Foreign Direct Investment

Key Factor for the Economic Development of Emerging Countries

Foreign Direct Investment Inflows and Oil Price Fluctuations in Developing Oil Exporting Countries: the Case of Nigeria

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Abstract: The study investigates the impact of oil price fluctuations on foreign direct investment inflows in developing oil exporting countries using Nigeria as a case study by ARDL method and VECM granger causality test to analyse the data spanning from 1970 to 2015. It was observed that oil price fluctuations do not favour foreign direct investment in Nigeria both in the long-run and short-run. This implies that as oil price changes foreign direct investment inflows falls. VECM granger causality test revealed that there is no direction of causality between oil price fluctuations and foreign direct investment inflows in Nigeria. We therefore concluded that oil price is not an important determinant of foreign direct investment inflows. The study recommends that government should take the advantage of times of positive change in the oil price to fix the needs to attract foreign direct investment inflows in the economy.

Keywords: Oil price; FDI; ARDL; VECM

JEL Classification: E20

1. Introduction

Noted recently, fluctuations in the price of oil have become a major concern in most of the oil exporting countries as it largely determines their revenue. Oil price fluctuations have also gained the attention of researchers on how it affects investment decisions in economies. Albeit, attempt made by different researchers has resulted to divergences in their conclusions. For example, Danja (2012); Pacheco-López (2014); Haque, Patnaik and Hashmi (2016) all argued that foreign

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direct investment leads to econonmic growth of oil exporting countries. Thus, in contribution to their findings, (Ekperiware, 2011) submited that Oil foreign direct invesment and non oil foreign direct investment contributes positively to the economic growth of Nigeria but non oil foreign direct investment has a greater contribution to the conomic growth than oil foreign direct investment. Ahmed (2016) contended that foreign direct invesment only leads to economic growth in non-rentier and non-Islamic oil countries through capital accumulation, technology transfer, and employment skills. Whereas; law, economic, social and political stipulation in rentier oil exporting countries and Islamic oil exporting countries do not agree with the means of economic growth through foreign direct investment.

In other vein, Gummi, Buhari and Muhammad (2017); Ademakinwa and Omokanmi (2017); Khuram and Liu (2014); Rezazadehkarsalari, Haghiri and Behrooznia (2013); Abdulkareem and Abdulhakeem (2016) all asserted that oil price has a positive impact on economic growth of oil exporting countries but oil price fluctuation has a negative impact on the growth of oil exporting countries. Yazdanian (2014) further revealed that countries that is endowed with natural resources and oil producing contries suffer from Dutch disease syndrome and resource curse. Hence, the country that welcome trade openness, and encourage technology innovation makes the most effective utilization of the resources.

However, the link between these two determinants of economic growth (foreign direct investment, and oil price fluctuation) is underdetermined as a result of divergence discovery in the literature review. Studies like: Mehta (2014); Kari and Saddam (2014) Olure, Gbadebo and Ajiteru (2015); Elheddad (2016); Quero-Virlaa (2016); Asiedu (2015); Wadud and Huson (2014); Wong, Goh and Lean (2015); Sharifi-Renania and Mirfatah (2012); Muhammad and Syed (2012); Al-Mihya (2017); and Razmi and Behname (2012) confirmed that there is a relationship between foreign direct investment and oil price fluctuation. This relationship is either positive or negative. A positive relationship is said to exist between foreign direct investment and oil price fluctuation when the price of oil increases. An increases in oil price bring about increases in growth, reducing unemployment, and lessen inflation level (Quero-Virlaa, 2016) as the positive change in oil price attracts foreign investors. On the other side, declining oil price reduces foreign direct investment inflows in an oil exporting country. Al-Mihya (2017) submitted that reduction in oil price significantly influence the volume of foreign direct investment inflows, deteriorate the currency of oil exporting country, and reduce investment inflows. On the same direction, Mehta (2014) opined negative oil price changes hampers investments decision in an economy through its influence on the general price of inputs. In total disagreement to the relationship that exist between foreign direct investment and oil price fluctuation, Dal Bianco, and Nguyen (2017) argued that oil price fluctuations have no connection to foreign

direct investment, whereas, the identifiable economic variables that determine foreign direct investment are human capital and trade openness.

The econometric approach of most of the existing studies often is based on General Autoregressive Condional Heteroscedasticity (GARCH) model (Dal Bianco & Nguyen, 2017; Olure, Gbadebo & Ajiteru, 2015; Wadud & Huson, 2014), Least Square Method (Mehta, 2014; Razmi & Behname, 2012; Udoh, 2014), Vector Error Correction Model (Kari & Saddam, 2014; Olure, Gbadebo & Ajiteru, 2016), Generalized Method of Moment Model (Elheddad, 2016; Asiedu, 2013), Structural Vector Auto Regression (Quero-Virla, 2016; Wadud & Huson, 2014; Ademakinwa & Omokanmi, 2017), Augmented Dickey Fuller (Shafi & Liu, 2014; Udoh, 2014), Cointegration Method (Sharifi-Renania & Mirfatah, 2012; Shafi & Liu, 2014; Udoh, 2014), Lagrange Multiplier. (Worg, Goh & Lean, 2015)

To the best of our knowledge, only few studies have been carried out within the context of Nigeria. The few include; Ademakinwa and Omokanmi (2017) who used Structural Vector Auto Regression (SVAR), while, Udoh (2014) used OLS to capture the relationship between foreign direct investment and oil price fluctuation in Nigeria.

This study therefore differs to examine oil price fluctuations and foreign direct investment nexus in Nigeria using Auto-regressive Distributed Lag (ARDL) to analyse the short-run and long-run nexus and also check the causal relationship using VECM granger causality test. This study is spurred in the context of Nigeria being country that largely depends on crude oil as it mainstay and reacts to oil price fluctuations. Also, since oil price largely determined the growth of the economy, indirectly the flow of foreign investment would also be affected by fluctautions in oil price as investors are most interested in the sustainability of their investment and the profit they make.

The rest of the study is divided into five sections. Section two holds the literature review, section three presents the data source and methodology, section four contains the analytical framework, and section five concludes and recommend from the findings.

2. Literature Review

The theoretical linkage of most of the empirical studies on the relationship between foreign direct investment and oil price fluctuations is shown in various theories that considered foreign direct investment as an important factor of economic growth through research and development on technology. Among the theories are: Solow (1956), Romer (1986), Lucas (1988) and Mankiw et al (1992) which consistently gained the attention of many researchers in the literature. On the empirical front, in

the developed and developing countries, studies such as; Dal Bianco and Nguyen (2017) used GARCH techniques to incorporate the impacts that oil price shocks, and exchange rate volatility had on foreign direct investment in Latin America countries between 1990-2012. They however confirmed the establishments of real option theory in Latin America countries which indicates negative impact of exchange rate volatility on foreign direct investment; and absence of connection between foreign direct investment and oil price fluctuation. The presume instruments that attract foreign direct investment in Latin America countries are human capital, and trade openness. In contention, Dias, Dias and Hirata (2014) posited that in Brazil, exchange rate does not play any role in explaining foreign Direct Investment (FDI) inflow; on the other hand, the productivity shocks of the United State economy had a negative impact on FDI inflows, due to the impact of productivity on the relative prices of the economies. In Colombia, Quero-Virlaa, (2016) argued that oil price fluctuation has significant impact on macroeconomic variable. In which, 1% increases in oil price generates 0.04% increases in growth, 0.12% reduction of unemployment, 0.09% decrease in inflation which lead them to a conclusion that oil price fluctuation has significant impact on foreign direct investment.

Using panel data model for six (6) oil exporting GCC countries to integrate natural resources and foreign direct investment in GCC countries, Elheddad (2016) realised a negative relationship between natural resources abundance and foreign direct investment in oil exporting GCC countries with a negative correlation between foreign direct investment inflow and GDP of oil exporting GCC countries. In affirmation; Kari and Saddam (2014) used VECM model to analyze a long-run dynamic analysis of foreign direct investment, growth and oil export in GCC countries. Their finding attest that oil price shocks repulse foreign direct investment, and distort economic growth; whereas, a shock in foreign direct investment inflow adversely affect oil export and the economic growth, indicating that foreign direct investment has greater effect on the economic growth of GCC countries than crude oil export. In Sub Saharan African countries, Asiedu (2015) examined the relationship between foreign direct investment, natural resources, and institutions. The findings showed that natural resources negatively influence foreign direct investment where as good institutions lessen the negativity of natural resources on foreign direct investment.

Employing Ordinary Least Squares regression to incorporate the impact of oil price on South Asian Countries; Muhammad and Syed (2012) submitted that oil price fluctuation has impact on macroeconomic variables in South Asian countries. In that, an increase in oil prices leads to an increase in inflation rate, and foreign direct investment. In contrary, Mehta (2014) discovered a negative impact of oil price fluctuation on investment in the country of Pakistan, leading to deterioration of economic growth as a result of its influence in promoting inflation which

increases investment cost in the country. Using GARCH and SVAR in examining oil price volatility and investment responses in Thailand, Wadud, and Huson (2014) proved that oil price fluctuation has negative effect on the aggregate real investment of the economy.

In the study of foreign direct investment in Islamic oil exporting countries, Razmi and Behname (2012) noticed a negative effect of oil extraction on foreign direct investment as a result of over dependence on oil extraction which plagues a high risk on these economies. Whereas, fluctuation in world oil price causes an increase in economic volatility in these countries. In the economy of Russia, Shafi and Liu (2014) found a positive impact of oil price and exchange rate on economic growth, while foreign direct investment and other macroeconomic variables was found to have significant positive relationship with exchange rate except export that exhibit negative relationship with real effective exchange rate in the short run. Sharifi-Renania and Mirfatah (2012) in evaluating the determinant of FDI inflow in Iran using co-integration approach discovered that trade openness, GDP and exchange rate possess a significant positive impact on FDI while exchange rate and world crude oil prices exhibit a significant negative impact on the flow of FDI inflow in Iran.

Using Lagrange Multiplier (LM) unit root test to investigate the nexus that exist between foreign direct investment, oil prices and global financial crisis in Singapore; Wong, Goh, Lean (2015) discovered that external shock and foreign direct inflow are closely related in the short run, whereas the external shocks of foreign direct investment in Singapore is attributed to Mexican crisis, the Asian financial crisis, the global fund crisis, and high oil prices. In analyzing economic crisis in Kurdistan region and its impact on foreign direct investment, Al-Mihya (2017) deduced the following: foreign direct investment inflows is adversely affected by economic crisis; reduction in price of oil has a significant influence on the volume of foreign direct investment inflows in the country; volatility in the country currency also contributes to the reduction in investment flows; and foreign investment take a smaller percentage of the total investment in the country.

In Nigeria, Ademakinwa and Omokanmi (2017) noted that oil price has a significant positive influence on foreign direct investment (FDI) and economic growth, but expected to have a negative impact on foreign direct investment and economic growth, due to its effects of uncertainty and destabilization of effective fiscal management of crude oil revenue. From a different view, Olure, Gbadebo and Ajiteru (2014) argued that in the long run, world oil price exhibits a negative relationship with foreign direct investment in Nigeria. They further discovered that gross domestic product, degree of trade openness, exchange rate, inflation rate, and world oil price justify the variations in Nigeria's foreign direct investment by 88%. Using Ordinary Least Squares (OLS) estimation method, Udoh (2014) claimed that

foreign direct investments has no significant relationship with oil export, and the entire Nigerian economy, due to misappropriation of funds, and poor administration.

From the related literature reviewed, the discrepancies among the studies may be concluded to be as a result of the, methodology, scope and data used for each study. This study therefore contributes to the ongoing argument in literature by investigating the nexus between oil price fluctuations and foreign direct investment using ARDL econometric technique and VECM granger causality test to analyse the short-run and long-run effect of oil price fluctuations on foreign direct investment and also check the direction of causality between oil price and FDI in an emerging oil exporting country like Nigeria.

3. Nature of Data and Methodology

The study makes use of secondary data spanning from 1970 to 2015 calculated and some sourced from the World Development Indicators (2016). Foreign Direct Investment (FDI) is proxy as Foreign Direct Investment net inflows (% of GDP), sourced from WDI (2016). Oil price is captured using Brent price of Oil per barrel in US$ (money of the day) sourced from Bp statistics. The economic activities are captured using the GDP per capita (Current LCU). Trade openness is calculated by the sum of export and import of goods and services (sourced from WDI, 2016) in the economy as a ratio of GDP at local currency units (WDI, 2016). Exchange rate is proxy as the official exchange rate (LCU, per US$, period average) from WDI (2016). While the labour strength of the economy was captured using the population growth rate of the economy, sourced from WDI (2016). This study followed the model of Dal Bianco and Nguyen (2017) drawn from the works of Lemi and Asefa (2001), Ajuwon (2013), Yousaf et al. (2013) and Mahmood et al. (2011). The Their works lean on the augmented Solow (1956) growth model which incorporate technology, capital and labour strength, and human capital as an important factor of growth determinant in the economy. However, following these studies, the model for this study is specified as;

$$FDI_t = \beta_0 + \beta_1 InOP_t + \beta_2 InGDP_t \, \beta_3 TR_t + \beta_4 InEXR_t + \varepsilon_t - - - - - - (1)$$

$\beta_1 - \beta_4$ are the variables coefficients which makes the model a linear model. FDI is foreign direct investment measured as FDI net inflows (as a % of GDP), OP is oil price measured as brent oil price in US$ (money of the day), GDP is measured as gross domestic product per capita (LCU), TR is trade measured as the ratio of import and export to GDP. EXR is exchange rate measured as the official exchange rate naira to dollar.

In order to estimate equation (2) the associated conditional standard autoregressive distributed lag ARDL (p, j_1, j_2, j_3, j_4) long run model for FDI_t can be expressed as:

$$\text{FDI}_t = c_0 + \sum_{q=1}^{p} \beta_1 \text{FDI}_{t-i} + \sum_{q=0}^{j_1} \beta_2 InOP_{t-i} + \sum_{q=0}^{j_2} \beta_3 InGDP_{t-i} + \sum_{q=0}^{j_3} \beta_4 \text{TR}_{t-i}$$

$$+ \sum_{q=0}^{j_4} \beta_{5\_} InEXR_{t-i} + \varepsilon_t - - - - - - - - - - - - - - - \ (2)$$

The short-run dynamic parameters of the effect of oil price fluctuations on foreign direct investment are estimated using the model specified below as;

$$\Delta FDI_t = \vartheta + \sum_{q=1}^{p} \rho_1 \Delta In\text{FDI}_{t-i} + \sum_{q=1}^{j_1} \rho_2 \Delta OP_{t-j} + \sum_{q=1}^{j_2} \rho_3 \text{GDP}_{t-j} + \sum_{q=1}^{j_3} \rho_4 \Delta TR_{t-j}$$

$$+ \sum_{q=1}^{j_4} \rho_5 \Delta InEXR_{t-j} + \delta ecm_{i-1} + \varepsilon_t - - - - - - - - - - -(3)$$

From equations 2 and 4, $\beta_1 - \beta_5$ represents long-run multipliers of the variables. While, $\rho_1 - \rho_5$ reprsent the short-run multipliers of the variables, while the long-run and short-run intercept of the models are $c_0 \ and \ \vartheta_0$ and $j_1 - j_4$ are the optimal lags length of each of the variables as revealed in the results.

In order to test for the long-run cointegration relationship among the variables, we employed the ARDL bounds test to test the hypothesis (null and alternative) to reject or accept. The null hypothesis of no long-run cointegration is stated as $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ against the alternative hypothesis of long-run coitegration existence stated as $H_1: \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq 0$. The F-Statistics and the Upper and Lower Bound [I(1) and I(0)] class of the results are used to validate the result decision. If the F-statistics is greater than the Upper bound we accept the alternative hypothesis that a long-run cointegration relation exists, if otherwise, we do not have any reason to reject the null hypothesis of no long-run cointegration. If the F-Statistics lye in between, then our result is inconclusive.

To analyse the causal link between Oil price fluctuations and foreign direct investment, we used the VECM granger causality model which permits variables to be endogenised in a vector. The VECM granger causality model is specified as;

$$\Delta X_t = \mu_t + \sum_{i=1}^{\rho-1} \Gamma_i \ \Delta X_{t-1} + \Pi X_{t-\rho} + \varepsilon_t - - - - - - - - - - - - - -(4)$$

X_{it} is a 5x1 vector matrix of the endogenous variables (FDI, OP, GDP, TR and EXR). FDI is foreign direct investment, OP is oil price, GDP is gross domestic product, TR is trade, and EXr is Exchange rate. $\Gamma_i \Delta X_{t-1} + \Pi X_{t-\rho}$ is a vector of

country specific effects for Nigeria with a lag operator and ϵ_t is a vector of idiosyncratic errors.

4. Results and Discussions

4.1. Descriptive Statistics

Table 4.1 presents the descriptive statistics for the study. The result revealed that the mean value of the variables lies in between their minimum and maximum values except trade which implies the expectation of the effect of trade openness may have a different turn out from the expectation. The mean value implied that average changes in the variables are small except trade. The skewness result revealed that FDI GDP and TR positively skewed to the right, while OP and EXR negatively skewed to the left. The Jarque-Bera statistics revealed that all the OP and GDP are normally distributed, while FDI, EXR and TR are not normally distributed as their probability values are less than 10% while OP and GDP are 10% and above.

Table 4.1. Descriptive Statistics Result

	FDI	InOP	InGDP	InEXR	TR
Mean	2.607264	3.16374	8.93281	2.34699	36643.91
Median	2.302586	3.181472	8.730344	2.968195	3589.81
Maximum	10.83256	4.715545	13.16614	5.259787	206517.1
Minimum	-1.15086	0.587787	5.07299	-0.60371	31.40865
Std. Dev.	2.170242	0.975763	2.658777	2.314807	57256.71
Skewness	1.781939	-0.67682	0.157175	-0.09832	1.594895
Kurtosis	7.088366	3.730236	1.592043	1.330319	4.38362
Jarque-Bera	56.38061	4.533998	3.988889	5.417452	23.17089
Probability	0.00000	0.103623	0.136089	0.066622	0.000009
Sum	119.9342	145.532	410.9093	107.9615	1685620
Sum Sq. Dev.	211.9478	42.84508	318.1093	241.125	1.48E+11
Observations	46	46	46	46	46

Source: Authors Computation, 2018

4.2. Correlation Matrix Test

The Correlation test is carried out to avoid the problem of multicollinearity. That is, if the variables are not related in order to better explain the phenomenon. From the result, it was revealed that none of the variables are correlated with value 1. OP and TR had a weak negative correlation with FDI, GDP an EXR had a weak positive correlation with FDI. We therefore concluded that there is no problem of multicollinearity among the variables. The result is presented below in table 4.2.

Table 4.2. Correlation Matrix Result

	FDI	InOP	InGDP	InEXR	TR
FDI	1.00000	-0.07727	0.209575	0.339996	-0.0655
InOP	-0.07727	1.00000	0.767996	0.640142	0.726553
InGDP	0.209575	0.767996	1.00000	0.965886	0.823392
InEXR	0.339996	0.640142	0.965886	1.00000	0.714771
TR	-0.0655	0.726553	0.823392	0.714771	1.00000

Source: Authors Computation, 2018

4.3. Unit Root Test Result

From the unit root test result presented in table 4.3, it was observed that FDI turned out stationary at levels for both none, intercept, trend and intercept, while at levels, OP was stationary considering only intercept and stationary for none, intercept and trend and intercept after first differencing. Other variables (GDP, EXR and TR) was found to be stationary at first difference for none, intercept and trend and intercept except POP which was only stationary considering none and was after first differencing. This implies that the data for POP does not really behave well and retaining it in the model may cause a contradictory result, we therefore drop the variable in the model.

Table 4.3. Unit Root Test Results

		Level	
	None	intercept	trend and intercept
FDI	-2.18141***	-3.61767***	-3.60384***
InOP	0.717641	-2.73795***	-2.48421
Ingdp	6.406439	0.273321	-1.96686
pop	-1.48122	-2.58685	-2.62428
Inexr	1.850062	-0.24287	-1.62069
TR	0.006635	-0.61326	-1.8259
		1st Difference	
	None	intercept	trend and intercept
FDI	-9.58858***	-9.48266***	-9.38569***
InOP	-5.65967***	-5.83687***	-6.02529***
Ingdp	-3.60541***	-6.10988***	-6.05893***
pop	-2.5456***	-2.44476	-2.57457
Inexr	-4.65921***	-5.38428***	-5.32037***
TR	-4.9258***	-4.94294***	-4.8374***

Source: Authors Computation, 2018

***, **, * implies stationary of the variables at 1%, 5%, and 10% significance level

4.4. Optimal Lag Length

The optimal lag length is important to be determined in order to know the appropriate lag length to use for the model specified. The Akaike Information Criterion (AIC) and the Scharwz Information Criterion (SC) is used for this study.

The result revealed an optimal lag length structure of (1) for the endogenised model: FDI, InOP, InGDP, TR, and EXR. This implies that the effect of the outcome of the previous year on the current year is explained. We however estimate the parameters using the optimal lag length of (1). The result is presented in table 4.4.

Table 4.4. Optimal Lag Length Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-740.012	NA	7.70E+08	34.65171	34.8565	34.72723
1	-533.81	354.8594*	169988.7*	26.22371*	27.45245*	26.67683*
2	-512.456	31.78189	211510.9	26.39332	28.64601	27.22404
3	-498.062	18.07671	394267.9	26.8866	30.16325	28.09493

Source: Authors Computation, 2018

4.5. ARDL Bounds Test

From the ARDL bounds test result, we found that a long-run cointegratin relationship exist among the variables specified in the model as it reveals a F-statistics value which is greater than the upper and lower boundary of the result at 5% and 10% level of significance. The result is presented in table 4.5 below.

Table 4.5. ARDL Bounds Test Results

Test Statistic	Value	K
F-statistic	4.886353	4
Critical Value Bounds		
Significance	**I0 Bound**	**I1 Bound**
10%	3.03	4.06
5%	3.47	4.57
2.50%	3.89	5.07
1%	4.4	5.72

Source: Authors Computation, 2018

4.6. Long-run ARDL

In the long-run, oil price, output and trade had a negative impact on foreign direct investment in Nigeria but insignificant. This implies that one percent change in oil price, gross domestic product and trade brings about 32 units, 1.70 units and 0.000007 units decrease in foreign direct investment inflows in Nigeria. Exchange rate revealed a positive and significant impact on foreign direct investment at 10% level of significance. This implies that one percent increase in exchange rate leads to 1.88units increase in foreign direct investment inflows.

Table 4.6. Long-run ARDL Result

Cointeq = FDI - (-0.3196*LOGOP -1.6971*LOGGDP + 1.8811*LOGEXR				
-0.0000*TR + 12.6246 + 0.0895*@TREND)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
InOP	-0.3196	1.025066	-0.31178	0.7569
InGDP	-1.69714	1.598811	-1.0615	0.2952
InEXR	1.881131	1.100285	1.709677	0.0955
TR	-7E-06	0.000016	-0.44084	0.6618
C	12.62463	8.484411	1.487979	0.145
@TREND	0.089459	0.271086	0.330002	0.7432

Source: Authors Computation, 2018

4.7. Short-run ARDL

As presented in table 4.7, the result reveals that the variables individually in the short-run have the same signs they have in the long-run, but different values. One percent increase in oil price, output and trade, brings about, 21units, 1.13 units and 0.000005 unit fall in foreign direct investment inflows in the short-run. The overall result reveals that 67% deviations in foreign direct investment in short-run are corrected by the independent variables in the long-run annually. This implies that the independent variables are capable of correcting 67% fluctuations in foreign direct investment inflows at the point of convergence.

Table 4.7. Short-run ARDL Result

Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D(InOP)	-0.21402	0.694007	-0.30838	0.7595
D(InGDP)	-1.13648	0.986741	-1.15175	0.2566
D(InEXR)	1.259685	0.692802	1.818247	0.0769
D(TR)	-5E-06	0.000011	-0.43116	0.6688
D(@TREND())	0.059906	0.179319	0.334072	0.7402
ECM(-1)	-0.66964	0.150163	-4.45944	0.0001

Source: Authors Computation, 2018

4.8. VECM Granger Causality Test

The VECM test revealed there is no direction of causality between oil price fluctuations and foreign direct investment in Nigeria. This implies that the fluctuations in oil price do not explain the attraction of foreign direct investment inflows in Nigeria. The result is present in table 4.8.

Table 4.8. VECM Granger Causality Test Result

Dependent variable: D(FDI)			
Excluded	Chi-sq	Df	Prob.
D(InOP)	0.559703	1	0.4544
D(InGDP)	1.998572	1	0.1574
D(InEXR)	0.317288	1	0.5732
D(TR)	0.00381	1	0.9508
All	2.565702	4	0.6329

Source: Authors Computation, 2018

From the findings, it was noted that while the result coincide with some previous studies, it also argued against the submission of some studies. On the relationship between oil price and foreign direct investment the study disagree with the findings of Quero-Virlaa, 2016; Muhammad and Seyed, (2012); Almihya (2017) Ademakinwa and Omokanmi, (2017) but agree with the findings of Razmi and Behname, 2012; Elhedad, 2016; Kari and Saddan, 2014; Mehta, 2014; Wadud and Hudson, 2014; and Udoh, 2014; that an insignificant negative link exist between oil price fluctuations and foreign direct investment. This is because the economy depends on oil extraction as its major production activities which affect the investment inflows whenever there are fluctuations in the global price of oil. For trade, gross domestic output and exchange rate, the study argued against the results submitted by Shafi and Liu, 2014; Dal Bianco and Nguyen, 2017, that there is a positive link between exchange rate and foreign direct investment inflows in conformity with Sharifi-Renania and Mirfatah (2012). Also in conformity with Dias et al., 2014; Elheddad, 2016; the study concludes that it appears the same for the economy of Nigeria that GDP and trade negatively relates to foreign direct investment inflows. The study also affirm the causal link result in agreement with the work of Dal Bianco and Nguyen, 2017; that no causal link between oil price and foreign direct investment as FDI is mainly determined by internal factors.

4.9. Diagnostic Test

To test the stability of the model specified for this study we ran a diagnostic test. The tests include RAMSEY RESET tests, Heteroscedaticity Test, and Serial Correlation LM test. The results are presented in table 4.9. Ramsey Reset test confirmed that the model specification is right, Serial correlation confirmed absence of auto correlation problem in the model (The decisions are validated by the F-statistics and Probability values which are greater than 10% level of significance) and the Heteroscedaticity test revealed there is a problem of heteroscedaticity in the model with a probability value of less than 10%. But the study retained the model since it was confirmed right and problem of auto-correlation absence.

Table 4.9. Diagnostic Results

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.449993	Prob. F(1,37)	0.5065
Ramsey RESET Test			
	Value	df	Probability
F-statistic	0.001163	(1, 37)	0.973
Heteroskedasticity Test: Breusch-Pagan-Godfrey			
F-statistic	3.141723	Prob. F(5,39)	0.0177

Source: Authors, 2018

The study also tests for the validity and stability of the model using the Cumulative Sum of Chart and Cumulative Sum Square (CUSUM & CUSUMQ). The empirical stability of the model is validated if the plots of CUSUM and CUSUMQ lie within the critical bounds value at 5% level of significance.

The plots of CUSUM and CUSUMQ for the relationship between oil price fluctuations and foreign direct investment inflows model are within their 5% critical bound which implies that the model is stable and valid enough to explain the phenomenon.
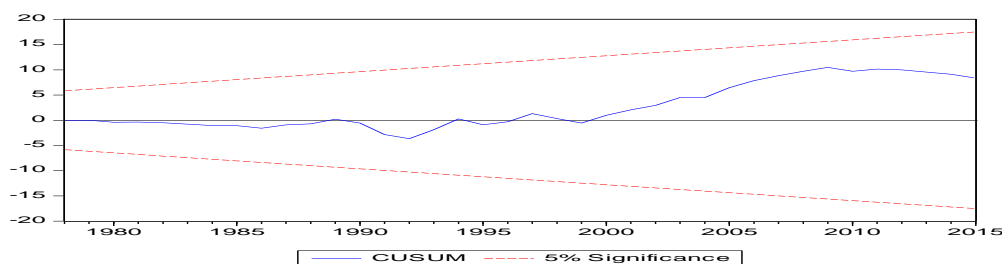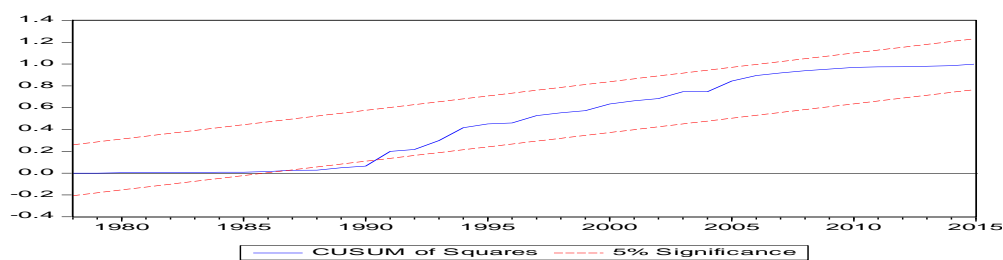

Figure 2. CUSUM Test

Figure 3. CUSUM of Squares Test

5. Conclusion and Recommendation(s)

This study investigates the impact of oil price fluctuations on foreign direct investment in Nigeria. Autoregressive Distributed Lag (ARDL) and VECM granger causality test are used to analyse the data spanning from 1970 to 2015. It was noted from the findings that both in the long-run and short-run oil price impacted negatively on foreign direct investment in Nigeria, but reveals that the impact is not significant in determining the existence of foreign investment in the country. From the VECM granger causality test, it was revealed that oil price does not granger cause foreign direct investment in Nigeria, which also implies that the existence or attraction of foreign investment into the country is not determined by oil price fluctuations. Other variables included in the model such as gross domestic product per capita and trade revealed a negative relationship on foreign direct investment both in the long-run and short-run. This implies that the output and trade activities in the economy over the years under study are not in the direction of attracting foreign direct investment inflows into the country. Exchange rate on the other hand revealed a positive nexus with foreign direct investment, which implies that the value of the country currency against the US$ considering the scope of the study attracts foreign direct investment. The study therefore concludes that fluctuations in oil price are not a significant factor that determines foreign direct investment inflows into the economy. From the findings, the study recommends that government should structure their plans in such a way that the boom period of oil price should be well managed towards activities (such as trade incentives and output promotion) that attract foreign direct investment inflows into the economy.

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