EXCHANGE RATE VOLATILITY AND VOLUME OF IMPORTS IN NIGERIA (POST COVID 19 EFFECT)

[1]Justin C. Alugbuo, [2]Emeka Eze & [3]Obinna Osuji

[1,2,3]Department of Economics, College of Management Sciences (COLMAS), Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria

Abstract

The study investigated exchange rate volatility and volume of imports in Nigeria for the period 1981-2020. The main objective of the study was to determine effect of exchange rate volatility on volume of imports in Nigeria. The study utilized annual time series data obtained from World Development Indicators (WDI) and Central Bank of Nigeria statistical bulletin for the period 1981-2020 with the help of the Auto Regressive Distributive Lag (ARDL) model of estimation. Results showed that official exchange rate volatility had a positive and insignificant relationship in the current year with volume of imports. In the 1st year lag, official exchange rate volatility had a positive relationship and significant relationship with volume of imports in Nigeria but it was insignificant in the long run; non-oil imports had a positive relationship with the volume of imports in the current and 1st year period and also in the long run at 5% level of significance. Based on these findings, the study recommended that Nigeria Government should do everything economically possible to strengthen the value of Naira in the FOREX market. This however should exclude pumping billions of dollars into the FOREX market as this only creates a temporary economic condition while efforts should be made to ensure exchange rate stability in order to stabilize Nigeria's economy to recover fully from the post effect of Covid 19 global pandemic of 2020.

***Keywords:** Exchange Rate Volatility, Volume of Imports, Covid 19 Pandemic*

BACKGROUND TO THE STUDY AND STATEMENT OF THE PROBLEM

Since the early 1970s, when the Bretton Woods fixed exchange rate regime collapsed, the study of exchange rate volatility had been actively studied empirically (Crosby, 2000). Exchange rate volatility is a statistical indicator of an exchange rate's tendency to rise or fall rapidly within a short period of time. In macroeconomic policy formulation, investment decisions, and foreign trade flows, exchange rate volatility i.e. nominal/real exchange rates generates confusion (Cote, 1994).

The exchange rate policy in Nigeria had fluctuated between the fixed exchange rate system and a market based (flexible) exchange rate system. The fixed exchange rate system was introduced during the post-independence era in 1960 while the market based exchange rate system was introduced from 1986 during the structural Adjustment Programme (SAP) era.

There have however, been controversies in respect to production of goods and services under the flexible and fixed exchange rate system. Several exchange rate reforms which had been introduced were aimed at setting the Nigerian economy on the path of macroeconomic stability, recovery and sustainable development (Bakare, 2011). The

economy has however degenerated in terms of macroeconomic performances where several exchange rate regimes had brought in exchange rate volatilities and uncertainties especially in regards to oil price fluctuations which became worst during the spread of COVID 19 pandemic of 2020.

There are two possible explanations for exchange rate volatility; the first reflects the exchange rate's systemic movement, while the second reflects exchange rate fluctuations. Savings, lending rates, and inflation are all affected by exchange rate fluctuations, which have an effect on economic prosperity and development. Nigeria's foreign exchange policies have evolved over time. It has evolved from a fixed exchange rate mechanism that was exclusively connected to the British Pound in 1960. The US dollar was included in the parity scheme in 1967, following the fall of the British Pound. Owing to the emergence of the stronger US dollar, the parity scheme with the Pound Sterling was suspended by 1972 in 1973, Nigeria returned to the fixed exchange rate system linked to the British pound as a result of the US dollar devaluation. In 1974, the Naira was tied to both the pound and dollar. During the 1970s, there were frequent increases in value of the naira occasioned by increases in the price of crude oil in the world market. This led to over-reliance on imports, capital flight and reduction of non-oil exports. This created balance of payments imbalance and depletion of external reserves. This also led to the demise of critical sectors of the economy such as the agricultural sector (Osaka, Masha & Adamgbe 2003). In 1978, the Nigerian currency was pegged to a basket of 12 foreign currencies. This was however neglected in 1985 in favour of quoting the naira against the dollar.

Before 1986, the exchange rate policies created the problem of over-valuation of the naira. In a bid to solve this problem, the naira was deregulated in September 1986 under the Structural Adjustment Programme (SAP). The Second-tier Foreign Exchange Market (SFEM) was therefore established to enhance the SAP. SFEM was expected to create a mechanism for determination of exchange rates in order to provide stability in the short term and ensure balance of payments equilibrium in the long run. The objectives of SFEM was to achieve a realistic naira exchange rate through the market forces of demand and supply, improve foreign exchange inflow and discourage outflow, create an efficient allocation of resources, stimulate non-oil exports, reduce currency trafficking by wiping out unofficial parallel foreign exchange market (Mordi, 2006).

Bah and Amusa (2013) opines that international trade is the exchange of capital, goods, and services across international borders or territories. It is the exchange of goods and services among nations of the world. In most countries, such trade represents a significant share of gross domestic product (GDP).There have been a lot of studies trying to explain the relationship between exchange rate variation and volume of trades in Nigeria. However, most studies conducted in the last decade have been unable to identify the extent of exchange rate fluctuations increase or decrease the risk and uncertainty associated with trade in Nigeria. As such, there have been difficulties in understanding the impact of exchange rate fluctuations in increasing or decreasing the uncertainty associated with trade (import and export) in Nigeria especially when the whole world had experienced one of the most deadliest pandemic in the year 2020 whereby free movement from one country to another had been totally restricted, inflicting more damages to the exchange rate parity of naira and dollar as Nigeria as a country wholly depends on imported capital goods and consumers for their survival.

Nigeria's import is dominated by non-oil component consisting largely capital goods and raw materials. The value of non-oil import averaged ₦0.02 billion between 1986 and 1990. It grew gradually to ₦0.53 billion, ₦1,411.71 billion ₦3,792.14 billion during 1996-2000, 2001-2005 and 2006-2010, respectively as a result of increased demand to complement the Industrialization drive of the government. Non-oil import maintained its upward trend averaging ₦6,751.28 billion and peaked at ₦8,613.94 billion from 2011-2014 and 2015, respectively. It however dropped to ₦6,643.09 billion in 2016 as a result of the demand management policies adopted by the CBN, high inflationary pressure and the depreciation of naira which made import more expensive (CBN 2017).

Figure 1: Trend Movement of Import Volume in Nigeria 1981-2020

Source: *Researcher's Compilation from World Development Indicators*

The fig 1 above is an enough prove to show that over the years 1981 to 2020, the value of imports has been consistently varying as a result of variations in macro-economic variables in the economy over the years. It is evidence that interest rate, exchange rate and inflation among other macro-economic variables has been under serious fluctuations, prompting the constant upward and downward intercept trend in the values of import in the country. Observing fig 1, it could be seen that the volume of imports of Nigeria from 1981 was the highest, sitting at 483 percent increase before going down to the all-time low of 70% in 1987 as a result of the various trade policies introduced in the country while peaking again in 2008 at 362%, 408% in 2014, 414% in 2019 and back to 364% in 2020 as a result of the Covid 19 global pandemic.

Conversely another major predicament facing the country's importation is the regular devaluation of the naira where some scholars attributed this economic unfriendly incidence as an economic resource curse. It is against this relevant economic hazard that impedes the growth and sustainability of the exchange rate movement in the country thereby necessitating the need to investigate relative effectiveness of exchange rate volatilities on volume of imports in Nigeria in the presence of the recent economic recovery as a result of the global Covid 19 pandemic aftereffect.

CONCEPTUAL CLARIFICATIONS

Exchange Rate

Exchange rate is a reflection of the strength of a currency when measured against another country's currency (Oloyede, 2012). In the Nigerian context, it is the units of naira needed to purchase one unit of another country's currency e.g. the United States dollar (Campbell, 2010). No currency is allowed to float, so nation monetary authorities regulate currency between the fixed and floating exchange rate systems and other regimes, such as dual managed. Fluctuations in exchange rate will cause weak purchasing power and hence, negatively impact on investment in import of inputs Onyeizugbe and Umeagugesi (2014)

Exchange Rate Management and Import Variation in Nigeria

The concern with exchange rate management policy in Nigeria can be traced back to 1960 when the country became politically independent, even though the Central Bank of Nigeria and the Federal Ministry of Finance had come into being two years earlier (Ogiogio, 1995). Management of exchange rate can be traced to two divisions/phases; pre-Structural Adjustment era of 1960-1985 and post-Structural Adjustment era 1986 – till date.

Nigeria's Foreign Exchange Regimes Management and its Volatility

Nigeria's foreign exchange rate was fairly stable from 1980 to1985: at ₦0.5464, ₦0.61, ₦0.6729, ₦0.72, ₦0.76, and ₦0.89 to a US $ in 1980, 1981, 1982, 1983, 1984 and 1985 respectively. The introduction of the structural adjustment in 1986 depreciated to naira exchange rate to ₦2.02, ₦4.01, ₦4.5, ₦7.39, ₦8.03, ₦9.9, ₦17.298, ₦22.3 and ₦21.88 to a US $ in 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993 and 1994 respectively. In 1995, the Central Bank of Nigeria (CBN) interviewed six times in the Autonomous Foreign Exchange Market (AFEM), meeting inn full the US $1.748 billion demanded by this market. The inability of some end-users to effectively back their foreign exchange demand with naira deposit at the CBN, led to the allocation of the US $1.748 billion. This action stabilized both the Autonomous Foreign Exchange Market and the Parallel Market Rates; converging and stabilizing at US $1 to ₦82.3and US $1 to 83.7 respectively. The CBN (1995) attributed this to its "guided depreciation" policy adopted at the beginning of that year which allowed it to intervene periodically at the AFEM at marketed- determined rates.

In 1996, the CBN maintained dual exchange rate with the official rate at ₦22/US $ and the AFEM rate averaging ₦82.5/US $1. The CBN intervention policy of 1995 was retained in 1996 to further stabilize the naira exchange.to enhance the naira rate stability, the CBN continued the suspension of the use of bills of collection and open accounts for import financing: the requirement that all imports into the country be accompanied by duly completed form as well import dully reports (IDRS). In 1997, the dual exchange rate system was retained with the official exchange rate at ₦21.997/ US $1; while the AFEM rate was ₦85/ US $1. The naira exchange was ₦84.4/ US $1 and ₦88.1/ US $1 in the AFEM and parallel markets respectively in 1998.

In 1999, the foreign exchange management in Nigeria transited from the autonomous foreign exchange market to the inter-bank foreign exchange market (IFEM). During the year, the CBN intervened in the foreign exchange market 43 times against 51 times in 1998. IFEM rate in the year averaged ₦92.3/ US $1; while the bureau-de-change rate (BDC) averaged ₦92.26/ US $1, reducing the parallel market premium to 3.2%. The exchange rate of the naira depreciated in all segments of the foreign exchange market in 2000. At the IFEM, the naira depreciated on the average by 6.5% to ₦101.65/ US $1. The rate was relatively stable during the first nine months of the year, but depreciated thereafter against US $. A higher level of depreciation was experienced in the parallel market falling by 10.7%.

In 2001, the naira depreciated in both the IFEM and the BDC. At the IFEM, the naira exchanged at ₦111.96/US $1. A sharp initial depreciation of the naira was experienced at the IFEM in January 2001, stabilizing in the remaining part of the year. A steeper depreciation of the naira was experienced in the BDC market with an appropriate decline of 10.32% to ₦132.57. The CBN (2001) attributed this decline to increase in demand for foreign exchange at $14.7billion and inflows reducing to US $15.7 billion; caused by increased funding of the IFEM, external debt service payments and fall in oil receipts. Exchange rates at the IFEM and BDCs in 2002 were ₦121/US $1 and ₦137.57/US $1 respectively. CBN (2014)

Figure 2: Trend Movement of Official Exchange Rate in Nigeria 1981-2018
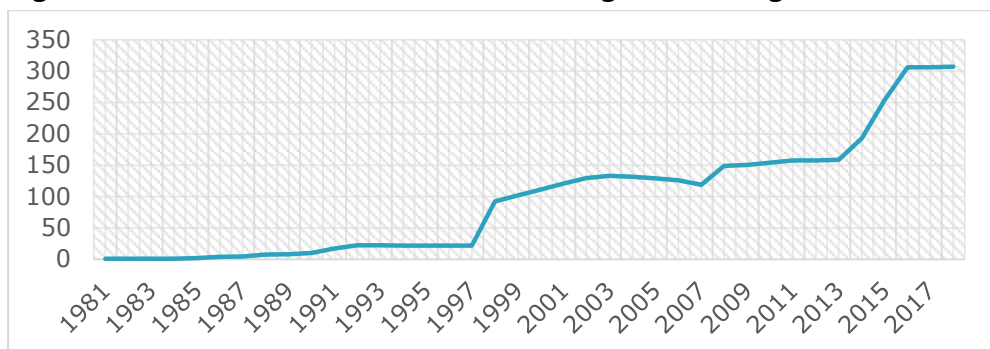
Source: *Researcher's Compilation from World Development Indicators*

The graphical illustration of the variations inherent in the exchange rate in the country over the period 1981 to 2017 provides us with relevant evidence on the volatility of exchange rate in the economy during this period, which could be grossly attributed to import dependent rate of the economy, lack of local production and inappropriate management of the exchange rate in the country over this investigative period. The graph proves a horizontal trend from the year 1981 to 1991, which was the era of structural adjustment program in the country, as exchange rate management in the economy was strict through the adoption of exchange rate pegging, when the naira was pegged against the united-state dollar during this period, which prompted the relative stability of the naira. From 1991 to 2017, the country witnessed an upward trend in the exchange movement, which could grossly be accredited to political issues, mono product economy activities oriented, hence the huge dependence on oil revenue in the country.

Non-Oil Import

Export is a catalyst necessary for the overall development of an economy. The primary objective of export policies in any economy is to increase the level of economic activities. It follows, therefore that export policies should be directed to the sector in which the impact of an increase in export demand will be both desirable and large. It is a source of foreign exchange earnings and since trade transaction followed by the —oil boom period which arose from oil glut in the world oil market since 1981 only led to the neglect of non-oil export productive base. This has also led to panic measures by successive government from the economic stabilization Act of 1982. Counter trade policy of Buhari/Idiagbon regime and the introduction of structural adjustment programme (SAP) by the Babangida Administration hence the need to diversify the export base of the economy. Prior to the phenomena emergence of the oil sector, Agriculture is one of oldest occupations in Nigeria and has been the main slay of the Nigerian economy contributing 80% of the export earnings and 75% of the Gross Domestic Product (GDP).

Consequently, this position has fallen consistently to date, the attendant fluctuation in the non-oil export promotion, the world prices of agriculture and manufacture products and the emergence of oil have helped in no small measure in diverging the role of agriculture in the nation's development. This situation is worsened by the almost total neglect of the agricultural sector. The Nigerian economy has not recovered from the resultant disequilibria in both domestic and external sectors, this has therefore brought about the need for adjustment in Nigeria to diversify and restructure the productive base of the economy in order to reduce its dependence on oil export. It is this concerns the country non-oil exports (CBN 2019).

Theoretical Literature Review

Purchasing Power Parity

Purchasing Power Parity is an economic theory that compares different countries' currencies through a basket of goods approach. It is an approach that takes cognizance of differences in countries' rates of inflation relative to the purchasing power of their currencies. That is, a persistent high inflation rate would make the prices of locally produced commodities more costly relative to foreign substitutes. As a result of this, there would be increased flair for foreign products; hence, foreign currencies to purchase them.

Consequently, the surge for foreign currencies would raise the value of the foreign currencies at the expense of the domestic currency; leading to reduction in value of the nation's currency. The lower the value of the nation's currency, the higher and more expensive would be the value of the foreign currencies; leading to increased costs of exchange. The more the costs of exchange increase, the less would the production lines consume foreign inputs.

The tendency is that increased costs of production would lead to increase in prices of products, reduced outputs, labour retrenchments, loss of profits, or total closure of operations at the lowest ebb of the strata. At the highest ebb of the strata, influencing the rate of exchange could boost production, enhance employment, increase profit margin or creation of a new production line. Summarily, the purchasing power of nations' currencies, upon which inflation weighs great influence, plays a key role in determining the side of the pendulum that foreign exchange rate swings.

Balance of Payments Theory

In the words of Herbert Stein, The balance-of-payments accounts of a country record the payments and receipts of the residents of the country in their transactions with residents of other countries. If all transactions are included, the payments and receipts of each country must be equal. Any apparent inequality simply leaves one country acquiring assets in the others. The balance of payment position of a country equally weighs great influence on the nation's currency. While balance of payments deficit necessitates payments in foreign currency, its surplus ensures foreign currency receipts. More receipts of foreign currencies impact positively on enhancing the value of the national currency, while persistent balance of payments deficit impacts negatively and often leads to devaluing the nation's currency.

The more the nation's currency losses its value, the more expensive it becomes for firms and industries to import necessary factors of production that are not available locally. Tendency is that an industry that majorly depends on foreign inputs may suffer loss. This is simply due to the fact that exports generally would become comparatively costlier and may not be fully able to increase sales to cover anticipated profit margins.

To correct balance of payments deficits, the right approach would be to increase dominance in foreign trade so that more foreign earnings could be engendered. Such an increase may necessitate a push from the public sector. Directions and standards have to be pre-determined and enforced by the government that knows of the nation's state of accounts. In line with this, the tenets of endogenous growth theory ought to be keenly promoted (Aghion and Howitt, 1992). The output effect of exchange rate changes has been a subject of theoretical debate in the literature without consensus as to the direction of the effects. The traditionalist argued that exchange rate depreciation would promote trade balance, alleviate balance of payments difficulties and accordingly expand output and

employment provided the Marshall-Lernar conditions are met (that if the sum of price elasticity of demand for export and the price elasticity of demand for imports is greater than unity).

The monetarists on the other hand argued that exchange rate changes have no effect on real variables in the long run. The monetarist view is that exchange rate devaluation affects real magnitudes mainly through real balance effect in the short run but leaves all real variables unchanged in the long-run (Domac, 1977). This approach is based on the assumption that the Purchasing Power Parity (PPP) holds. It predicts that in the short run an increase in the exchange rate leads to increase in output and improves the balance of payments but in the long run, the monetary consequence of the devaluation ensures that the increase in output and improvement in BOP is neutralized by the rise in prices.

One other theoretical linkage between exchange rate and output in the literature is the IS-LM model. The main advantage of this model over some other models is that it includes consumption, investment, government spending, taxes, exports, imports, interest rate, exchange rate, current account, capital account and national output in a single framework. In this model, exchange rate does not affect output directly, it affects it indirectly through the import-export and the money supply channels. Depreciation is theoretically expected to have positive effect on export since it makes domestic goods cheaper to foreign consumers.

Empirical Literature Review

Musa, Nuhu (2021), examined the effect of exchange rate volatility on inflation in Nigeria using annual time series data covering the period 1986-2019. The study used consumer price index as a proxy for inflation being the dependent variable while nominal exchange rate (NER), money supply (MS) import (IMP) and export (EPT) were used as the independent variables. The results of stationarity test indicated that the variables have mixed order of integration and bounds test for co-integration confirmed the existence of a long-run relationship among the variables. Findings showed that money supply (MS) and nominal exchange rate (NER) had positive and significant effect on consumer price index, meaning that inflation in Nigeria is caused by exchange rate fluctuations as well as increase in money supply.

Nguse et.al (2021), investigated the impact of the Ethiopian exchange rate and its volatility on international trade. Trade openness was used as a proxy for international trade in the study. The study's general objective was to investigate how international trade responds to exchange rate levels and volatility. The study relied solely on secondary time-series data spanning the years 1992 to 2019. The Autoregressive Distributive Lag (ARDL) model was used in the study to investigate the long-term relationship between exchange rate level, volatility, and international trade performance. An error correction model was used to estimate the variables in the short term. The finding of the study implies that: in the short term, the exchange rate level was found to negatively and significantly influence international trade.

Nuraddeen U, Ibrahim S & Mukhtar T. (2021), showed empirical evidence of the link between the real exchange rate volatility and the trade balance in the light of financial development, confirming the assertion that the effect is significantly dependent on the country's level of financial development. The empirical estimation was based on the Nigeria's data set spanning the years 1980–2019, and it employed threshold autoregressive non-linear co-integration and non-linear ARDL estimation techniques. According to the

findings, financial development magnifies the beneficial benefits of the real exchange rate on Nigeria's foreign trade. It also states that the uncertainty in foreign capital flows has a negative impact on Nigeria's international trade.

Alugbuo and Nwanguma (2020), investigated effect of exchange rate volatility and the relative effectiveness of monetary and fiscal policies on economic growth of Nigeria for the period 1981-2018, with the help of Autoregressive Distributive lag Model to determine the level of impact that one variable has on the other. While E-views 10 statistical software was employed in computing the result, time series data were obtained from World Bank national accounts data and OECD National Accounts data files and the study established that Exchange Rate Volatility (EXRVT) is ineffective on its effect and influence on economic growth (RGDP) of Nigeria, Broad Money Supply (LM2) had a negative a positive relationship with economic growth (RGDP) in the short run and in the long run at 5% level of significance while Inflation Rate (INFR) had a negative and statistical relationship with RGDP in the current year and also in the long run at 5% level of significance and finally, Total Government Expenditure (LTGEXP) had a negative relationship with RGDP in the short run and in the long run but statistically insignificantly at 5% level of significance.

Jehan and Irshad (2020) investigate experimentally how real exchange rate (RER) misalignment impacts Pakistani economic development. The fully modified ordinary least squares technique reveals that financial growth helps to mitigate the negative effects of real exchange rate misalignment but not completely eradicating it. As a result, it is necessary to investigate the function of financial development in the exchange rate-trade connection. Finally, the overall effect of misalignment on the amount of international trade is evaluated using direct and indirect effects. Our findings will aid in determining the significance of financial development in mitigating the negative impact of RER mismatch on international trade.

Yakub et al. (2019) investigated the impact of exchange rate volatility on trade flows in Nigeria using annual time series data for the period 1997-2016. A GARCH model was used to generate the nominal exchange rate volatility series. To detect the long-run relationship among variables, the ARDL bounds test approach was employed. Also, the Granger causality test was applied to ascertain the direction of causality among the variables. The study found that exchange rate volatility affected Nigeria's trade flows negatively in the short-run but does not in the long-run.

Ndubuaku et.al (2019), investigated the impact of exchange rate fluctuation on selected economic sectors of the Nigerian economy. The study covered the agricultural (AGDP), manufacturing (MGDP), petroleum (PGDP) and service sector (SGDP) of the Nigerian economy. The petroleum sector represented the oil sector while the agricultural (AGDP), manufacturing (MGDP), and service sector (SGDP) represented the non-oil sector. The time scope covered 1981-2016. Data for the study were obtained specifically from CBN statistical bulletin (2016). The data were analyzed using the Auto Regressive Distributed Lagged (ARDL) model. The study concluded that there was no significant impact of exchange rate on AGDP, MGDP and SGDP respectively. However, there was a positive and significant impact of exchange rate on PGDP

METHODOLOGY

Research Design

For the purpose of this study, the ARDL estimation technique was used to investigate the short and long run coefficients of the variables of interest while the Autoregressive

Conditional Heteroscadasticity (ARCH) was used to estimate exchange rate volatility series. Based on the nature of this research study, secondary was used and the design is the ex-post facto which is a research after the factor has been known.

Theoretical Framework and Model Specification

The monetary approach to exchange rate determination postulates that the relative supply of the demand for money between two countries is the basis for the determination of exchange rate. It views increase in the supply of money as being able to generate inflation, hence, resulting in exchange rate depreciation. The model opines that a situation of falling prices with a given nominal money supply results in exchange rate depreciation while traditional flow model is essentially based on the principle of the interplay of demand and supply. The forces of the market determine the rate of exchange. However, when there is speculation or expectation of a change in the rate of exchange, this could lead to the disequilibrium even without any change in the initial determined factors. Exchange rate can adversely affect the ability to import, hence affecting the manufacturing sector output. Fluctuations in exchange rate will cause instability in purchasing power and hence, negatively impact on investment in import of manufacturing inputs.

The model construct for this study is therefore fashioned according to the work of Nuraddeen et.al (2021) where they showed empirical evidence of the link between the real exchange rate volatility and the trade balance in the light of financial development, confirming the assertion that the effect is significantly dependent on the country's level of financial development. According to the findings, financial development magnifies the beneficial benefits of the real exchange rate on Nigeria's foreign trade. It also states that the uncertainty in foreign capital flows has a negative impact on Nigeria's international trade. Their model was as follows:

$$TRD=f(FD,EXR,FGU)………………………………………..(1)$$

Where TRD represented Nigeria's international trade, FD represented the financial development, EXR stands for exchange rate volatility measured; FGU denoted the financial globalization uncertainty**.**

To empirically analyse and capture the study's objectives, the ARDL model specification was used because it is preferable when dealing with variables that are integrated in different orders i.e. I(0), I(1), or a combination of the two, and is robust when the underlying variables has a single long run relationship (bounds test).

There are two steps to the ARDL bounds testing technique. The Bounds test, which compares the F-statistic value to the I(0) and I(1) bounds, is used to test for a long-run relationship, followed by short-run parameter estimation using the dynamic Unrestricted Error Correction Model (UECM) by a simple linear transformation. The UECM blends the short-run dynamics with long-run equilibrium without compromising long-run information. As a result, the ARDL-UECM specification for equation II is as follows:

$$\Delta IMPVD_t = \alpha_0 + {}_1\Delta IMPVD_{t-i} + {}_1\Delta EXRVT_{t-J} + {}_1\Delta TOP\_GDP_{t-K} + {}_1\Delta NOIMP_{t-L} + {}_1\Delta INFLR_{t-M} + \beta_1 IMPVD_{t-1} + \beta_2 EXRVT_{t-1} + \beta_3 TOP\_GDP_{t-1} + \beta_4 NOIMPt_{-1} + \beta_5 INFLR_{t-1}$$
$$………………………………………………II$$

WHERE:

IMPVD(Y) = Import Volume Index as a proxy for Volume of Imports; TOP_GDP = Trade openness; INFLR = Inflation rate; NOIMP = Non Oil Import; EXRVt = Exchange Rate volatility

C_0 = Constant Variable or Intercept; Φ= Short Run Dynamic Coefficients of the Model's Convergence to Equilibrium ; Δ = Short Run Dynamic Coefficients; Є = Error Term.

RESULTS

(ARCH) estimate for Official Exchange Rate Volatility

**Table 1: Derivation of Official Exchange Rate Volatility**

Dependent Variable: OEXCR

Method: ML ARCH - Normal distribution (BFGS / Marquardt steps)

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	6.238395	1.027515	6.071343	0.0000
OEXCR(-1)	1.032559	0.008118	127.1978	0.0000
Variance Equation				
C	0.165080	0.809083	0.204034	0.8383
RESID(-1)^2	4.636466	1.425199	3.253207	0.0011

Source: *Computed by the Researcher from Eviews 11 software output*

To check for the presence of ARCH effect (Volatility), based on the decision rule of the presence of ARCH when b1 ≠ 0 and statistically significant, we therefore conclude that there is presence of ARCH in Official Exchange Rate in Nigeria since our RESID(-1) has a positive coefficient of 4.636466 and statistically significant at 5 % level of significance. We derived the volatility time series for official exchange rate by extracting the GARCH variance series to generate the volatility in official exchange rate for the period 1981-2020.

Figure 3: Movement of Official Exchange Rate Volatility
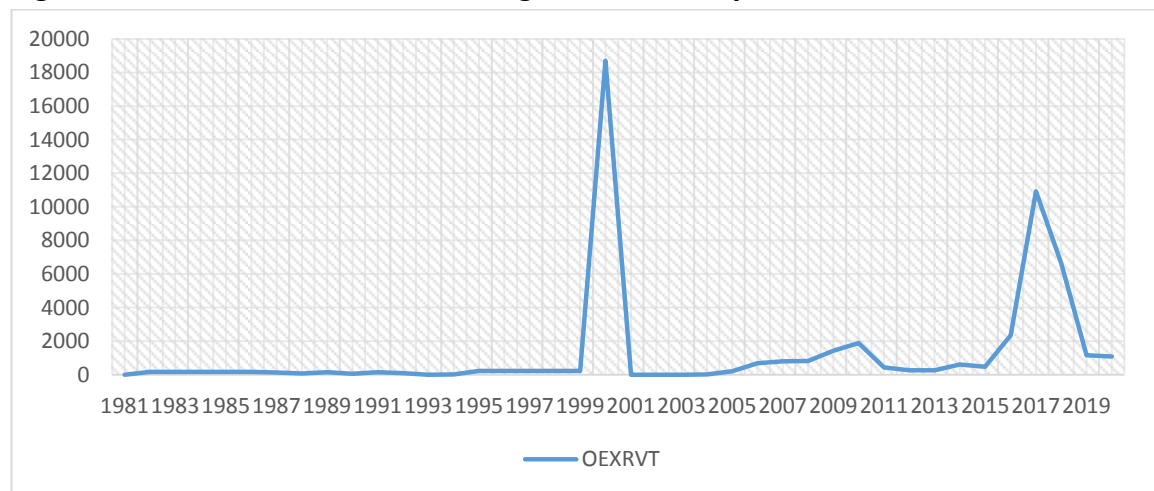
Source: *Researcher's Compilation, 2022*

Figure 3 reveals volatile movement of official exchange which occurred in the year 2000, 2010 and 2017.

Descriptive Statistics

The purpose of the preliminary analysis was to determine the data's normality, measures of central tendency, and measures of dispersion. The mean and median are central tendency metrics that represent the sample's average value. The positive square root of variance is standard deviation. It is a measure of dispersion, or the extent to which the deviation from the mean differs from the mean. The Jarque-Bera test's null hypothesis states that the distribution is normal. We reject the null hypothesis if the probability is less than 0.05.

Table 3: Common Sample Descriptive Statistics

	lnIMPVD	lnNOIMP	INFLR	TOP_GDP	OEXRVT
Mean	5.210979	13.38912	18.95254	32.48585	1320.812
Median	5.284187	13.95447	12.55496	34.02388	224.1839
Maximum	6.193529	16.98380	72.83550	53.27796	18696.20
Minimum	4.140939	8.634407	5.388008	9.135846	0.166210
Std. Dev.	0.690334	2.600762	17.08635	12.24035	3486.160
Skewness	-0.057704	-0.480890	1.809608	-0.393370	3.925756
Kurtosis	1.409650	1.921587	5.053016	2.351106	18.37885
Jarque-Bera	4.131615	3.392992	28.13461	1.690038	484.5023
Probability	0.126716	0.183325	0.000001	0.429549	0.000000
Observations	39	39	39	39	39

Source: Researcher's Extract from Eviews 11 2022

From Table 3, the result of the descriptive statistics showed that the standard deviation calculated for Official Exchange Rate Volatility (OEXRVT), Inflation Rate (INFR) and Trade Openness Percentage of GDP (TOP_GDP) were the most volatile in the series with values of 3486.160, 17.08635 and 12.24035 respectively while Import Volume Index (lnIMPVD) and Non-Oil Imports (lnNOIMP) were the least volatile variables with values of 0.690334 and 2.600762 respectively. The calculated values for the skewness statistics values of lnIMPVD, lnNOIMP and TOP_GDP were negatively skewed, suggesting that their distributions have a long-left tail while the skewness statistics values for OEXRVT and INFLR variables were positively skewed, suggesting that their distributions have a long right tail. Based on these observations, it therefore means that there is unit root (non-stationarity) in the series. Thus, estimating these variables at level might not give good results, hence, the need to conduct the unit root test.

Table 4: Summary of Stationarity Test Using Augmented Dickey Fuller

Varaible	ADF Stat (levels)	5% Critical Value	Prob. Value	ADF. Statistic. 1st Difference	5% Critical Value	Prob. Value	General Remark
lnIMPVD	-1.608275	-3.544284	0.7305	-5.639131*	-2.951125	0.0000	@I(1)
OEXRVT	-3.123606*	-2.941145	0.0332	-	-	-	@I(0)
lnNOIMP	-0.765364	-2.941145	0.8174	-7.78895*	-2.941145	0.000	@I(1)
TOP_GDP	-2.846115	-2.948404	0.0622	-2.667881*	-1.950687	0.0091	@I(1)
INFLR	-2.958757*	-2.938987	0.0479	-	-	-	@I(0)

Source: Researcher's Compilation from Eviews 11 Regression Output (2022)
The asterisks (*) sign is used to indicate stationarity at the 5% significance level

The application of unit root tests in autoregressive distributed lag (ARDL) technique is necessary in order to ensure that the variables are integrated of order one and none of the variables is integrated of order 2 because the computed F-statistic provided by Pesaran & Shin (2001) are valid for only variables that are I(0) or I(1) and a combination of both. The outcome of the unit root test in Table 2, above indicated that LNIMPVD, LNNOIMP and TOP_GDP were integrated of order I(1) while OEXRVT and INFLR were integrated of order zero 1(0). Therefore, the variables under study are of mixed integration order and this justified the use of ARDL bounds test approach to co-integration over other conventional approaches that require the variables to be integrated of the same order.

Cointegration Test

Table 5: Bounds Test for Cointegration

Test Statistic	Value	k
F-statistic	42.20908	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	1.9	3.01
5%	2.26	3.48
2.5%	2.62	3.9
1%	3.07	4.44

Source: Researcher's Extract from Eviews 11.

From the ARDL Bounds Test and going by the decision rule of the Bounds Test, we cannot accept the null hypothesis of no cointegration since the F-Bounds Statistic of 4 is greater than the I (0) and I (1) bounds at 10%, 5% and 1% respectively, therefore we conclude that there exists a long run relationship among the variables.

Dynamic Parsimonious Short Run ARDL Error Correction Model

Table 6: ARDL Error Correction Model Estimates

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(lnIMPVD(-1))	-0.169527	0.075528	-2.244568	0.0403**
D(lnIMPVD(-2))	-0.367485	0.078590	-4.675960	0.0003*
D(lnNOIMP)	0.221303	0.081038	2.730857	0.0155**
D(lnNOIMP(-1))	0.395091	0.079039	4.998663	0.0002*
D(TOP_GDP)	-0.005616	0.003223	-1.742385	0.1019
D(TOP_GDP(-1))	-0.022687	0.004058	-5.590926	0.0001*
D(TOP_GDP(-2))	0.006559	0.002887	2.271876	0.0382**
D(INFLR)	-0.001471	0.002081	-0.706864	0.4905
D(INFLR(-1))	-0.009048	0.002602	-3.477707	0.0034*
D(INFLR(-2))	0.006439	0.002730	2.358637	0.0323**
D(INFLR(-3))	0.004637	0.002000	2.317744	0.0350**
D(lnOEXRVT)	0.016119	0.011473	1.404895	0.1804
D(lnOEXRVT(-1))	0.048127	0.012525	3.842446	0.0016*
D(lnOEXRVT(-2))	-0.005976	0.011307	-0.528533	0.6049
D(lnOEXRVT(-3))	0.032680	0.010396	3.143458	0.0067*
CointEq(-1)	-0.341962	0.033112	-10.327328	0.0000*
R-squared	0.961498	Mean dependent var		-0.005595
Adjusted R-squared	0.912729	S.D. dependent var		0.335063
Durbin-Watson stat	2.176482			

Source: Researcher's Compilation from Eviews 11.
*Significance at 1%, **Significance at 5% level of significance

Import Volume Index (lnIMPVD): Analysis of the short run coefficients of LNIMPVD is negatively signed and statistically significant in the 1st lag and 2nd lag period, decreasing itself by 0.169527 and 0.367485 units.

Non-Oil Import (lnNOIMP): Analysis of the short run coefficient of LNNOIMP had a positive relationship with Import Volume Index (LNIMPVD) in in the current and 1st year period, increasing LNIMPVD significantly by 0.221303 and 0.397485 units significantly at 5% level of significance.

Trade Openness (TOP_GDP): Analysis of the short run coefficient of TOP_GDP had a negative and insignificant relationship with LNIMPVD in the current year. In the 1st year lag, TOP_GDP had a negative and significant relationship with LNIMPVD but was found to positively contribute to LNIMPVD in the 2nd year and significant at 5% level of significance.

Official Exchange Rate Volatility (lnOEXRVT): Analysis of the short run coefficient of Official Exchange Rate Volatility (LNEXRVT) had positive and insignificant relationship with IMPVD in the current year. In the 1st year lag, Official Exchange Rate Volatility had a positive relationship and significant relationship with LNIMPVD by increasing LNIMPVD significantly by 0.048127 units on the average. In the 2nd year Official Exchange Rate had an insignificant negative relationship with LNIMPVD but contributed positively to Import Volume Index in the 3rd year at 5% level of significance.

CointEq(-1): The significance and rule of Error Correction Mechanism (ECM) holds that negative and statistical significant error correction coefficients are necessary conditions for any disequilibrium to be corrected. In light of this, the coefficient of CointEq(-1) is -0.341962. The above result showed that the ECM (-1) value is -0.34% implying that there is convergence of the equilibrium should there be system disequilibrium. The negative sign of the coefficient satisfied one condition while the fact that its P-value [0.0000] is less than 5% [0.05] level of significance satisfied the second condition of statistical significance. The coefficient indicates that the speed of adjustment between the short run dynamics and the long run equilibrium is 34%. Thus, ECM will adequately act to correct any deviations of the short run dynamics to its long-run equilibrium by 34% annually. This means that if IMPVD is at disequilibrium, it converges back to equilibrium at an average speed of about 34% every year in Nigeria.

R-Squared (R^2): R-squared of 0.961490 indicated that 96% of the total variation in volume of imports is accounted and explained by Non Oil Imports (lnNOIMP), Trade Openness (TOP_GDP), Inflation Rate (INFLR) and Official Exchange Rate Volatility (lnOEXRVT). However, the total variation of 4% in the dependent variable is attributable to the influence of other factors not included in the regression model.

Static Long Run Estimates of Exchange Rate Volatility and Volume of Imports in Nigeria

Table 7: ARDL Long Run Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
lnNOIMP	0.268558	0.037669	6.787730	0.0000*
TOP_GDP	0.042348	0.011423	3.707250	0.0021*
INFLR	-0.024262	0.006117	-3.966165	0.0012*
lnOEXRVT	0.035149	0.046883	0.749718	0.4650

Source: Researcher's Compilation from Eviews 11.
* Significant at 1% level of significance

Non-Oil Imports (lnNOIMP): Analysis of the long run coefficient of LNNOIMP had a positive relationship with IMPVD, increasing LNIMPVD by 0.268558 units significantly at 5% level of significance.

Official Exchange Rate Volatility (lnEXRVT): Analysis of the long run coefficient of Exchange Volatility had a positive relationship with LNIMPVD in the long run but was statistically insignificant at 5% level of significance.

Trade Openness (TOP_GDP): Analysis of the long run coefficient of Trade Openness Percentage of GDP had a positive relationship with LNIMPVD in the long run and statistically significant at 5% level of significance.

Diagnostic Test/Post Estimation Test

Breusch-Godfrey Serial Correlation LM Test

The standard errors and variances of the variables estimated in the model are affected by serial correlation in the error term, confounding inference. The study used a

serial correlation LM check for autocorrelation in the error term entering the model to prevent this problem. The test's outcome is shown in the table below.

Table 8: Result Breusch-Godfrey Serial Correlation LM Test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.272757	Prob. F(2,13)	0.7655
Obs*R-squared	1.409018	Prob. Chi-Square(2)	0.4944

Source: *Researcher's Extract from Eviews 11 Output package*

From Breusch-Godfrey Serial Correlation LM Test table, the null hypothesis of no serial correlation cannot be rejected as the p-value from the LM serial correlation test is 0.4944 > 0.05 level of significance indicating an acceptance of the null hypothesis.

Breusch-Pagan-Godfrey Heteroskedasticity Test

Heteroscedasticity is when the ordinary least squares rule is broken. The error terms' variance is homoscedastic, which means they have a constant variance, according to the regression assumption. Simply defined, heteroskedasticity occurs when the error terms' variance is not constant across all X values. The study used a Breusch-Pagan-Godfrey Heteroskedasticity Test in the error term entering the model to prevent this issue. The test's outcome is shown in the table below.

Table 8: Result of Breusch-Pagan-Godfrey Heteroskedasticity Test

Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	0.193015	Prob. F(20,14)	0.9995
Obs*R-squared	7.564865	Prob. Chi-Square(20)	0.9944

Source: *Researcher's Extract from Eviews 11 Output package*

From Breusch-Pagan-Godfrey Heteroskedasticity result, the null hypothesis of no serial correlation cannot be rejected as the p-value from the Heteroskedasticity Test is 0.9944 > 0.05 level of significance indicating an acceptance of the null hypothesis.

Stability Test

Ramsey Reset Test

The Ramsey Regression Equation Specification Error Test (RESET) is a general linear regression model specification test. It examines if non-linear combinations of the fitted values aid in the explanation of the response variable.

Table 9: Result of Ramsey Reset Test

| Ramsey RESET Test			
	Value	**df**	**Probability**
t-statistic	0.109285	14	0.9145
F-statistic	0.011943	(1, 14)	0.9145

Source: *Researcher's Extract from Eviews 11 Output package*

From the RESET test result, the null hypothesis of no specification error cannot be rejected as the p-value from the RESET F-test is 0.9145 > 0.05 level of significance indicating an acceptance of the null hypothesis.
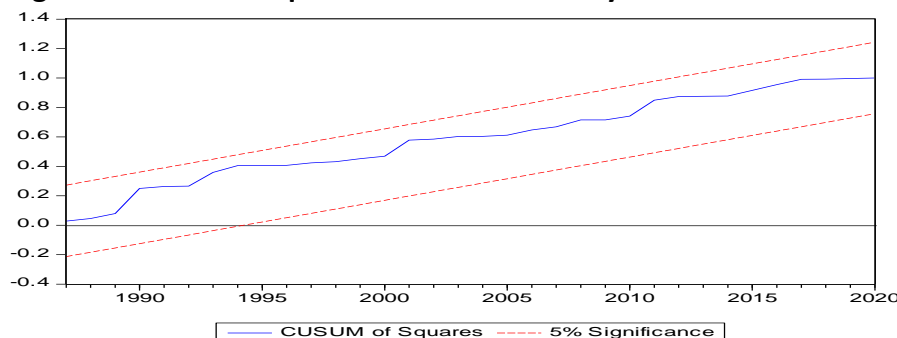
Cumulative and Cumulative Squares Test

The cusum and cusum of squares for model stability was employed to check for the stability of the parameters in the model. The result of the stability test is shown below:

Figure 4: Cusum Test for Model Stability
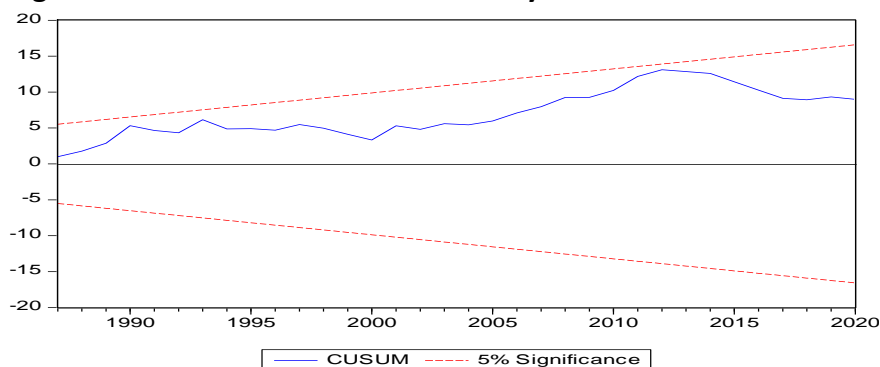
Figure 5: Cusum of Squares for model stability

The cusum and cusum squares diagrams shows that the model is stable as the cusum line lies in between the 5% boundary.

DISCUSSION OF FINDINGS

Effect of Official Exchange Rate Volatility on the Volume of Imports in Nigeria

Official Exchange Rate Volatility (lnEXRVT) was found to have a positive and insignificant relationship with volume of import in the current year. In the 1st year lag, official exchange rate volatility had a positive relationship and significant relationship with volume of import but insignificant in the long run. This result is not surprising since Nigeria adopted the floating exchange regime which are highly volatile as higher volatility in exchange rates increases the exchange rate risk that financial market participants face. Another major reason for the positive significance of the exchange rate fluctuations is because of the obvious hazardous economic effect caused by the global Covid 19 pandemic in 2020 which rendered trade between countries redundant while shutting down various borders of the foreign countries in order to prevent the wide spread of the pandemic, which unavoidably affected Nigeria imports thereby hitting the GDP of the countries significantly. Additionally, floating exchange rates could aggravate existing problems in an economy if the country is already experiencing economic problems such as higher inflation or unemployment, floating exchange rates may make the situation worse as it is our case in Nigeria. Dickson et al. (2019) gave credence to this finding when they applied the error correction and GARCH model to investigate the impact of exchange rate fluctuations on trade variations in Nigeria using annual time series data from 1970 to 2010. The results of the study showed that exchange rate volatility is not significant in explaining variations in import, but was found to be statistically significant and positive in accounting for variations in export.

Effect of Non-Oil Imports on the Volume of imports in Nigeria

Non-Oil Imports (lnNOIMP) was found to have a positive relationship with the Import Volume Index (lnIMPVD) in in the current and 1st year period and in the long run at 5% level of significance. Importing raw materials and goods is one of the paths of increasing the profit margins. There are number of benefits in importing the goods, such as high quality, low prices, and benefits related to the international trade. An importer can have the comparative advantage which means lower prices (Jones, 2006). Also the importer can have the much cheaper products from the foreign market due to low labor cost, low taxes etc. in terms of quality, the importer can have the higher quality goods and produce the finished goods with high quality and extend the business profit margins. In some countries, government provides the support to the importer for developing the trade relations (Nelson and Winter, 2007). A key reason that companies all over the world choose to import goods is to extend their profit margin. High taxes, wage minimums, and material costs in certain countries make it more useful to import products from a country where fees, wages, and material costs are considerably lower. Certain products can cost upwards of 50% less to grow, manufacture or produce abroad. This situation is particularly common when importing goods where natural resources are abundant.

Effect of Trade Openness on the Volume of Imports in Nigeria

Trade Openness (TOP_GDP) was found to have a negative and insignificant relationship with volume of imports in the current year. In the 1st year lag, TOP_GDP had a negative and significant relationship with lnIMPVD but was found to positively contribute to lnIMPVD in the 2nd year and significant at 5% level of significance and also in the long run. Trade openness is an indispensable enabler of growth, job creation, and poverty reduction. Trade provides new market opportunities for domestic firms, stronger productivity, and innovation through competition. It contributes to poverty reduction, stronger wages, geopolitical benefits derived from deeper economic integration, and even on the personal level, increased individual choice and freedom. The obvious reason for the negative insignificance of trade between Nigeria and other foreign was wholly felt in the 2020 as a result of restrictions in trade movements and engagement between countries as a result of the 2020 Covid 19 pandemic because no country has developed successfully in modern times without harnessing economic openness to international trade, investment, and the movement of people. This is especially relevant for smaller countries as rarely has any country with less than 10 million people reached high income status with less than 50 percent of exports in GDP.

SUMMARY OF FINDINGS

The study investigated relative effectiveness of exchange rate volatility on the volume of import in Nigeria for the period 1981-2020. The specified model was estimated using the ARDL model to determine the level of impact that one variable has on each other. While E-views 11 statistical software was employed in computing the result, time series data were obtained from World Development Indicator (WDI) and OECD National Accounts data files and the study establishes as follows:

1. Official Exchange Rate Volatility (lnEXRVT) had a positive and insignificant relationship with IMPVD in the current year. In the 1st year lag, Official Exchange Rate Volatility had a positive relationship and significant relationship with lnIMPVD but insignificant in the long run.

2. Non-Oil Imports (lnNOIMP) had a positive relationship with the Import Volume Index (lnIMPVD) in in the current and 1st year period and in the long run at 5% level of significance.

3. Trade Openness (TOP_GDP) had a negative and insignificant relationship with lnIMPVD in the current year and significant in the 1ˢᵗ year lag but positively contributed to lnIMPVD in the 2nd year and significant at 5% level of significance and also in the long run.

CONCLUSION

This study used the ARDL model to investigate relative effectiveness of exchange rate volatility on the volume of import in Nigeria for the period 1981-2020. From our findings, non-oil imports and trade openness endogenously contributes to the volume of imports of Nigeria than official exchange rate volatility of Nigeria.

The conclusion to be drawn from this study is Official Exchange Rate Volatility (EXRVT) has an insignificant economic effect on the volume of imports in Nigeria in the presence of other internal and external macro-economic shocks. Nevertheless, to achieve a high and sustainable growth, we proffer some policy recommendations which when properly implemented will surely stimulate greater growth of output.

RECOMMENDATIONS

1. Nigeria should do everything economically possible to strengthen the value of Naira in the FOREX market. This however should exclude pumping billions of dollars into the FOREX market as this only creates a temporary economic condition. Efforts should be made to ensure exchange rate stability in order to stabilize Nigeria's economy. Also, government should put in place measures to reduce the impact of fluctuations in the international trade through the volatile crude oil prices on Nigeria's economic conditions. This can be achieved by reducing the dependence of the economy not only on crude oil exports by diversifying the productive base of the economy through non-oil exports.

2. In this era of globalization, the current Trade liberalization policy should be sustained, but must be fortified with control mechanisms to ensure zero tolerance for corrupt practices (corruption proof). This will eliminate or at least reduce to the barest minimum the rate at which fake, inferior and sub-standard goods, that are of no value in their countries of make, are exchanged for our hard earned foreign exchange. Such policies should incorporate severe sanctions for the economic saboteur.

3. Government should encourage import liberalization through reduction in tariff rates, gradual removal of Non-Tariff Barriers (NTB), outright banning of certain goods which will ensure that our imports, following trade liberalization, is directed mainly on intermediate and capital goods. Imports of consumables would be brought to nil and therefore there would be a corresponding increase in the production of competitive import. Consequently, a higher component of intermediate and capital goods in total import will bring about an improvement in the production of tradable goods, which in turn can provoke increase in exports. This by implication would increase the level of export in the country thereby leading to economic growth in the country.

References

Aghion, P., and P. Howitt. (1992). "A Model of Growth Through Creative Destruction," *Econometrica* 60, 323–351.

Aliyu, S.U.R. (2016). Impact of oil price shock and exchange rate volatility on economic growth in Nigeria: An empirical investigation. *Research Journal of International Studies*, 11, 4–15.

Alugbuo J.C & Nwanguma E.I. (2020). Exchange Rate Volatility and the Relative Effectiveness of Monetary and Fiscal Policies on the Nigerian Economy: An ARDL Model Approach. *The International Journal of Business & Management*. Vol 8. Issue 3

Bah, I. & 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(2), pp.1-20.

Bakare A.S (2011). The Consequences of Foreign Exchange Rate Reforms on the Performances of Private

Campbell Omolara A. (2010), "Foreign Exchange Market and Monetary Management in Nigeria"

CBN, (1995) Central Bank of Nigeria Annual Publication, Abuja.

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

Central Bank of Nigeria. (2019). Statistical bulletin (pp. 45-50). Abuja, Nigeria: Central Bank of Nigeria.

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

Crosby, M. (2000), "Exchange Rate Volatility and Macroeconomic Performance in Hong Kong." Department of Economics, University of Melbourne and Hong Kong Institute of Monetary.

Domac, I. (1977). Are Devaluation Contractionary? Evidence from Turkey. *Journal of Econ. Dev.*, 22(2): 145-63.

Jehan Z, Irshad I (2020) Exchange Rate Misalignment and Economic Growth in Pakistan: The Role of Financial Development. *Pakistan Dev Rev* 59: 81-99. doi: 10.30541/v59i1pp.81-99.

Musa, Nuhu (2021). Impact of Exchange Rate Volatility on Inflation in Nigeria. *Journal of Contemporary Research in Business, Economics and Finance*. ISSN: 2641-0265. Vol. 3, No. 1, pp. 26-38. Publisher: Learning Gate DOI: 10.33094/26410265.2021.31.26.38.

Ndubuaku V, Onwuka K, Onyedika Chukwuka & Chimezie I. (2019). Impact of exchange rate fluctuation on selected economic sectors of the Nigerian economy. *International Journal of Sustainable Development & World Policy*. 2019 Vol. 8, No. 1, pp. 21-36. DOI: 10.18488/journal.26.2019.81.21.36.

Nguse, Tiblets, Betgilu O, Maria F, Anita T, & Goshu D (2021). Does the Exchange Rate and Its Volatility Matter for International Trade in Ethiopia? *Journal of Risk and Financial Management* 14: 591. https://doi.org/10.3390/jrfm14120591

Nuraddeen U, Ibrahim S & Mukhtar T. (2021). Asymmetric effect of exchange rate volatility on trade balance in Nigeria. *National Accounting Review 2021*, Volume 3, Issue 3: 342-359. doi: 10.3934/NAR.2021018.

Ogiogio GO, (1995). Government Expenditure and Economic Growth in Nigeria. *Journal of Economic Management*.

Okolo, C. V., Ugwuanyi, O. S., & Okpala, K. A. (2016). Exchange rate volatility, its determinants, and effects on the manufacturing sector in Nigeria. *International Scholarly and Scientific Research & Innovation*, 10(12), 3940-3948.

Oloyede, J. A. (2002). Principles of international finance. Forthright Educational Publishers: Lagos.

Onyeizugbe, C. U. and Umeagugesi, U. E. (2014). Exchange rate management and the survival of the industrial subsector of Nigeria (1990-2013). *Global Journal of Management and Business Research*, 14(10): 13-18.

Osaka, G., I. Masha and E. Adamgbe, 2003. Issues in exchange rate policy: Economic and political considerations. In O. J. Nnana, S. O. Alade, & F. O. Odoko, Contemporary Economic Policy Issues. Abuja: Central Bank of Nigeria.

Yakub, M. U., Sani, Z., Obiezue, T. O., & Aliyu, V. O. (2019). Empirical investigation of exchange rate volatility and trade flows in Nigeria. *Central Bank of Nigeria Economic and Financial Review*, 57(1), 25-46.