

# Foreign Direct Investment Inflows and Oil Exports in Nigeria: An Empirical Perspective

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## Abstract

This paper examined the long run relationship between FDI inflows and oil exports in Nigeria which most previous studies have not fully explored in recent times. Data were collected from CBN Statistical Bulletin and UNCTAD investment report from 1990 to 2016, and various diagnostic tests such as Unit Roots and Johansen co-integration were conducted. Thereafter, Dynamic Ordinary Least Square (DOLS) and Granger Causality Test were adopted to address the objective of this study. It was established that a significant positive relationship exists between FDI inflows and oil exports in Nigeria. This shows that what drives foreign investors in Nigeria is crude oil which constitutes the major share of the nation's exports. In the same vein, there is an existence of a unidirectional causality which runs from FDI inflows to oil exports in Nigeria. This further shows that FDI inflows motivate oil exports in the country. Due to the significant findings that emerged from this study, it could be recommended that when attraction of FDI inflows are the target of the policy makers in Nigeria, improving variables like oil exports and inflation rate will induce the inflows of cross border investment accordingly in the long run. Also, the Nigerian government should be committed to effective exchange rate management which is sensitive to FDI inflows in the country.

**Keywords:** FDI Inflows, Oil Exports, DOLS, Granger Causality, Nigeria.

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## INTRODUCTION

The critical role foreign direct investment plays in the development of global economy cannot be overemphasized because the spillovers of FDI inflows in a host country has been seen in the forms of increasing GDP growth, job creation, and social development.

However, foreign direct investment (FDI) inflows could be traced to the colonial era in Nigeria, as a result of the exploitation of the nation's natural resources. The advent of oil in 1958 and especially the oil boom of 1970s sparked off sporadic inflows of FDI in Nigeria [1]. In the last four decades, more than 80% of foreign earnings that accrued to Nigeria have been coming from the oil sector [2]. This makes the Nigerian economy to be largely dependent on revenues from oil exports. As a matter of fact in the early 2000s, about 83% of revenue in Nigeria was derived from oil exports alone [3]. This shows the mono cultural nature of the Nigerian economy.

Consequently, the flow of FDI in Nigeria has been skewed in favour of oil and gas sector over time. In the year 2005, the oil and gas sector accounted for 90% of FDI inflows in Nigeria, and this story has always been the same over time [4]. Having noted that the lion share of FDI inflows go to the direction of oil and gas in Nigeria, it is imperative that the spillover effects of the foreign capital on crude oil exports should be empirically verified in order to draw important recommendations for the policy makers in the country. In addition to this fact, the Nigerian economy highly depends on oil exports for its survival. Therefore, it is necessary that research be always geared towards this sector of the economy especially in a time when volatility in the global price oil products is the order of the day. In view of the above, this study examines long run relationship between FDI inflows and oil exports. The uniqueness of this work also lies in the application of dynamic model in addressing the objective of the study in which bulk of past studies have not paid adequate attention to.

Besides introduction, the rest of the paper is arranged as follows: section two examines the critical review of relevant literature and section three accounts for model specification, estimation, discussion of results and policy recommendation

## LITERATURE REVIEW

### Theoretical Review

#### FDI Capital Theory

The Capital Theory otherwise known as the Rate of Return theory was first proposed by MacDougall [5] and later reviewed by Kemp [6]. The underlining assumptions of the theory were a perfectly competitive market [7, 8]. It was suggested from the theory that capital flows to a high-rate return country from a low-rate [9]. In other words, the movement of FDI is initiated from economies that are very rich in capital with low rate of returns and migrate to economies which have low capital but high rate of returns. Therefore, foreign investors are attracted to invest in economies where the marginal return is equal to or greater than the marginal cost.

However, the FDI Capital Theory could provide a clear explanation for the phenomena which are the motivating factors for import substitution industries established in developing economies like Nigeria. Available evidence shows that developing countries were able to attract FDI in the early 1960s owing to the high demand for consumer goods such as safety matches, sugar, soap and clothing. Imports were the only source of commodities to developing countries. Non availability of essential commodities necessitated the establishment of FDI projects with a view to taking the advantage of the high returns that accrued to the early investors in the market. It is instructive to state that horizontal integration is connected with high-return expectation. This is because the driving force behind MNEs is the availability of technology which could bring about low marginal costs and anticipated high returns [10].

Meanwhile, an attempt to empirically verify FDI Capital Theory immediately after its emergence in the literature motivated several studies like those of Agarwal [11]; Bandera and White [12]. Their empirical propositions do not support the FDI Capital Theory. First, the role of human capital in equalizing rates of return on capital in developing countries cannot be overemphasized. In the same vein, return is not a sufficient precondition for explaining FDI inflows. In addition, capital does not automatically flow from high income to low-income countries; instead it flows from advanced economies to advanced economies, reference to Linder's Theory of Overlapping Demand. The inflows of FDI are higher in developed countries than in developing countries. In spite of the flaws attached to this theory, the Capital Theory enunciates the inflows of FDI in Africa. As a matter of fact, Africa was more of agrarian economies during the 1884 Berlin Conference.

During those periods, the continent required aggressive civilization and development, as a result of that, FDI began to flow to African countries like Nigeria.

### Empirical Review

In this sub-section, attempts are made to critically review past empirical studies that are relevant to the study. First and foremost, the impact of trade openness on FDI inflows is dependent initially on FDI motives [13, 14]. Policies connected to trade openness have been perceived to propel export-oriented FDI better than other types of FDI [15].

Consequently, Aderemi [16] uses Johansen Co integration test and dynamic ordinary least square (DOLS) to estimate the linkage between FDI, non-oil exports and economic growth in Nigeria from 1980 to 2016. It was discovered from the work that FDI contributes significantly to economic growth but the reverse is the case for non-oil exports. Akinlo [17] employs an error correction model (ECM) to investigate the nexus between FDI and economic growth in Nigeria between 1970 and 2001. The study finds an insignificant relationship between private capital and economic growth on one hand and between lagged foreign capital and economic growth on the other hand. Also, an insignificant direct link exists between exports and economic growth in the country. Olumuyiwa [18] investigates the relationship between exchange rate uncertainty and foreign direct investment in Nigeria. The emanating outcome from the study depicts that there is an inverse relationship between exchange rate and foreign direct investment in the country. In another study, Samol and Solifano [19] posit that government fiscal deficit/surplus is a significant determining factor of foreign direct investment inflows.

However, Okodua [20] examines the relationship between FDI and economic growth in Nigeria with the aid of Johansen cointegration and vector error correction model. The study reveals that a long run equilibrium relationship exists between FDI inflows and economic growth in the country. In the same vein, there is a one way feedback effect which runs from FDI to economic growth in the country. Aderemi and Aberu [21] apply granger causality technique to estimate the linkage between FDI, non-oil exports and economic growth in Nigeria from 1980 to 2016. The paper concludes that FDI granger causes economic growth and non-oil exports in the country but not the reverse.

Similarly, Aderemi *et al.*, [22] adopt impulse response and variance decomposition tests to analyze the stochastic dynamic interaction of FDI, non-oil exports and economic growth in Nigeria. The authors submit that the interactions among FDI, non-oil exports and economic growth appear very weak and do not follow a predictable pattern in Nigeria. Akanni [23]

employs ordinary least squares technique to estimate the impact of oil rents increment on the economies of African oil exporting countries. The result of the study shows that investment, oil rents and economic growth have a significant direct relationship with one another. Meanwhile, oil rents do not lead to economic growth in majority of oil-rich countries in Africa. In another perspective, Odularu [24] applies Ordinary Least Square technique alongside Cobb-Douglas production function to investigate the nexus between crude oil and economic growth in Nigeria. The author submits that crude oil production has a contributory effect on economic growth of the country, but not significant. Ogun, Egwaikkhide and Ogunleye [25] adopt Granger causality and simultaneous estimation techniques to analysis the relationship between FDI and real exchange rate in some selected Sub-Sahara African (SSA) economies. The study concludes that FDI inflow is sensitive to real exchange rate movements in SSA.

In summary, the above reviewed literature indicates that past studies on the nexus between FDI inflows and oil exports are very scarce in Nigeria in the recent times. Hence, the relevance of this study in filling the existing vacuum.

$$FDI_t = \alpha_0 + \sum_{i=0}^p \alpha_1 FDI_{t-1} + \sum_{i=0}^p \alpha_2 OILEX_{t-1} + \sum_{i=0}^p \alpha_3 EXRT_{t-1} + \sum_{i=0}^p \alpha_4 INFR_{t-1} + \varepsilon_{1t} \text{-----} (3)$$

$$OILEX_t = \beta_0 + \sum_{i=0}^p \beta_1 OILEX_{t-1} + \sum_{i=0}^p \beta_2 FDI_{t-1} + \sum_{i=0}^p \beta_3 EXRT_{t-1} + \sum_{i=0}^p \beta_4 INFR_{t-1} + \varepsilon_{2t} \text{-----} (4)$$

$$INFR_t = \gamma_0 + \sum_{i=0}^p \gamma_1 INFR_{t-1} + \sum_{i=0}^p \gamma_2 OILEX_{t-1} + \sum_{i=0}^p \gamma_3 EXRT_{t-1} + \sum_{i=0}^p \gamma_4 FDI_{t-1} + \varepsilon_{3t} \text{-----} (5)$$

$$EXRT_t = \delta_0 + \sum_{i=0}^p \delta_1 EXRT_{t-1} + \sum_{i=0}^p \delta_2 INFR_{t-1} + \sum_{i=0}^p \delta_3 FDI_{t-1} + \sum_{i=0}^p \delta_4 OILEX_{t-1} + \varepsilon_{4t} \text{-----} (6)$$

Where,

- EXRT = Exchange Rate
- OILEX = Oil Exports
- INFR = Inflation Rate
- FDI= Foreign Direct Investment

$\alpha$

is an intercept and  $\beta_1, \beta_2$  and  $\beta_3$  are slope parameters

## METHODOLOGY

Secondary data for FDI were extracted from UNCTAD database published by World Bank and oil exports, exchange rate and inflation rate data were sourced from the Central bank of Nigeria Statistical Bulletin. E-view software was employed to run the analysis.

### Model Specification

$$FDI = F(OILEX, EXRT, INFR) \text{-----} (1)$$

Equation (1) is linearized as follows to derive equation (2)

$$\ln FDI_t = \alpha_i + \beta_1 \ln OILEX_t + \beta_2 \ln EXRT_t + \beta_3 \ln INFR_t + \varepsilon_t \text{-----} (2)$$

### The Direction of Causality between FDI Inflows and Oil Exports in Nigeria

Furthermore, in analyzing the Granger causality between FDI inflows and other variables in this study, we adopted a pair-wise granger causality analysis in estimating the VAR model in equation (3-6) which states thus;

to be estimated.  $\varepsilon_t$  captures error term which is assumed to be stochastic and the subscript,  $t$  stands for the dating of variables in time periods. The a priori expectations are as follows:  $\beta_1$  and  $\beta_2 > 0, \beta_3 < 0$

## RESULTS AND DISCUSSION

Table-1: Descriptive Statistics of Annual Data Series (1990-2016)

Descriptive Statistics	LnFDI	Ln EXRT	INFL	LnOILEX
Mean	3.58E+09	101.3211	18.76926	5253.371
Median	2.19E+09	120.9702	12.22000	2993.110
Maximum	8.92E+09	253.4923	72.84000	14323.15
Minimum	1.00E+09	8.037808	5.380000	106.6265
Std. Deviation	2.58E+09	66.66267	17.75316	4981.415
Skewness	0.769560	0.022722	1.914774	0.554950
Kurtosis	2.250799	2.213479	5.424036	1.887697
Jargue-Bera	3.296469	0.698266	23.10906	2.777734
Probability	0.192389	0.705299	0.000010	0.249358
Sum	9.67E+10	2735.669	506.7700	141841.0
Sum. Sq. Deviation	1.74E+20	115541.7	8194.537	6.45E+08
Observation	27	27	27	27

Source: Author's Computation 2018

Table-1 shows the descriptive analysis of the variables of interest. This provides information about the sample series such as the mean, median, minimum and maximum values; and the distribution of the sample measured by the skewness, kurtosis and Jaque-Bera statistics. It could pinpointed that there was no wide gap between the values of mean and median of the data set, which shows that a distribution of data is nearly symmetrical. Meanwhile, the mean, mode and median

must converge before the distribution of data series can be termed perfectly symmetrical, and in cases of near symmetry, the three measures are necessarily very close. The positive values of skewness and values of kurtosis is not far from 3 as well. This attests to the symmetrical nature of the dataset. Therefore, the data could be used for further econometric analysis because the assumption of normal distribution of the data is likely to have been fulfilled.

**Table-2: Unit Root Test**

Variables	ADF Test			PP Test		
	Level	1 <sup>st</sup> Difference	Remarks	Level	1 <sup>st</sup> Difference	Remarks
LFDI	-2.9810***	-2.9862***	I (1)	-2.9810***	-2.9862***	I (1)
LOILEx	-2.9810***	-2.9862***	I (1)	-2.9810***	-2.9862***	I (1)
EXRT	-2.9810***	-2.9862***	I (1)	-2.9810***	-2.9862***	I (1)
INFL	-2.9810***	-2.9862***	I(1)	-2.9810***	-2.9862***	I(1)

\*\*\* %5 level

Source: Authors' Computation (2019)

The major problem usually linked with time series data are non-stationarity nature of the data [26]. As such any analysis based on these non-stationary data would lead to a spurious or nonsense result which could lead to sub-optimal policy implications. In order to ameliorate this problem, an attempt has been made in this paper to subject the data to a unit root test with the aid of standard Augmented Dickey-Fuller (ADF) and

Phillips-Perron (PP) tests. However, the results presented in the table above show that the variables of interest are stationary after their first differencing. This implies that these variables possess unit roots. In other words, the variables are not stationary in their native form which makes them to be integrated of order one (that is, I(1)).

**Table-3: Johansen Cointegration Test (Trace Statistics) and (Maximum Eigen value)**

Null Hypothesis	Eigen value	Trace Statistics	P-value**	Maximum Eigenvalue	P-value**
$r=0^*$	0.810061	60.90910	0.001	41.64368	0.000
$r \leq 1$	0.407011	19.26542	0.474	13.03919	0.448
$r \leq 2$	0.175813	6.226226	0.668	4.831212	0.763
$r \leq 3$	0.054362	1.395014	0.237	1.395014	0.237

Max-eigen value test indicates 1 co-integrating eqn(s) at the 0.05 level

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Source: Authors' Computation (2019)

It is worth of note to state that all the studied variables have a unit root, though they might diverge in the short run but it is likely they possess a cointegration. Owing to this, the paper adopted Johansen and Juselius [27] multivariate cointegration test to verify the existence or otherwise of long run relationship among the variables. The reported results of the trace statistics

and the maximal eigen value statistics indicate that there is at most 3 co-integrating vectors in the systems. This shows that that the variables possess a long run equilibrium relationship with one another. In order to ensure that a long run relationship among these variables is captured, Dynamic ordinary least square is utilized in this study.

**Table-4: Regression Estimates for FDI inflows and Oil Exports in Nigeria**

Dependent Variable: LnFDI			
Method: Dynamic Least Squares (DOLS)			
Variable	Coefficient	t-statistics	P-value
LnOILEXP	53.3050.5**	3.330859	0.0067
LnEXRT	-1.1708865	0.652439	0.5275
INFL	-6.871116	0.126145	0.9019
C	1.89E+09	0.746751	0.4709
R-Squared	0.865465		
Adjusted R-Squared	0.718701		

Authors' computation (2019)\*\*\*Significant at 10%, \*\*Significant at 5%,\* Significant at 1%,

Table-4 shows the estimated results of the regression analysis. All the coefficients apart from inflation rate followed the a priori expectation. In the same vein, the independent variables of the model which comprises oil exports, exchange rate and inflation rate jointly explained about 87% of the systematic variations in the dependent variable, FDI inflows leaving 13% unexplained as a result of random chance. This implies that the model adopted for this work is relatively good. Meanwhile, when the loss in the degree of freedom was adjusted, the explanatory power reduces to about 72%.

Furthermore, there is a positive relationship between FDI inflows and oil exports in Nigeria,

significant at 5% level of significance. A unit change in oil exports leads to about 53% increment in FDI inflows in the country. This implies that FDI inflow in Nigeria is very sensitive to oil exports. However, exchange rate and FDI inflows have an insignificant inverse relationship with each another. This implies that FDI inflows in the country are not sensitive to the change in the exchange rate. This finding contradicts the proposition of Ogun, Egwaikkhide and Ogunleye [25] in a similar study in SSA countries. In the same vein, FDI inflows and inflation rate have a negative relationship though not significant at 10% level of significance.

**Table-5: Pair wise Granger Causality Test**

Sample: 1990 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
EXRT does not Granger Cause FDI	25	1.27099	0.3023
FDI does not Granger Cause EXRT		0.50924	0.6085
INFL does not Granger Cause FDI	25	0.50691	0.6099
FDI does not Granger Cause INFL		0.75168	0.4844
OILEXP does not Granger Cause FDI	25	2.39377	0.1169
FDI does not Granger Cause OILEXP		4.83906	0.0193
INFL does not Granger Cause EXRT	25	1.14488	0.3383
EXRT does not Granger Cause INFL		1.74056	0.2010
OILEX does not Granger Cause EXRT	25	2.92121	0.0771
EXRT does not Granger Cause OILEXP		2.45403	0.1114
OILEXP does not Granger Cause INFL	25	1.31388	0.2910
INFL does not Granger Cause OILEXP		0.16228	0.8513

Source; Authors` Computation (2019)

This section examined the direction of causality among FDI inflows and the adopted independent variables in Nigeria within the context of Pair wise Granger Causality Test. The results presented in table 4 show that there is the existence of a unidirectional causality which runs from FDI inflows to oil exports in Nigeria. This implies that oil exports in Nigeria are motivated by FDI inflows. However, there is no causal relationship between FDI inflows and exchange rate and inflation rate.

## CONCLUSION AND RECOMMENDATIONS

This study examined the relationship between FDI inflows and oil exports in Nigeria over the period of 1990 to 2016. Consequently, the major findings in this study are summarized as follow. There is a significant positive relationship between FDI inflows and oil exports in Nigeria. This shows that what drives the interests of the foreign investors in Nigeria is oil exports which constitute the major share of the country`s exports. In the same vein, there is an existence of a unidirectional causality which runs from FDI inflows to oil exports in Nigeria. This shows that FDI inflows motivate oil exports in the country.

Finally, due to the significant findings that emerged from this study, it could be recommended that when attraction of FDI inflows are the target of the policy makers in the country, improving variables like oil exports and inflation rate will induce the inflows of cross border investment accordingly in the long run. Also, the Nigerian government should be committed to effective exchange rate management which is sensitive to FDI inflows in the country.

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