019) examined the effect of exchange rate volatility on exports and imports in Kenya from 1980-2015 using a log-linear multiple regression model and found a significantly strong relationship between them.

Similarly, in a study on Vietnam, Thuy and Thuy (2019) found that exchange rate volatility impacted negatively on the volume of exports in the long run, while a currency depreciation impacted exports negatively in the short run but positively in the long run, suggesting the presence of the J-curve effect in Vietnam. In addition, that an increase in the real income of foreign currencies decreases Vietnamese export volume. Bostan and Firtescu (2019) used Ordinary Least Square (OLS) to analyzed data on Romania. The results revealed that exchange rate volatility was an important determinant of competitiveness but that the influence of uncertainty arising from volatility in the exchange rate seems to be weak on imports but strong on exports.

Ikechi and Anthony (2020) examined the impact of exchange rate volatility on international trade in Nigeria from 1996 to 2018 using the vector autoregression (VAR) model and established a negative relationship between exports, imports, and volatility in the real effective exchange rate (REER). The variance decomposition also revealed that the shocks partially explained fluctuations in exports, imports, and real effective exchange rates. In terms of causality, it revealed that imports granger-caused exports, but exports did not granger-cause imports. The GARCH results also confirm the presence of volatility in the real effective exchange rate (REER) on exports and imports in Nigeria. In a related study on oil price shocks and exchange rate volatility in Nigeria, Tule and Osude (2014) used monthly data for the period 2000 to 2013 and the GARCH and EGARCH methods to establish the existence of a strong relationship between volatilities in oil prices and the real exchange rate in Nigeria Yakubu et al. (2019) used both AGARCH and ARDL models to test for the existence of a long-run relationship between exchange rate volatility and trade flows between 1997 and 2016. Their results revealed that volatility in the exchange rate adversely affected trade flows in the short-run but not in the long-run. A result was worthy of further investigation. Also, Umaru et al. (2013) studied the effect of exchange rate volatility and exports from Nigeria. using ordinary least squares (OLS); the ARCH and GARCH models and concluded that a strong relationship existed between them.

The studies revealed mixed results. That, while most found evidence of a long-run relationship between exchange rate volatility and trade balance, few like Ozturk (2006) had mixed results extending explanations of peculiarities in the economies of countries. This paper offers an alternative approach to analyzing the effect of exchange rate volatility on the balance of trade in Nigeria.

3. METHOD OF THE STUDY

3.1. Data Sources and Variables in the Model

Available data for most of the variables were sourced from the CBN Statistical Bulletin (2019) and NBS (2021) for the period 1990 to 2019. The data on the real effective exchange rate in

Nigeria was from the International Financial Statistics (2017; 2021), publications of the IMF. The period covered was, largely based on data availability.

The main variables used for the analysis includes total exports (EXPT) (free on board), total imports (IMPT) (free onboard), the Naira -US dollar rate (EXRV), the rate of inflation (INFLA), the balance of trade (BOT) and the gross domestic product (GDP)

3.2. Choice of Model and Estimation Procedure

The study used both statistical and econometric techniques to analyze the data. The summary statistics of the data were used to look at the nature of the data in terms of the description of one variable with other variables in the model. Then we carried the ADF unit root test to establish their stationarity or otherwise. We then estimated the general format of the model specified in equation (1) below using OLS before applying the ARDL technique. The study then employed the exponential generalized autoregressive conditional heteroscedastic (EGARCH) (1,1) model to generate the volatility series through the variance equation and the ARDL Bounds tests to establish long-run relationships. The EGARCH model was better than basic GARCH since the log (conditional variance) is modeled, then even if the parameters are negative, the log of conditional variance will be positive². The EViews 11 software was used for the analysis.

3.3 Model Specification

This study employs the Exponential (EGARCH) method to model volatility in the exchange rate due to the shortcomings of GARCH. The model was originally developed by Nelson (1991) to capture any asymmetric effect of the shock and to ensure that the variances were positive. Kamal et al. (2012) emphasized that the effects of a shock on the volatility are asymmetric. That is, it could be good news or positive past residuals or bad news which could be a negative lagged residual, though bad news tends to exert more influence on volatility than good news. The natural logarithm of the conditional variance was used in the EGARCH. The GARCH (p, q) model is given as

$$\log(\delta_t^2) = \alpha_0 + \Psi_1 \left[\frac{\mu_{t-1}}{\delta_{t-1}} \right] + \Psi_2 \log(\delta_{t-1}^2) + \Upsilon \frac{\mu_{t-1}}{\delta_{t-1}} \quad (1)$$

Where δ_t^2 is the conditional variance of exchange rate series for the study period, $\left[\frac{\mu_{t-1}}{\delta_{t-1}} \right]$ is the ARCH term showing the magnitude of past shocks to volatility in the exchange rate and the degree of volatility clustering,

δ_{t-1}^2 is the GARCH term, $\left[\frac{\mu_{t-1}}{\delta_{t-1}} \right]$ is the ARCH component showing leverage effect,

α_0 is the constant, and ψ_1 is the coefficient of asymmetry, ψ_2 is the coefficient of persistence, while Υ is the leverage coefficient showing the leverage effect. where negative returns (shocks) are

2 This means that, there will be no need for us to artificially impose non-negative restrictions on the parameter coefficients of the model.

expected to produce higher volatility than positive returns of the same magnitude which further confirms the role of asymmetry and μ_t is the error term that is uncorrelated with its past values.

As earlier pointed out, the advantage of the EGARCH model is that since the log (conditional variance) is modeled, then even if with negative parameters, the log of conditional variance will be positive. This means no need for non-negative restrictions on parameter coefficients of the model. Furthermore, to establish short and long-run relationships between exchange rate volatility and exports and imports, we follow after Bahmani-Oskooee and Sami (2019), who had separate specifications for imports and exports. The dynamic Autoregressive Distributed Lag (ARDL) model of Pesaran et al. (2001) are as shown in equations 2 and 3 below.

$$\begin{aligned} \Delta EXPT_t &= \beta_0 + \beta_1 EXPT_{t-1} + \beta_2 EXRV_{t-1} + \beta_3 INF_{t-1} \\ &+ \sum_{i=0}^q \beta_4 \Delta EXPT_{t-1} + \sum_{i=0}^q \beta_5 \Delta EXRV_{t-1} \\ &+ \sum_{i=0}^q \beta_6 \Delta INF_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \end{aligned} \quad (2)$$

$$\begin{aligned} \Delta IMPT_t &= \alpha_0 + \beta_1 IMPT_{t-1} + \alpha_2 EXRV_{t-1} + \alpha_3 INF_{t-1} \\ &+ \sum_{i=0}^q \alpha_4 \Delta IMPT_{t-1} + \sum_{i=0}^q \alpha_5 \Delta EXRV_{t-1} \\ &+ \sum_{i=0}^q \alpha_6 \Delta INF_{t-1} + \lambda ECM_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

Were.

EXPT = Exports, IMPT = Imports, EXRV = Exchange rate volatility, and INF = Inflation rate

β_0 and α_0 are the constant or intercept terms

$\beta_1-\beta_6$ and $\alpha_1-\alpha_6$ are the parameter estimates.

Δ = difference operator, q = lag length and ε_t = serially uncorrelated error term.

λ = speed of adjustment parameter and ECM = the error correction term.

The coefficient of the lagged error correction term (λ) is expected to be negative and statistically significant to show that short-run disequilibrium will be corrected in the long run.

4. MODEL RESULTS AND DISCUSSIONS

The study begins the analysis of the results with a discussion of the summary statistics followed by correlation analysis of the relationship among the variables, especially the correlation between the balance of trade (BOT) and real effective exchange rate (REER) in Nigeria.

The summary statistics results in Table 1 show that the mean score of BOT is positive and the largest followed by EXPT, REER, and INF while that of IMPT is also large but negative. The standard deviation (also a proxy for volatility) for all the variables except

Table 1: (a) Summary statistics and correlation analysis

	EXPT	IMPT	BOT	REER
Mean	6478.374	-4232.701	10711.08	107.7390
Median	5924.655	-2407.900	8371.630	99.77986
Maximum	18707.60	-39.77100	31160.60	272.9200
Minimum	109.8860	-12453.00	149.6570	49.73297
Std. Dev.	5894.174	4171.878	9933.457	50.97531
Skewness	0.446312	-0.572478	0.464526	1.851841
Kurtosis	1.816639	1.711772	1.747381	6.108070
Jarque-Bera	2.746400	3.713071	3.040238	29.22171
Probability	0.253295	0.156213	0.218686	0.000000
Sum	194351.2	-126981.0	321332.3	3232.169
Sum Sq. Dev.	1.01E+09	5.05E+08	2.86E+09	75355.99
Observations	30	30	30	30

(b): Correlation Matrix Analysis

Correlation	EXPT	IMPT	BOT	REER	INF
Probability					
EXPT	1.000000				

IMPT	-0.946079	1.000000			
	(0.0000)	-----			
BOT	0.990702	-0.981353	1.000000		
	(0.0000)	(0.0000)	-----		
REER	-0.033254	-0.013019	-0.014264	1.000000	
	(0.8615)	(0.9456)	(0.9404)	-----	
INF	-0.409663	0.374235	-0.400252	-0.019841	1.000000
	(0.0246)	(0.0416)	(0.0284)	(0.9171)	-----

The values in the parentheses are the probability values.

INF, tends to be large, suggesting high volatility levels. The correlation matrix as reported in the lower part of Table 1 indicates that, apart from the positive correlations between EXPT and BOT and between IMPT and INF, all the other correlations had negative correlations. The positive correlations suggest that the higher the export, the higher is the balance of trade, and the higher the imports, the higher the level of inflation. More so, of particular importance is the balance of trade and the real effective exchange rate that are negatively related, suggesting that as the real effective exchange rate reduces, the balance of trade improves.

The study generated an exchange rate volatility series using the GARCH approach and replaces the real effective exchange rate, to ascertain the actual impact of the exchange rate volatility on both exports and imports.

Precursory to the application of the cointegration and the ARDL long-run and short-run analysis, we check for the unit root properties of the variables using the Augmented Dickey-Fuller test and establish that all the variables (EXPT, IMPT, INF) except EXRV are stationary at I(1) (Table 2). The EXRV is however stationary at a level I(0). The mixed order of integration of the results further buttresses the application of the ARDL model in this study.

The results of the Bounds cointegration test in Table 3 indicate the absence of cointegration or long-run relationship between exchange rate volatility and exports as shown in model 1 and between exchange rate volatility and imports as shown in model 2. These decisions are based on the fact that the value of the F- statistic of the models is less than the upper critical bounds. Cointegration exists in a model when the value of the F-statistic

Table 2: Results of ADF Unit Root test

Variable	ADF and level	ADF and 1 st Diff	Order of integration
EXPT	-1.73100 (0.1090)	-5.6244(0.000)	I(1)
IMPT	-0.30442 (0.9126)	-5.7321(0.000)	I(1)
EXRV	-5.10690 (0.000)	-	I(0)
INF	-2.02758 (0.2740)	-4.35859 (0.0019)	I(1)

The values in the parentheses are the probability values

is greater than the upper critical bounds of the ARDL. Hence, we conclude that there is no long-run relationship among the variables. To this effect, the study takes the difference of the series and estimates the short-run relationship and the results are presented in Tables 4 and 5 respectively.

Tables 4 and 5 present short-run results of the relationship between exchange rate volatility on exports and imports respectively, given that no long-run relationship was found to exist among the variables for both models.

The results indicate that exchange rate volatility has a positive but statistically insignificant effect on both exports and imports in the short run. The insignificance of the positive effect entails that, exchange rate volatility is not a strong determinant of both exports and imports in the short run. Both exporters and importers are not guided by exchange rate volatility in making short-run decisions. This may be due to the pass-through price effect of increases in Domestic prices arising from exchange rate volatility, that the producers pass onto the consumers. Also evident from the results is that inflation has a negative but also statistically insignificant effect on both exports and imports. This also explains the fact that inflation is not a strong determinant of exports and imports in the

Table 3: ARDL bounds test

	F-statistic	Lower and upper critical values						Decision
		1%		5%		10%		
		I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
Model 1 $EXPT_f(EXRV, INF)$	0.79238	4.95	6.03	3.48	4.34	2.85	3.62	No Cointegration
Model 2 $IMPT_f(EXRV, INF)$	0.71035	4.95	6.03	3.48	4.34	2.85	3.62	No Cointegration

I(0) and I(1) represent lower bounds and upper bounds respectively

Table 4: Short-run estimates of the effect of exchange rate volatility on exports

Dependent Variable: EXPT				
Variable	Coefficient	Std. error	t-statistic	Prob.
EXRV	0.002288	0.024813	0.092216	0.9272
INF	-1.450873	36.56067	-0.039684	0.9686
C	423.3133	454.3825	0.931623	0.3601
R-squared	0.000410	Mean dependent var		433.9384
Adjusted R-squared	-0.076482	S.D. dependent var		2277.649
S.E. of regression	2363.144	Akaike info criterion		18.47107
Sum squared resid	1.45E+08	Schwarz criterion		18.61251
Log likelihood	-264.8305	Hannan-Quin criter.		18.51537
F-statistic	0.005330	Durbin-Watson stat		1.625570
Prob(F-statistic)	0.994685			

Table 5: Short-run estimates of the effect of exchange rate volatility on imports

Dependent Variable: IMPT				
Variable	Coefficient	Std. Error	t-statistic	Prob.
EXRV	0.003708	0.012015	0.308619	0.7601
INF	-0.610146	17.70353	-0.034465	0.9728
C	-369.8823	220.0226	-1.681110	0.1047
R-squared	0.003773	Mean dependent var		-352.4217
Adjusted R-squared	-0.072860	S.D. dependent var		1104.751
S.E. of regression	1144.289	Akaike info criterion		17.02065
Sum squared resid	34044337	Schwarz criterion		17.16210
Log-likelihood	-243.7995	Hannan-Quinn criter.		17.06495
F-statistic	0.049238	Durbin-Watson stat		2.112373
Prob(F-statistic)	0.952043			

short run in Nigeria. The coefficient of determination measured by R-squared in both results, although low, indicated that exchange rate volatility and inflation rate are weakly correlated with the volume of exports and imports in Nigeria and therefore may not fully explain the effect of short-run volatility in the Naira-US dollar exchange rate on variations in the volume of exports and imports in Nigeria. This implies that, apart from exchange rate volatility, the volume of imports and exports in Nigeria is also influenced by other factors, outside the exchange rate.

5. CONCLUSION AND RECOMMENDATIONS

The study investigated the effect of exchange rate volatility on exports and imports in Nigeria during the period 1990 to 2020. Summary statistics and correlation analysis of the data were carried

out to determine the relational properties of the time series data. The analysis revealed a negative relationship between exchange rate volatility and the balance of trade in Nigeria.

Also, the results of the ARDL Bounds test indicated the absence of cointegration for both the exports and imports models. That, there is no long-run relationship between exchange rate volatility and exports from, and between exchange rate volatility and imports to Nigeria. To this effect, the study focused on the short-run analysis and found that exchange rate volatility is also not a strong determinant of both exports and imports given the insignificant nature of its parameter coefficient in both relationships. The study, therefore, concluded that, although there is no short-run relationship between the Naira-US dollar exchange rate and the balance of trade in Nigeria due to the pass-through effect of exchange rate volatility on domestic prices, there appeared to be indeed a long-run relationship between volatility in the exchange rate and the volume of imports and exports in Nigeria during the period 1990 to 2020. This implies that government should sustain current efforts at increasing the volume of exports from Nigeria and reducing the volume of imports to the country, to positively impact the balance of trade. That although exchange rate volatility did not appear to impact the trade balance directly, there was a pass-through effect on domestic prices. So government should support the currency exchange rate with complimentary monetary and fiscal policy measures, to minimize its volatility and improve the balance of trade.

REFERENCES

- Alper, A.E. (2017), Exchange rate volatility and trade flows. *Fiscaoeconomia*, 1(3), 14-39.
- Asteriou, D., Masatci, K., Pilbeam, K. (2016), Exchange rate volatility and international trade: International evidence from the MINT countries. *Economic Modelling*, 58, 133-140.
- Bahmani-Oskooee, M., Gelan, A. (2018), Exchange-rate volatility and international trade performance: Evidence from 12 African countries. *Economic Analysis and Policy*, 58, 14-21.
- Bahmani-Oskooee, N.R., Sami, S. (2019), Exchange-rate volatility and Commodity trade between the U.S, AND Germany: Asymmetry analysis. *International Economics and Economic Policy*, <https://doi.org/10.1007/s10368-019-00455-0>.
- Bostan, I., Toderasçu, C., Firtescu, B.N. (2018), Exchange rate effects on international commercial trade competitiveness. *Journal of Risk and Financial Management*, 11(2), 19-29.
- Central Bank of Nigeria CBN. (2006), Foreign Exchange Manual. Abuja, Nigeria: Central Bank of Nigeria.
- Central Bank of Nigeria CBN. (2019), Annual Statistical Bulletin. Abuja, Nigeria: Central Bank of Nigeria.
- Ikechi, K.S., Anthony, N. (2020), Exchange rate volatility and international trade in Nigeria. *International Journal of Management Science and*

- Business Administration, 6(5), 56-72.
- Kamal, Y., UI-Hag, H., Ghani, U., Khan, M.M. (2012), Modeling the exchange rate volatility, using generalized autoregressive conditionally heteroscedastic (GARCH) type models: Evidence from Pakistan. *African Journal of Business Management*, 6(8), 2830-2838.
- Latief, R., Lefen, L. (2018), The effect of exchange rate volatility on international trade and foreign direct investment (FDI) in developing countries along “one belt and one road”. *International Journal of Financial Studies*, 6(4), 86-97.
- Muhia, J., Gachunga, M.J. (2019), Effect of exchange rates volatility on exports and imports in Kenya. *Mediterranean Journal of Basic and Applied Sciences*, 2(4), 102-108.
- National Bureau of Statistics NBS. (2021), Reports. Available from: <https://nigerianstat.gov.ng/elibrary>
- Nelson, D.B. (1991), Conditional heteroskedasticity in asset returns: A new approach. *Econometrica: Journal of the Econometric Society*, 59, 347-370.
- Obstfeld, M., Rogoff, K. (1998), Risk and Exchange Rates. Working Paper, No. 6694, National Bureau of Economic Research.
- Ozturk, I. (2006), Exchange rate volatility and trade: A literature survey. *International Journal of Applied Econometrics and Quantitative Studies*, 3, 85-102.
- Pesaran, M.H., Shin, Y., Smith, R.J. (2001), Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289-326.
- Safuan, S. (2017), Exchange rate volatility and export volume: The case of Indonesia and its main trading partners. *European Research Studies Journal*, 10(3A), 3-13.
- Thuy, V.N.T., Thuy, D.T.T. (2019), The impact of exchange rate volatility on exports in Vietnam: A bounds testing approach. *Journal of Risk and Financial Management*, 12(1), 1-14.
- Tule, M.K., Osude, D. (2014), Oil price shocks and real exchange rate movement in Nigeria. *Economic and Financial Review*, 52(1), 29-45.
- Umaru, A., Sa'idu, B.M., Musa, S. (2013), An empirical analysis of exchange rate volatility on export trade in a developing economy. *Journal of Emerging Trends in Economics and Management Sciences*, 4(1), 42-53.
- Yakubu, M.U., Obiezue, T.O., Aliyu, V.O. (2019), The volatility of exchange rate on trade flows in Nigeria, *Economic and Financial Review*, Central Bank of Nigeria. *Economic and Financial Review*, 57, 23-46.