Oil Price and Exchange Rate Volatility in Nigeria (1980-2018)

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Abstract

This study examined the influence of oil price and exchange rate volatility on Economic Growth in Nigeria from 1980 to 2018. Time series data from secondary source ranging from 1980-2018 were employed were employed. The model formulated depicts Real GDP as the dependent variable while Exchange Rate (EXR), Oil Price (POIL), Foreign Direct Investment (FDI) and inflation (INFL) are independent variables. The study employed Johansen Co-integration estimation techniques and VECM to test for the short and long runs effect of the variables used. The ADF test reveals that all the variables are stationary. The results show that POIL and EXR are positively related to GDP. Further findings reveal that there exist two equations at 5% level in both trace and Max – Eigen statistic. This implies that exchange rate volatility and oil revenue contribute positively to GDP in the long run as well. It is therefore recommended that government should adopt certain policy which will help to control the fluctuation and periodic change in oil price. Furthermore, Nigerian government should take serious steps to improve market efficiency and make sure that any variability in oil prices is essential and not negligible.

Keywords: *Oil Price, Volatility, Exchange Rate*
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Introduction

Policymakers, academics and journalists have frequently discussed the link between oil prices and exchange rates in recent years, particularly the idea that an appreciation of the US dollar triggers a dip in oil prices and how they affect economic growth. Empirical research is not so clear on the direction of causation, as there is evidence for bidirectional causality. Some studies find that an increase in the real oil price actually results in a real appreciation of the US dollar, while others show that a nominal appreciation of the US dollar triggers decreases in the oil price (Beckmann& Czudaj 2017).

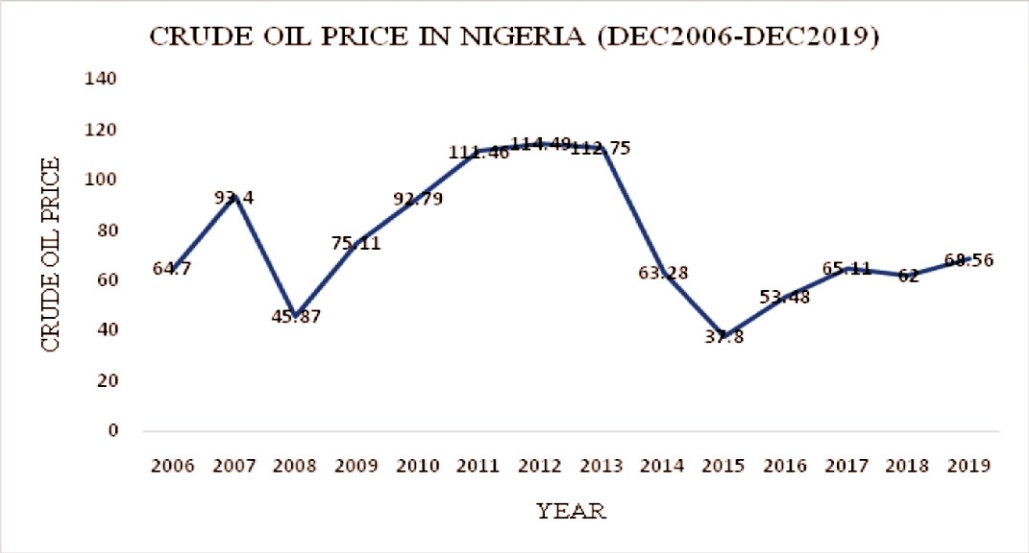
Oil price fluctuations have significant consequences on economic growth. These consequences are expected to be different in oil importing and in oil exporting countries (Al-Ezzee, 2011). In many oil importing countries in Sub-

Saharan Africa (SSA), the prices of petroleum products as well as exchange rate dynamics are key elements driving domestic prices (Kargbo, 2018).

According to Aliyu (2009), an oil price increase, all things being equal, should be considered positive in oil exporting countries and negative in oil importing countries, while the reverse should be expected when the oil price decreases. The challenge, however, of the combined effect of hikes in oil prices and exchange rate instabilities on macroeconomic economic stability and economic growth for oil producing nations like Nigeria is really enormous.

Crude Oil Price (US$/Barrel), Production (mbd) and Export (mbd)			
	Year 2020		
Month	*January*	*February*	*March*
Crude Oil Price (Bonny Light)	66.68	58.45	32.29
Domestic Production	2.07	2.07	2.04
Crude Oil Export	1.62	1.62	1.59

Note: mbd means million barrels per day
Source: Nigerian National Petroleum Corporation (NNPC) and Reuters



Author's Computation, 2020

As evident from the graph above there has been a fluctuation in the crude oil price from 2006 to 2019. The price increase from $64.7 in Dec 2006 to $93.4 in Dec 2007, it later fell to $45.87 in 2008. Since then, it increases till Dec 2013 before declining to $37.8/barrel in Dec 2015. As at Dec 2019, the price of crude oil in Nigeria stood at 68.56US$/Barrel, which show an increase prior to Dec 2018.

It is to be noted that inflation has a significant impact on exchange rate volatility. Due to rise of import prices there is a rise in import prices which leads to increase inflation and currency depreciates (Ravn, Schmitt-Grohé, & Uribe, 2012). So, this problem is faced by both developing countries and developed countries. The various factors affecting exchange rate are inflation, interest rate, exports, imports, foreign debt, industrial growth and foreign direct investment. Exchange rate and oil prices have a significant impact on the growth of the economy.

Since the discovery of oil in commercial quantity, Nigeria has been largely a mono-product economy. From the period of the oil boom of the 1970s till now, Nigeria has neglected her strong agriculture and light manufacturing bases in favor of an unhealthy dependence on crude oil. New oil wealth has led to a concurrent decline of other sectors in the economy and has fueled massive migration to cities and led to increasingly wide spread poverty especially in rural areas (Ogundipe et al. 2014).

As the demand for crude oil has been increasing on a daily basis all over the world, the influence of oil price on exchange rate and exchange rate volatility will become more and more obvious. So, it has become more requisite to study further on the impact of oil price variability on exchange rate fluctuations.

According to Englama et al., (2010), a volatile exchange rate makes international trade and investments more difficult because it increases exchange rate risk. Exchange rate volatility has asymmetric effects on macroeconomic variables. Aliyu (2011) cited that appreciation of exchange rate results in increased imports and reduced export while depreciation would expand export and discourage import. Also, depreciation of exchange rate tends to cause a shift from foreign goods to domestic goods. Hence, it leads to diversion of income from importing countries to countries exporting through a shift in terms of trade, and this tends to have impact on the exporting and importing countries economic growth. Exchange rate depreciation has a negative effect on developing countries (Razaxadehkarsalari, et al, 2011).

The exchange rate is considered as the primary channel through which the fluctuations of oil prices traded in US dollars are transmitted to the real economy and financial markets (Reboredo, 2012). Indeed, an oil price increase will have an effect on a nation's wealth as it leads to a transfer of income from oil importing to oil exporting countries through a shift in the terms of trade (Mirfachihi, 2006). Through a shift in the balance of trade, exchange rates are also expected to change (Brini et al. 2016).

Exchange rate volatility has been defined as the persistent fluctuation of the exchange rate (Alagidede & Ibrahim, 2017). Exchange rate management is important in economic development globally and more particularly in Nigeria, because it has contributed not only to economic instability but also political instability. Under the Structural Adjustment Programmes the main objectives of

exchange rate policy were to preserve the value of the domestic currency, maintain a favourable external balance and the overall goal of macroeconomic stability and to determine a realistic exchange rate for the Naira (Bakare, 2011).

This study contributes to fill the gap in literature regarding oil price variability and exchange rate fluctuations. This paper explores that oil price is also the key variable that determine the real exchange rate of Nigeria.

So, the research objective is to determine the extent to which exchange rate volatility and oil prices significantly relate with economic growth in Nigeria with economic growth in Nigeria.

2. Literature Review: Empirical Evidence

2.1. Exchange rate and Oil Price

Liu et al. (2020)examines the dynamic relationship between crude oil prices and the U.S. exchange rate within the structural break detection context. Based on monthly data from January 1996 to April 2019, the study identifies structural breaks in movements of oil price and examines the dynamic relationship between crude oil prices and the U.S. exchange rate movement by introducing the economic policy uncertainty and using the TVP-VAR (Time-Varying Parameter-Vector Auto Regression) model. Empirical results indicate that shocks to crude oil prices have immediate and short-term impacts on movements in the exchange rate which are emphasized during the confidence intervals of structural breaks. Also, oil price shocks and economic policy uncertainty are interrelated and influence movements in the U.S. exchange rate. Since the U.S. dollar is the main currency of the international oil market and the U.S. has become a major exporter of crude oil, the transmission of price shocks to the U.S. exchange rate becomes complicated. In most cases, the relationship between oil prices and the U.S. exchange rate movements is negative.

Kargbo (2018) investigates exchange rate, petroleum price and price determination in sierra leone The study determines the effects of monetary environment as well as exchange rate movement and petroleum prices on domestic prices in Sierra Leone by estimating a hybrid model of inflation in which inflation responds to its own lags, lags of other variables, and a set of error-correction terms that represent short run disequilibria from the money market, external sector and output that feed into the inflation process. The empirical results from the parsimonious model show that petroleum product prices and exchange rate, as well as monetary factors determine inflation in Sierra Leone.

Beckmann (2017) examined the relationship between oil prices and exchange rates. The empirical research of the study focused on either explaining or forecasting one variable with the other is classified and shows that the evidence varies substantially depending on sample, country choice and empirical method. Yet there is some common pattern such as strong links between exchange rates and

oil prices are frequently observed over the long-run; and either exchange rates or oil prices are a potentially useful predictor of the other variable in the short-run, but the effects are strongly time-varying.

Aloui &Aïssa, (2016) also investigate the exchange rate consequences of oil-price fluctuations across selected MENA countries (including both commodity importers and exporters) and examine the dynamic relationship between such shocks. The study employed the asymmetry of volatility through the GJR-GARCH model using daily time series data covering the period between 2001 and mi-2015. Empirical results reveal that foreign exchange market and crude oil exhibit asymmetric and no asymmetric in the return series. Additionally, the findings show asymmetric response of volatilities to positive and negative shocks. Furthermore, the results suggest that there is a dynamic relationship among oil price shocks and exchange rate volatility. Indeed, in the short run, oil prices shocks had a significant impact on exchange rate changes. Finally, we found that in the case of oil-exporting country, the oil prices rise may experience exchange rate appreciation, while, the decrease of oil price leads to appreciation of the currency of oil importing countries. This implies that oil prices are a key variable in determining the strength of the currency and its volatility.

Shafi et al. (2015) investigates the impact of exchange rate volatility and oil prices fluctuations on economic growth in France based on annual data for fourty years. Impact of oil prices and exchange rate volatility on economic growth has been significant. Cointegration technique is applied to check exchange rate volatility has been significant. Engle and Granger cointegration technique applied and the impact of oil prices and exchange rate volatility on economic growth is checked. Engle Granger results indicate that relationship is significant in the long run and its error correction adjustment mechanism (ECM) in short runs is significant and correctly signed for France.

Ogundipe et al. (2014) examined the effects of oil price, external reserves and interest rate on exchange rate volatility in Nigeria using annual data covering the period 1970 to 2011. The long run relationship among the variables was determined using the Johansen Co-integration technique while the vector correction mechanism was used to examine the speed of adjustment of the variables from the short run dynamics to the long run equilibrium. It was observed that a proportionate change in oil price leads to a more than proportionate change in exchange rate volatility in Nigeria; which implies that exchange rate is susceptible to changes in oil price.

Aliyu (2009) also assessed the impact of oil price shock and real exchange rate volatility on real economic growth in Nigeria on the basis of quarterly data from 1986Q1 to 2007Q4. The empirical analysed the nature of causality among the variables. Furthermore, the Johansen VAR-based cointegration technique is applied to examine the sensitivity of real economic growth to changes in oil prices

and real exchange rate volatility in the long-run while the short run dynamics was checked using a vector error correction model. The results from ADF and PP tests show evidence of unit root in the data and Granger pairwise causality test revealed unidirectional causality from oil prices to real GDP and bidirectional causality from real exchange rate to real GDP and vice versa. Findings further show that oil price shock and appreciation in the level of exchange rate exert positive impact on real economic growth in Nigeria.

2.2. Exchange Rate Volatility and economic growth

Adeniyi & Olasunkanmi (2019) examine the impact of exchange rate volatility on economic growth in Nigeria. The study made use of ARDL co integration and Error Correction Model to capture the stated objective. The results revealed that there is existence of co integration among the variables. The findings also exhibited significant impact of export on Gross Domestic Product while import is insignificant both in the short and the long run. The study established insignificant positive relationship between exchange rate volatility and economic growth in Nigeria.

Ehikioya (2019) examined the impact of exchange rate volatility on economic growth in Nigeria. The study employed the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model and the system Generalized Method of Moments (GMM) technique to analyzed the time series data from the period January 1980 to December 2017. The study used the Augmented Dickey–Fuller and Philips–Perron tests to determine the presence of a unit root and the Johansen co-integration test to establish the relationship among the variables in the study. The results of the estimates offer evidence that exchange rate volatility persists throughout the study period, and has a negative and significant effect on the economic growth of Nigeria. The result suggests that excessive volatility due to low inflows is inimical to the growth of the Nigeria economy. The findings of the study demonstrate a negative and significant relationship between inflation and economic growth. Moreover, while credit to the private sector and crude oil prices exerts positive and significant relationship with growth, the relationship between money supply, trade openness and government expenditure and economic growth is positive but insignificant.

Adjei (2019) estimate the exchange rate volatility and examine the effect of exchange rate volatility on economic growth in Ghana. The investigation covers the period between 1983 and 2010.The variables of concern were five in all which included Exchange rate volatility and Trade Openness, GDP per capita and Physical capital stock and Human capital stock. The ARCH and GARCH Models introduced by Engle (1982) and Bollerslev (1986) were used to model the volatility of the exchange rate using monthly data from January 1983 to December 2010. The results drawn was that exchange rate volatility exerted significant negative effect

on economic growth during the period both in the short and long run. This is because of the high risk in investing hence discouraging international trade and growth.

Ehigiamusoe and Lean (2019)examines the moderating effects of the real exchange rate and its volatility on the finance-growth nexus in the West African region. It also determines the marginal effects of financial development on economic growth at various levels of the real exchange rates and its volatility. The findings show that financial development has a long-term positive impact on economic growth, but this impact is weakened by real exchange rate and its volatility. The marginal effects of financial development on economic growth vary with the levels of the real exchange rate and its volatility. The higher the real exchange rate and its volatility, the less finance spurs growth. We also provide evidence of this scenario in individual specific countries in the region.

Barguellil et al. (2018)investigated the impact of exchange rate volatility on economic growth. An empirical investigation based on a sample of 45 developing and emerging countries over the period of 1985~2015 is conducted using the difference and system generalized method of moments estimators. Findings suggest that the generalized autoregressive conditional heteroskedasticity-based measure of nominal and real exchange rate volatility has a negative impact on economic growth. Also, the effect of exchange rate volatility depends on the exchange rate regimes and financial openness, that is, volatility is more harmful when countries adopt flexible exchange rate regimes and financial openness.

Umaru et al. (2018) examine the effects of exchange rate volatility on economic growth of West African English speaking countries. Macroeconomic data used for this study were obtained from World Bank Data Stream between 1980 until 2017 and analyzed using Stata 14 panel data regression analysis. The results obtained showed that the independent variable (real exchange rate) is statistically significant and negatively related to the dependent variable (GDP) in West African English speaking countries excluding time-invariant variables.

Sabina et al. (2017) investigated exchange rate volatility in Nigeria and its effect on economic growth. The date employed in this study comprised of Exchange Rate, Gross Domestic Product, Government Expenditure, External Reserve, and Foreign Direct Investment which was generated from the Central Bank of Nigeria Statistical Bulletin covering the period of 1981-2015. The study employed GARCH (1,1) model in estimating the volatility of exchange rate in Nigeria and found persistence volatility in naira exchange rate with that of US Dollars. The study also employed the Generalized Method of Moments (GMM) in estimating the impact of volatility and economic growth in Nigeria and the result showed that volatility and FDI has negative and significant impact on the growth of the Nigerian economy. Government Expenditure and External Reserve has positive and significant impact on the growth of the Nigerian economy for the period under study.

Iyeli and Clement (2017)examines the effect of exchange rate volatility on Economic Growth in Nigeria from 1970 to 2011. The model formulated depicts Real GDP as the dependent variable while Exchange Rate (EXR), Balance of Payment (BOP) Oil Revenue (OREV) and inflation (INF) are independent variables. The study employed Johansen Co-integration estimation techniques to test for the short and long runs effect of the variables used. The ADF test reveals that all the variables are stationary. From the parsimonious model, the results show that OREV and EXR are positively related to GDP. Further findings reveal that there exist two equations at 5% level in both trace and Max – Eigen statistic. This implies that exchange rate volatility and oil revenue contributes positively to GDP in the long run.

Ndu-Okereke and Timothy (2017) examined the effect of exchange rate fluctuations on the Nigerian economy. The research was conducted with secondary data from the Central Bank of Nigeria (CBN) statistical bulletin. Secondary data included Gross Domestic Product (GDP) and Demand for Foreign Exchange (DFE). In examining the impact of exchange rate volatility on economic growth macroeconomic the study adopted the ordinary regression model just like Bakare (2011) and Ofurum and Tobira (2011). The study employed the use of vector auto regression (VARs) models on the time series data and the result reveal that supply of foreign exchange has a positive and significant relationship with output level of Gross Domestic Product while the demand for foreign exchange has a negative relationship with gross demand product.

Sani et al. (2016)investigates empirically the effect of exchange rate volatility on the output level of the five English speaking countries in ECOWAS, namely Nigeria, Ghana, Gambia, the Sierra Leones and Liberia, over the period 1991 to 2014. Co-integration test and error correction modelling were used as estimation techniques. Estimates of co-integration relations were obtained and the short-run and long-run dynamic relationships between the variables were obtained for each country utilizing the tests. In general, exchange rate volatility has a significant impact on outputs at least for all the countries considered in the study, with all except Liberia having negative impact.

Ugochukwu (2015) examine the effect of exchange rate volatility on economic growth in Nigeria on the basis of annual data from 1980 to 2012. A review of the literature reveals that exchange rate volatility can have either positive or negative effect on economic growth. Findings show that in the short run, economic growth is negatively responsive to exchange rate volatility in Nigeria case while in the long run, a negative relationship exists between the two variables in the Nigerian economy. The result also indicates that foreign direct investment depresses economic growth in Nigeria. Thus, the huge inflow and stock effect of rising foreign direct investment is not felt while the output effect is evidenced in factory closure and re-location to neighbouring countries.

Basirat et al. (2014)investigate the effect of exchange rate fluctuations on economic growth considering the rate of development of financial markets in developing countries over the period 1986-2010. The effects of variables such as trading volume, inflation, and production of the previous period on economic growth have been studied as well. The results obtained by analyzing panel data of 18 countries show that the effect of financial development on economic growth as well as the effect of exchange rate fluctuation on economic growth are negative and significant. On the other hand, the mutual effect of exchange rate fluctuations and financial development on economic growth is positive, but the effect in the studied countries is so small that is not statistically significant.

Musyoki, et al,(2012) examined the impact of real exchange rate volatility on economic growth in Kenyan. They employed the Generalized Autoregressive Condition of Heteroscedasticity (GARCH) and computation of the unconditional standard deviation of the changes to measure volatility and Generalized Method Moments (GMM) to assess the impact of the real exchange rate volatility on economic growth for the period January 1993 to December 2009. The study found that RER was very volatility for the entire study period. Kenya's RER generally exhibited a appreciating and volatility trend, implying that in general, the country's international competitiveness deteriorated over the study period. The RER Volatility reflected a negative impact on economic growth of Kenya.

2.3. Oil price and economic growth

Akalpler and Bakare (2018) investigated the effects of oil price instability on economic growth between 1981 and 2015. The considered Vector Error Correction model shows that oil price and real effective exchange rate were positively related to economic growth, whereas government expenditure and inflation had a negative relationship. Oil price Granger caused economic growth and exchange rate, while exchange rate Granger caused inflation. The variance decomposition result indicates that oil price instability is the largest source of variation in economic growth and exchange rates, while the largest source of variation in the inflation rate is exchange rate followed by oil price.

Onyeiwu and Oladimeji (2018) also examined the impact of oil prices has on economic growth in Nigeria from 1980 to 2016. An exploratory data analysis is employed using secondary data, employing the unit root test for stationarity, the co-integration to test for longrun relationship between the variables and finally the OLS estimating for the relationship between the key and control variables in concordance with our objectives. The research found that there is a significant and positive relationship between oil price changes and economic growth in Nigeria. In the short-run, Nigeria was able to have increasing growth because of the high global oil prices, but in the long-run, the inconsistency of oil prices and lack of diversification of the productive base has not really helped the Nigeria economy.

Apere and Eniekezimene (2016) examine the crude oil price fluctuation and Nigerian economy (1981–2013), a period of 32 years. Using the VAR Model (VAR) the impact of oil price fluctuation on the economy of Nigeria was examined. In the model, the results shows that changes in oil price has a significant impact on the Nigerian economy (gross domestic product) used in this study. From the regression result, oil prices show positive relationship with GDP. In order to explain the three key variables (crude oil price, exchange rate and gross domestic product) employed in the study, the researcher discovered that a decrease in oil prices have a negative impact on the GDP and also fluctuation in exchange rate has both negative and positive impact on crude oil price and the GDP.

Nwanna and Eyedayi (2016) investigated the impact of crude oil price volatility on economic growth of Nigeria. The study utilizes secondary data from various sources and covers a period of 1980 to 2014. Multiple regressions were used as a tool for data analysis and the findings revealed that there is a positive and significant relationship between oil price and economic growth. Based on the findings the researchers also concluded that oil price volatility does not have a positive impact on the economy (contrary to the findings of some earlier studies) but oil price itself does.

Alley et al. (2014) examine the impact of oil price shocks on the Nigerian economy, using data from 1981 to 2012. The study finds out that oil price shocks insignificantly retards economic growth while oil price itself significantly improves it. The significant positive effect of oil price on economic growth confirms the conventional wisdom that oil price increase is beneficial to oil-exporting country like Nigeria. Shocks however create uncertainty and undermine effective fiscal management of crude oil revenue; hence the negative effect of oil price shocks.

3. Methodology

This paper seeks to identify the impact of exchange rate volatility and oil prices fluctuations on economic growth in Nigeria based on annual data for thirty-nine years (1980-2018). Impact of oil prices and exchange rate volatility on economic growth has been significant. Unit root test, Johansen cointegration technique and vector error correction model would be used to check the impact of oil prices and exchange rate volatility on economic growth.

Annual time series data of the variable is taken from World Development Index (WDI) and Organization of Petroleum Exporting Countries (OPEC) data base statistical bulletin from year 1980 to 2018 for Nigeria. Gross domestic product is taken in US $. Data of exchange rate variability is taken per US $ based real effective official exchange rate (EXR), Foreign direct investment (FDI) at current US $ and Inflation rate (INFL) from the same source. Data of world oil prices is taken in current US $.

In order to estimate the relationship between economic growth, exchange rate volatility and, oil price, the following models are adopted.

$GDP = \alpha + \beta 1POIL + \beta 2REXR + \beta 3INFL + \beta 4FDI + \mu$..... (1)

Where GDP = Gross Domestic Product (proxy for economic growth)
POIL = Oil Price
EXR = Exchange Rate
INFL = Inflation Rate
FDI = Foreign Direct Investment

4. Data Analysis

4.1. Unit Root Test

In the literature, most time series variables are non-stationary and using non-stationary variables in the model might lead to spurious regressions. The first or second differenced terms of most variables will usually be stationary (Rmanathan 1992). The result of the unit root test based on the AugumentedDickey-Fuller (ADF) methods is presented in table 4.1 below

Table 4.1: Time Series Unit Root Test Results

Variables	*ADF Statistical with Intercept*	*Probability*	*Order of Integration*
GDP	-4.724804	0.0005	I(1)
POIL	-5.229614	0.0001	I(1)
EXRT	-4.253015	0.0019	I(1)
FDI	-7.611283	0.0000	I(1)
INFL	-5.762374	0.0000	I(0)

Source: Author's Computation, 2020.

The unit root test is carried out with constant and trend specifications for the respective series. The lag-selection was based on the default selection of the Akaike-Information Criterion (AIC). The table contains the ADF test statistic at first difference of the panel series. The numbers in the brackets represent the probability values of the estimate test statistic of the ADF test.

The unit root test result from the ADF methods shows that the order of integrations of the variables is being stationary at first difference at the same time, except INFL that is stationary at level. In particular the stationarity of the general unit root process for the set of time series data for the variables shows that they are all significant at least at the 5 percent level for the first difference of all the variables and thus the null hypothesis of unit root in the data cannot be upheld.

4.2. Johansen Co-integration Test

Table 4.2. Johansen Co-integration Test

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.837418	136.8663	69.81889	0.0000
At most 1 *	0.632367	69.65297	47.85613	0.0001
At most 2 *	0.431028	32.62816	29.79707	0.0230
At most 3	0.214117	11.76297	15.49471	0.1686
At most 4	0.074083	2.847908	3.841466	0.0915

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level
** denotes rejection of the hypothesis at the 0.05 level*
Source: Author's Computation, 2020.

As evident in table 4.2, the co-integration tests include the GDP proxy for economic growth, and other variables. The test statistics strongly reject the null hypothesis of co-integration in favor of three co-integration relationships.

The trace test rejected the null hypothesis (Ho) that there is no co-integrating relationship between the variables and the test based on the maximum Eigen value also rejected the null hypothesis. They both indicate evidence supporting two co-integrating equation at the 5 percent level of significance. The result of the co-integration test showed that GDP, POIL, EXR, INFL, FDI have equilibrium condition which keeps them in proportion to each other in the long run.

4.3. Vector Error Correction Model (VECM)

The ECM coefficient is known as the speed of adjustment factor, it tells how fast the system adjusts to restore equilibrium. It captures the reconciliation of the variables over time from the position of disequilibrium to the period of equilibrium (Ogundipe et al. 2014).

Table 4.3: Vector Error Correction Model (VECM)

Variable	*ECM (-2)*	*T-statistic*
D(GDP)	-1.591707	-1.43062
D(POIL)	-0.720989	-2.58877
D(EXR)	-0.019288	-0.09612
D(INFL)	-0.116506	-0.56940
D(FDI)	-1.908631	-0.10556

Source: *Author's Computation, 2020.*

The speed of adjustment co-efficient for GDP is -1.591707. The VECM is correctly signed and in terms of magnitude it lies between 0 and 1. Satisfying these criteria signifies that the model has the capacity to correct errors generated in the immediate periods at it approaches its long run equilibrium path. Precisely the error correction model in this equation means that about 159.17 percent of errors generated between each period are correlated in subsequent periods. Since errors are short lived in our model, it implies that the long run relationship obtained is sustainable and our result is reliable.

5. Conclusion and Recommendation

This research study seeks to ascertain whether oil price and exchange rate volatility has a significant influence on economic growth in Nigeria over the periods of 1980 -2018 using the Johansen and vector error correction approach. It also considered other factors that can affect exchange rate in Nigeria like foreign direct investment and inflation rate. In the model economic growth (GDP) was the dependent variable and the independent variables were oil price, exchange rate, foreign direct investment and inflation rate. After the review of relevant literature and the necessary empirical analyses it was observed that a proportionate change in oil price and exchange rate volatility will lead to a more than proportionate change in economic growth of Nigeria. Our result on influence of exchange rate volatility and oil price on economic growth is similar to that of Ogundipe et al. (2014) and Shafi et al. (2015) but contradict Nwanna and Eyedayi (2016) result on impact of oil fluctuation on Nigeria economic growth.

Some policy recommendations are drawn on the basis of results. Since fluctuation in oil price is one of the major factors affecting exchange rate volatility in oil exporting countries like Nigeria, government should adopt certain policy which will help to control the fluctuation and periodic change in oil price. Government should take serious steps to improve market efficiency and make sure that any variability in oil prices is essential and not negligible.

Furthermore, the policy makers should pursue policies that will ensure stability in the exchange rate. Attention of government should be shifted from mono cultural economy to other sector so that oil price will not be the major determinant of exchange rate volatility in Nigeria. Finally, oil price and exchange rate system should be well monitored so as to experience perfect economic growth.

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