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OIL PRICE FLUCTUATION AND EXCHANGE RATE IN NIGERIA: IS THERE A VOLATILITY TRANSMISSION EFFECT

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ABSTRACT

Purpose: *Over the period 1980-2022, we examined the transmission effect of oil prices on Nigeria's exchange rate. E-GARCH (Exponential GARCH) model is employed in this study.*

Approach/Methodology/Design: *We used Augmented Dickey Fuller to determine a unit root, integrating exchange rates, crude oil prices, external reserves, GDP, inflation, and interest rates to one I(1) and zero I(0). We used Johansen Co-integration to determine long-term relationships. Interest rates, inflation, and crude oil prices all correlated positively with each other.*

Findings: *A statistically insignificant result is shown by the variance equation, indicating there is no correlation between crude oil prices and exchange rates. The Nigerian exchange rate is not affected by volatility transmission or leverage due to fluctuations in crude oil prices.*

Originality/value*: According to the study, governments should take monetary policy measures to stabilize exchange rates during unpredictable oil price fluctuations. It is necessary to adjust the naira exchange rate when oil prices fluctuate.*

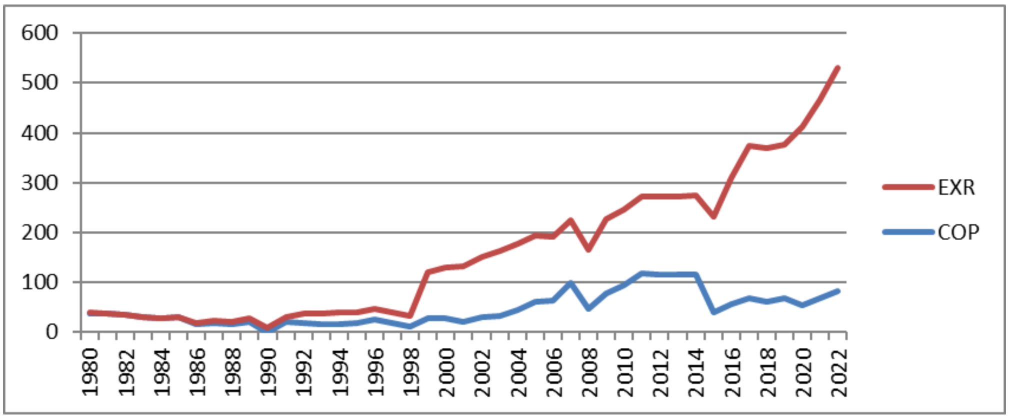
INTRODUCTION

Agricultural production was Nigeria's major source of income before commercial quantities of oil were discovered. It was a time of stability in our relative prices, a time of low inflation, a time of low unemployment, a time of favorable balance of payments, and a time when Naira to US dollar exchange rates were stable. However, once oil was discovered, they were revealed to be nothing but a mirage, and their condition further deteriorated. Thus, Nigeria's economy can be affected both by changes in oil prices and by macroeconomic shocks in the global economy (Salameh, 2015). The oil crisis or shock began with the announcement of an oil embargo by the Organization of Arab Petroleum Exporting Countries and Saudi Arabia in October 1973. The nation of Israel was supported by a number of nations during Yom Kippur. The embargo had both short-term and long-term effects on politics and economies throughout the world. GDP has declined by 4.7% in the United States and 2.5% in the European Union. As a result of the second shock in 1979, the global GDP dropped by 3% (Salameh, 2015).

Due to the volatility of the international oil market, there has been widespread concern that Nigeria's economy has become overly dependent on oil prices. As Nigeria's economy is heavily dependent on crude oil, the fluctuation in oil prices adversely affects the country. The volatility of oil prices can be attributed to a number of factors, including macroeconomic instability and uncertainty. Based on the research of Aigheyisi (2018), macroeconomic volatility adversely impacts both investing and growth. Nigeria's economy is negatively impacted by these changes in crude oil prices in virtually all sectors.

Oil prices have fluctuated greatly since the 1970s. Philip & Akintoye (2006) reported that, in 2002, the price of oil fluctuated between $17 and $26 a barrel, rose to $53 in 2004 and reached $60 in 2005, according to Okoli, Tewari, & Oluwafisayomi (2017). There was a 70-per-barrel oil price in 2007; however, there was a $145-per-barrel price in 2008. As of August 2010, the price of crude oil averaged $75 per barrel, down from $61.73 per barrel in 2009. A study conducted by this author found that oil prices have fluctuated since 2010, reaching $95% in December 2010 and $117.1 by the end of 2011. There was a decline in 2012 to $114.49 and a rise in 2013 to $112.29. From 2014 to 2015, oil prices declined dramatically to $63 and $37.8 per barrel. It should also be noted that in 2016, 2017, and 2018, the oil price was $53.48, $65.11, and $62 per barrel, respectively. Crude oil prices were $68.56 per barrel at the end of 2019 and $42.7 per barrel at the end of 2020. At the end of 2021, crude oil prices had reached $76.25 per barrel (CBN, 2021). In March and July 2021, crude oil prices had reached $62.48 and $67.37 per barrel, respectively. Crude oil prices in 2022 began at $80.07 per barrel and fluctuated during the period, ultimately ending at $86.3 per barrel. According to the CBN (2023), the price per barrel was $74.75 at the end of May 2023.

FIG 1: Movement of Crude Oil Price Fluctuation (US$) and Exchange Rate in Nigeria (1980 -2022).



Source: Author's presentation base on data from CBN Bulletin 2022

The crude oil price is one factor that influences Nigeria's exchange rate as shown in the following diagram. There is a tendency for the exchange rate to rise when crude oil prices rise, and for the exchange rate to fall when crude oil prices fall. As a price variable within an economy, the exchange rate serves as an anchor for the price. It also contributes to the competitiveness of the nation. A relatively stable exchange rate is essential to an economy's growth (Mordi, 2006). Oil is a major source of foreign exchange for Nigeria. It is impossible to overstate the significance of this factor in determining the value of the Nigerian Naira.

In order for oil prices to be reflected in real exchange rates, both a supply channel and a demand channel are involved. As crude oil is an integral component of the production process, an increase in the price of crude oil will increase the production costs of non-tradable goods. This will result in an increase in the price of non-tradeable goods, which will result in an appreciation in the real exchange rate. The exchange rate is also indirectly affected by the relationship between disposable income and the exchange rate. Consumers' purchasing power decreases as oil prices rise. Consequently, non-tradeables will experience a decline in demand, resulting in a decline in price. Real exchange rates will depreciate as a result (Oriavwote & Eriemo, 2012).

In the event of an increase in crude oil prices, oil exporting nations' exchange rates are likely to appreciate as a result of an increase in their foreign exchange earnings and foreign exchange reserves. A depreciation of the exchange rate is likely to occur in oil-importing nations, according to Büetzer, Habib, & Stracca (2012). Foreign reserves increase as oil prices rise, resulting in a favorable trade balance and an appreciation of the exchange rate. It is, however, important to note that low crude oil prices, resulting from international events, may cause the exchange rate to depreciate and the foreign exchange reserves to deplete, resulting in a deficit in the budget, reduced foreign exchange flows, and slower growth of the economy (Olayungbo, 2019).).

The discovery of oil in Nigeria has also not been associated with economic development. It has been observed that Nigeria faces multiple economic contradictions as a result of its mono-cultural oil base, as stated by Soremekun & Obi (1993). Certain nationalities have been stymied by other nationalities due to a number of contradictions within the country. They are seeking an escape route. Moreover, according to Aiyegoro (1997), the discovery of oil in Nigeria led to the over-bloating of public sectors, the advancement of ambitious public projects, the depreciation of the currency, the lack of effective price controls, and a number of flawed public policies. A long-standing problem in Nigeria was aggravated by the Corona virus pandemic. At the beginning of the pandemic, Nigeria's oil revenues declined by 65% due to the global slump in oil prices.

As crude oil prices have declined, government revenues have decreased, and the threat of default on financial obligations has increased, which has adversely affected Nigeria's foreign exchange earnings and foreign reserves. According to expectations, crude oil prices are expected to fall from US$ 65.11 per barrel in 2017 to US$ 62 per barrel in 2019, rise to US$ 68.56 in 2019, and then decline to US$ 50.33 per barrel in 2022. As reported by Musa, Maijama'a, Shaibu, & Muhammad (2019), oil prices have fluctuated due to concerns regarding looming imbalances in supply and demand. Oil exporting countries, such as Nigeria, may experience a loss of profits or even revenue if oil prices decline.

Exchange rates and oil prices have a significant impact on inflation, economic growth, international trade, and energy management. Research has been conducted on the relationship between the two, primarily to establish causality guidelines and guidelines for interaction. Studies like Oluwatomisin, Ojeaga, Adeyemi, & Ogundipe (2014), Volkov & Yuhn (2016), Hussain, Zebende, Bashir, & Donghong (2015), Pershin, Molero, & Perez De Gracia (2016), and Igbinovia, & Ogiemudia (2021) saw an asymmetric effect between oil price and exchange rate while studies like Abubakar (2019), Abed, Amor, Nouira, & Rault (2016), Atems, Kapper, and Lam (2015), Ahmad & Hernandez (2013) and Tiwari & Albulescu (2016) saw no asymmetric effect between oil prices and exchange rate. Consequently, this study aims to identify the volatility transmission effect of fluctuations in oil prices on the Nigerian exchange rate, as well as suggest ways of reducing their adverse effects.

Objective of the study

To investigate the volatility transmission effect between oil price fluctuations and exchange rate in Nigeria.

REVIEW OF LITERATURE

Theoretical Literature

Richard Auty (1993) proposes that the resource curse theory or the Dutch disease theory explains why oil's large cash entry tends to result in excessive spending. High oil revenues and rising exchange rates lead to an unfavorable balance of payments. Agricultural and manufacturing activities were displaced by the oil industry, which discourages the taking of risk in non-oil industries. A paradox of plenty has been described by Adam (1991) as the resource curse. The minerals and fuels in countries with abundant natural resources are considered nonrenewable point-source resources with poor developmental outcomes and low economic growth. Corden & Neary (1982) and Corden (1984) demonstrate that real exchange rate appreciation is precipitated by increases in commodity prices or production, which in turn results in a decline in manufacturing. This effect can be attributed primarily to spending and resource movement. As a result of the capital and labor movement from the manufacturing sector to the oil or service sector, the real exchange rate appreciation negatively impacts the manufacturing sector. The increase in oil prices has a positive effect on wages and profits, as well as on aggregate demand. The peak oil theory was first proposed by an American geoscientist named Marion King Hubbert in 1956. According to him, peak oil occurs at the point when crude oil extraction reaches its maximum, i.e. when it is anticipated that extraction rates will start to decrease. The study of peak oil was initiated by Hubbert in the 1950s after he reported on the evolution of oil and gas production rates. It was reported in his paper that the oil production in a particular region was approximated by a bell curve, with an exponential increase in production in the early stages before beginning to decline, reaching a peak when approximately half of the oil is extracted, and then declining at the terminal. As a result of using this methodology, he estimated 150 billion barrels per day (bpd) as the likelihood of the ultimate reserve for the lower states and offshore areas. According to his estimates, US oil production would peak in 1965 with 6.6 million barrels per day (bpd) in 1955. His projections for the year around indicated a maximum production rate of 34 million barrels per day.

Flexibility of prices has been used in the development of several monetary models, such as Dornbusch's sticky-price model (1976) and Frenkel's flexible price model (1996). A balance between money supply and demand in each country determines exchange rates, according to this theory. As a result of a monetary approach, nominal money demand and nominal national income have a positive relationship in the long run, but interest rates have a negative relationship. Using the multiplier of the monetary base of a nation, one can calculate the monetary supply of that nation. As well as its domestic credit, international reserves constitute the monetary base of a nation. Unless there is a deficit of payments in a nation, a currency will not depreciate if there is too much money in the domestic market.

Empirical Literature

An asymmetric effect of oil price shock on EUR/USD has been studied by Karel & Quang (2022) based on quarter-by-quarter data from 2001 to 2021. According to the study, a positive change in oil prices leads to a depreciation of the dollar, but the opposite is not true, a decline in oil prices leads to an appreciation of the dollar. In addition, Zhang, Zhang, Gao, Li & Yang (2022) looked at the effects of three types of oil shocks on exchange rates: oil supply shocks, oil demand shocks, and oil risk shocks. The largest impacts of oil price shocks on the exchange rate were on oil demand, according to this study. A certain periodicity can be observed in short-term time variations of the oil price and exchange rate market. In Saudi Arabia, Suliman & Abid (2020) found that the price of oil is closely related to the real exchange rate based on monthly data from

January 1986 to March 2019. The long-run equilibrium relationship between variables was determined using the Autoregressive distributed lag model and error correction model. A strong cointegration can be observed over the long run in the study, and the same relationship can also be observed in the ARDL. It should also be noted that short-term results suggest that oil price and exchange rate have a unidirectional causal relationship. It was examined in a study by Qiang, Lin, Zhao, Liu, and Liu (2019) how fluctuations in international oil prices affect the exchange rates of oil-importing countries. Changes in the exchange rate of the US dollar will have an impact on international crude oil prices. The level of impact of national crude oil fluctuations on the exchange rates of oil-importing countries varies depending on the degree of dependence of each country on crude oil prices. Several researchers have examined the impact of national crude oil fluctuations on the exchange rates of oil-importing countries.

Based on monthly data from January 1986 to June 2018, Abubakar (2019) examined the dynamics of the relationship between oil prices and exchange rates in Nigeria. Using threshold autoregressives, momentum threshold autoregressives, and structural vector autoregressives, the study investigates asymmetries in relationships and exchange rate effects. There is no asymmetries in the relationship between oil price and exchange rate in Nigeria as shown by TAR and MTAR. A study conducted by Musa, Maijama'a, Shaibu, & Muhammad (2019) found that oil prices and exchange rates influenced Nigeria's economic growth between 1982 and 2018. As part of the study, we used the Autoregressive Distributed Lag Model. It has been found that the price of crude oil and the exchange rate are both positively correlated with economic growth. A study conducted by Olayungbo (2019) examined the granger causal effects of oil prices on Nigeria's foreign reserves, trade balances, and exchange rates between 1986Q4 and 2018Q4. The granger effect of oil prices affected foreign reserves in the short term, but it was not associated with exchange rates or trade balances. A study conducted by Babatunde (2015) of Nigerian oil price shocks and exchange rates from January 1997 to December 2012 resulted in an analysis of data from January 1997 to December 2012. For this study, a variety of regression methods were used, including Co-integration, Fully Modified Least Squares (FMOLS), Dynamic Least Squares (DOLS), and Canonical Co-integration Regression (CCR). Crude oil price increases adversely affected Nigerian petroleum imports, according to the study. A positive shock to oil prices will not affect the depreciation of the naira.

In Nigeria, Omolade, Nwosa, & Ngalawa (2019) investigated whether oil price shocks are transmitted through monetary channels. In the study, crude oil prices are associated with long-term appreciation of exchange rates. Asymmetrical responses to oil price shocks are found in Saudi Arabia's money demand according to Alsamara, Mrabet, Dombrecht, and Barkat (2016). A linear autoregressive approach was replaced with an ARDL approach in the study. It appears that oil price shocks and money demand are positively related over the long run, but the effects are asymmetric. Oil price shocks that increase positively have a greater impact than those that decrease positively. It is possible to say the same of Ebrahim, Inderwidi, & Kind (2014), who studied the macroeconomic effects of oil price volatility between 1980 and 2012. The volatility of oil prices constitutes a fundamental obstacle to economic growth due to its damaging and destabilizing effects on the macroeconomy. The volatility of oil prices has a negative effect on aggregate consumption, inflation, unemployment, investment, and industrial production in non-OECD countries.

An examination of crude oil price movements on the Nigerian stock market in Abraham (2016) looked at the exchange rate as a potential countercyclical policy tool. In order to analyze the Nigerian stock market, Autoregressive Distributive Lag (ARDL) was used to analyze daily data between 2008-2009 and 2012-2015. Devaluation of the Nigerian naira reduces the exchange rate's impact on crude oil declines, resulting in a positive relationship between oil prices and stock market performance. Based on a similar study, Asekunowo (2016) found that exchange rates have a greater impact on consumer prices than crude oil prices. ABS et al. (2016) studied the modeling of macroeconomic and oil price volatility in Nigeria based on daily exchange and price data (10/12/2001-6/2/2010) and monthly macroeconomic data. An application of the GARCH model along with its variants (GARCH-M, EGARCH, and TGARCH) was conducted in this study. Exchange rate and oil price are two macroeconomic variables that are highly volatile. Interest rate volatility and real GDP volatility are both internal shocks that have a negative impact on the country, as well as external shocks that have a negative impact on the country.

Contribution to Knowledge

In light of empirical data, the researcher reviewed a large amount of literature and found that other studies have explored the relationship between oil price and exchange rate in Nigeria and other countries. With the aid of recent Nigerian data, this study will examine the transmission effect between changes in oil prices and changes in exchange rates, as well as the long-term relationship between them. Our understanding of policy can be enhanced by considering the transmission effect. We will be able to gain a better understanding of oil price appreciation and depreciation in Nigeria currency by using a monthly data set from 1980 to 2022 for the Exponential GARCH Model.

METHODOLOGY AND PROCEDURES

In this theory, oil prices and economic activity are explained in terms of linear/symmetric relationship theory. There is considerable evidence that oil price volatility is responsible for fluctuations in the gross national product (GNP) as suggested by Hamilton (1983), Godwin (1985), Hooker (1986), Gisser (1985), and Laser (1987). Bollerslev's (1986) work led to the development of GARCH models in a variety of variations. A model is useful for detecting clusters in a trend in order to forecast values of the series with a minimum amount of error. Both the VAR and the GARCH models cannot explain how an independent variable impacts a dependent variable in a dynamic manner. As a consequence of this approach, GARCH models with fewer terms are more effective than ARCH models with many conditions. It should be noted, however, that neither ARCH nor GARCH models are able to capture this asymmetry. In 1991, Nelson developed the exponential GARCH (EGARCH) model of volatility, which demonstrated asymmetry in real growth direction. As a result, the GARCH-M (GARCH-p,q) model is characterized by the following characteristics:

$$Y_t = a + \beta' X_t + \theta h_t + \mu_t. \qquad 3.1$$

$$\mu_t / \Omega_t \approx iidN(0, h_t)$$

$$h_t = \gamma 0 + \sum_{i=1}^{p} \delta j h_{t-1} + \sum_{j=1}^{q} \gamma j u^2{}_{t-1}. \qquad 3.2$$

EGARCH (p, q) model is given by.

$$Log(\delta_{t2}) = \alpha + \beta In(\delta_{t-1}) + \frac{\gamma \mu_{t-1}}{\sqrt{\delta 2_{t-1}}} + \alpha \left[\frac{\mu_{t-1}}{\sqrt{\delta 2_{t-1}}} - \sqrt{\frac{2}{\pi}} \right]. \qquad 3.3$$

Where σt2 = Conditional variance

σ_{t-1} = 1st lag of the coefficients

Model Specification

To investigate the volatility transmission effect between oil price fluctuations and exchange rate in Nigeria.

$EXR_t = f$(COP, GDP INF INT ER) 3.4

Where EXR = Exchange rate

COP = Crude oil price

GDP = Gross domestic product

INF = Inflation

INT = Interest rate

ER =External Reserve

Equation (3.4) is transformed into an autoregressive conditional Heteroskedastic Model with the conditional mean equation as:

$EXR_t = \beta_1 + \beta_2 COP + \beta_3 GDP + \beta_4 INF + \beta_5 INT + \beta_6 ER + \mu_t \ldots \mu_t \sim iiN(0, \sigma t2)$ 3.5

Where β_1, β_2, β_3, β_4, β_{5and} β_6 represents the intercept and slope parameters of

the conditional variance under the ARCH(q) and the GARCH (1,1) is the simplest form of the GARCH (p q) model for which the variance equation has the form

$$ht = \alpha_0 + \delta_1 h_{t-1} + \gamma_2 \mu_{t-1.}^2 \tag{3.6}$$

$$ht = \alpha_0 + \delta(\alpha 0 + \delta h_{t-2} + \alpha_1 \mu_{t-2}^2) + \alpha_2 \mu_{t-2}^2 \tag{3.7}$$

$$ht = \frac{\alpha_0}{1-\delta} + \gamma 1 \sum_{j=1}^{\infty} \delta^{j-1} \mu_{t-j}^2 \tag{3.8}$$

There is an analogy between the GARCH(11) specification and the ARCH model with an infinite order and geometrically declining coefficients. A number of challenges arise when modeling volatility, particularly due to the non-negativity constraint imposed on equation (3.3), which may be violated, as well as the large number of lags that are associated with it. As a result, Nelson (1991) proposed an exponential GARCH model (EGARH) that overcomes these difficulties.

Pre-Estimation Test

Unit Root Test

In addition to crude oil price, exchange rate, and exchange rate fluctuations, the Augmented Dickey Fuller (ADF) root test was conducted on all other variables. Nigeria's exchange rate volatility is being evaluated during this study period in order to determine whether the series is stable and how crude oil price fluctuations have affected the series. According to Dickey Fuller (1979), the accompanying regression condition is a method for testing whether the unit root is near or far.

$$\Delta y_{t-1} = \alpha_0 + \gamma y_{t-1} + \mu_t \tag{3.5}$$

By including extra lagged terms of the dependent variable, Dicky and Fuller proposed an augmented version of the test to eliminate autocorrelation. Here is how the ADF can be expressed using the equation below.

$$\Delta y_t = a_0 + \lambda y_{t-1} + a_{2t} + \sum_{i=1}^{p} \beta_i \Delta y_{t-1} + \mu_t \tag{3.6}$$

Estimation Techniques

The Exponential GARCH (EGARCH) model

The exponential GARCH or EGARCH model was first used by Nelson (1991) and the variance equation for this model is given by:

$$\log(ht) = \alpha + \sum_{j=1}^{m} \beta j \left| u_{t-j} \Big/ \sqrt{h_{t-j}} \right| + \sum_{j=1}^{n} \theta j \frac{u_{t-j}}{\sqrt{h_{t-j}}} + \sum_{i=1}^{n} \delta_i \log(h_{t-i})$$

3.7

Where $\alpha, the\ \beta s, \theta s\ and\ \delta s$ are parameters to be estimated. From the equation above, the left hand side is the variance series. This make the leverage effect exponential instead of quadratic, and therefore the estimates of the conditional variance are guaranteed to be non-negative. The EGARCH model allows for the testing of asymmetries. To test for asymmetries the parameters of importance are ξs. If $\xi 1 = \xi 2 = \cdots = 0$ then the model is symmetric. When $\xi j < 0$, then positive shocks (good news) generate less volatility then negative shocks(bad news).

RESULTS AND DISCUSSION

Unit Root Analysis (Table 4.1)

Table 4.1 below present the results of ADF test statistics for the levels and first difference of the stochastic time series data for the period, 1980m1 to 2021m12. The asterisk (*) denotes rejection of the unit root hypothesis at the 5%.

Variables	ADF (Intercept and trend)				
	Test Critical value@ 5%	Level	1^{st} Diff	Diff Prob	Order of Integration
EXR	-3.419000	-0.742691	-4.653174*	0.0009	I(1)
COP	-3.418798	-2.660203	-22.34287*	0.0000	I(1)
ER	-3.419000	-3.015837	-4.359683*	0.0027	I(1)
GDP	-3.419000	-1.854764	-6.706416*	0.0000	I(1)
INF	-3.418798	-3.067036	-22.34029*	0.0000	I(1)
INT	-3.419000	-4.200848*		0.0048	I(0)

The results of the unit root tests in the levels of exchange rate, crude oil price, external reserves, gross domestic product, and inflation clearly suggest the presence of a unit root. After first differencing the series, there is a robust rejection of the null hypothesis of a unit root, indicating that the series are integrated of order one I(1). While the results indicate that there is no presence of a unit root at the level of interest rates, this rejects the null hypothesis. In light of this, it can be concluded that the series are integrated of order zero I(0).

Johansen Co-integration Test

Table 4.2: Unrestricted Co-integration Rank Test (Trace)

Hypothesis No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical value	Prob**

*r0**	0.090024	112.3765	95.75366	0.0022
r1	0.069205	67.56619	69.81889	0.0746
r2	0.027449	33.50118	47.85613	0.5292
r3	0.021248	20.28055	29.79707	0.4040
r4	0.010760	10.07916	15.49471	0.2747
*r5**	0.010347	4.940412	3.841466	0.0262

* denotes rejection of the hypothesis at the 0.05 level

In the trace test, one (1) co-integration equation is found at a 5% level. Based on the results presented above, it appears that the trace statistic values are less than 5% of the critical value. The maximum eigenvalue statistic is presented as a further confirmation of this result. Normally, this approach tests the null hypothesis of *r* versus *r*+1 co-integrating relationships. Max-eigenvalue test statistics which exceed the respective critical value are considered to reject the null hypothesis. The results of this test are presented in column 2 of table 4.2. Unrestricted Co-integration Rank Test (Maximum Eigenvalue).

Hypothesized No. of CE(s)	Eigenvalue	Max-Engen Statistic	0.05 Critical Value	Prob **
*r0**	0.090024	44.81030	40.07757	0.0136
*r1**	0.069205	34.06501	33.87687	0.0475
r2	0.027449	13.22063	27.58434	0.8724
r3	0.021248	10.20139	21.13162	0.7255
r4	0.010760	5.138747	14.26460	0.7242
*r5**	0.010347	4.940412	3.841466	0.0262

* denotes rejection of the hypothesis at the 0.05 level

At the 5% significance level, the Max-Eigenvalue test also indicates that there are two co-integrating equations. Based on the normalized co-integrating coefficients, it was further determined that the two co-integrating variables are the exchange rate, crude oil price, and interest rate t. This indicates that the variables are likely to be related over the long run.

Egarch Model

Table 4.3

Dependent Variable: EXR

LOG(GARCH) = C(7) + C(8)*ABS(RESID(-1)/@SQRT(GARCH(-1))) + C(9)

*RESID(-1)/@SQRT(GARCH(-1)) + C(10)*LOG(GARCH(-1))

Variable	Coefficient	Std. Error	z-Statistic	Prob
C	99.47291	0.020059	4959.114	0.0000
D(COP)	0.268536	0.065462	4.102163	0.0000
D(GDP)	0.002866	0.000386	7.427234	0.0000
D(ER)	0.000618	0.000175	3.537703	0.0004
D(INF)	1.596773	0.017049	93.65584	0.0000
INT	2.466786	0.001862	1234.969	0.0000
Variance Equation				

C(7)	-1.095639	0.151439	-7.234839	0.0000
C(8)	2.864733	0.219529	13.04947	0.0000
C(9)	0.152004	0.134388	1.131088	0.2580
C(10)	0.808242	0.034841	23.19790	0.0000

In Table 4.3 above, there are two columns, one containing the mean equation and the other containing the variance equation. In order to estimate the variance equation, a residual has been derived from the mean equation. It is important to note that LOG(GARCH) represents the conditional variance as well as the dependent variable which is volatility of return. As can be seen from the mean equation, crude oil price, gross domestic product, external reserves, inflation, and interest rate are statistically significant and positively correlated with exchange rate. Since the coefficient of C9 or *RESID(-1)/@SQRT(GARCH(-1)) is statistically insignificant, it suggests there is no correction effect between crude oil price fluctuation and exchange rate volatility. Thus, there is no volatility transmission or leverage effect between crude oil price fluctuations and the Nigerian exchange rate. Taking the above result into account, we reject the alternative hypotheses and accept the null hypothesis. The results of this study are consistent with those of Olomola and Adejumo (2016) and Apere and Ijomah (2013).

CONCLUSION AND SUGGESTION

Through the use of EGARCH models, this study examines the volatility transmission effect between oil price fluctuations and exchange rate fluctuations in Nigeria in both the short and long run. The study revealed a number of interesting findings. In this study, the EGARCH model is used to estimate the impact of crude oil prices on Nigerian exchange rates. According to the coefficient of variance equation, there is no leverage effect on exchange rates due to fluctuations in crude oil prices. Due to the absence of any shocks or volatility transmission effects (increases or decreases) on the Nigerian exchange rate as a result of crude oil price shocks, the null hypothesis is accepted, and the alternative hypothesis is rejected. Based on the findings of the study, the following recommendations are made: Due to the fact that oil prices are determined exogenously, Nigeria's overreliance on oil as a major source of foreign exchange earnings must be reduced in order to mitigate these effects. This can be accomplished by diversifying the government's export base. The federal government should seek to attract foreign exchange to the country by encouraging foreign direct investment and foreign portfolio investments. In light of the recent increase in crude oil prices, Nigeria should take advantage of its external reserves to reduce exchange rate volatility. Since exchange rates are subject to changes in economic conditions, an increase in oil prices could be used to invest in other sectors of the economy. Monetary policy measures are required by governments to stabilize exchange rates when oil prices change unexpectedly. In conclusion, when oil prices fluctuate, the main consideration should be an adjustment in the exchange rate of the naira. Accordingly, the alternative hypothesis should be rejected.

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