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## Foreign Direct Investment Inflows and Oil Exports: Evidence from Nigeria

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Abstract: It has been observed from the literature over time that the bulk of recent studies on Nigerian FDI inflows and exports focused on non-oil exports while exports on oil has been ignored. In order to fill this gap, the study examines the relationship between FDI inflows and oil exports in Nigeria over the period of 1990 to 2016. Consequently, various diagnostic tests were carried out with the aid of the standard Augmented Dickey-Fuller (ADF), Phillips-Perron (PP) and Johansen Cointegration tests. The authors employed Dynamic Ordinary Least Square (DOLS) and Granger Causality approach to address the objective of the study. The findings that emerged in this study are as follows; FDI has a significant positive impact on oil exports in Nigeria. This confirms that the majority of foreign capital goes to oil and gas sector in this country. However, FDI and exchange rate have a significant negative relationship in the country. Furthermore, there is an existence of unidirectional causality which runs from FDI inflows to oil exports in Nigeria. Also, a unidirectional feedback flows from oil exports to exchange rate. Therefore, this paper recommends that the policy makers in Nigeria should see foreign capital as the backbone behind the oil exports in the country. And the proceeds from oil exports should be diversified and invested in the non-oil sector of the economy in order to stimulate a favourable exchange rate which can serve as catalyst that can facilitate further inflows of FDI in the country.

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

## INTRODUCTION

Before Nigeria became an independent nation in 1960, the major driver of its economy was agriculture. The reports of the Central Bank of Nigeria in 1970 submitted that the agricultural sector contributed more than 70% of Nigeria's GDP in one hand and agricultural products accounted for about 90% of exports within these periods in question on the other hand.

However, in the past few decades, especially after the emergency of oil boom, there have been a paradigm shift in the structure of exports in Nigeria. The oil and gas sector contributed more than 98% of exports and about 83% of revenue in Nigeria in 2000 [1]. This has made the economy to be a mono-cultural in nature as it relies majorly on the proceeds from oil and gas sector only for its economic survival. Over the time, in African countries there has been a connection between inflows of FDI and oil exports in the literature. FDI inflows are unevenly distributed among countries and sectors in Africa. About 15 oil-rich countries are the major destination of FDI inflows in the continent with 75% accumulation of this cross border investment in the last two decades [2]. This statement was further reinforced by the assertion of the UNCTAD World Investment Report 2006, which enunciated that 70% of FDI inflows to West Africa found its way to the Nigerian economy and the Nigeria's oil sector alone received 90% of the FDI inflows in the country concurrently.

Meanwhile, it has been established in the literature that FDI plays a strategic role in promoting economic growth through export Goldberg and Klein [3], Calderón, Mortimore and Peres [4]. Giles and Williams [5]. Consequently, the bulk of studies on FDI inflows in Nigeria in the past decade focused on economic growth and determinants of FDI inflows in this country. See Jerome and Ogunkola [6], Herzer *et al.*, [7], Akinlo [8], Ayanwale and Bamire [9]. However, the bulk of recent studies on FDI and exports in Nigeria focused on non-oil exports while exports on oil has been ignored. See Aderemi [10], Aderemi and Aberu [11], Olayiwola and Okodua [12] and Aderemi *et al.*, [10]. Hence, there is a need to move the frontiers of knowledge in this regards and update the existing literature. Therefore, the aim of the study is to examine the link between FDI inflows and oil exports in the country.

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#### LITERATURE REVIEW

In this section, attempt has been made to critically and selectively review the relationship FDI, exports and economic growth in Africa generally and Nigeria specifically.

Okodua [13] investigates the sustainability of the FDI growth relationship in Nigeria with the aid of the Johansen cointegration and a vector error correction model. This submits that a long run equilibrium relationship exists between FDI inflows and economic growth. Similarly, the study posits that a unidirectional feedback relationship runs from FDI to economic growth.

Meanwhile, Akinlo [14] adopts error correction model (ECM) to estimate the relationship between FDI and economic growth in Nigeria running from 1970 to 2001. The estimated results indicate that there is an existence of insignificant relationship between both private capital and lagged foreign capital with economic growth. The study also concludes that an insignificant positive relationship exists between exports and economic growth in the country. Whereas, Akanni [8] investigates the relationship between oil rents increment and economic in oil exporting countries in Africa with the aid of ordinary least squares regression. The estimated regression results indicate the existence of a significant direct relationship between investment, economic growth and oil rents. It was concluded from the paper that oil rents in most oil-rich developing African countries do not promote economic growth. In the same vein, Odularu [1] utilizes Ordinary Least Square regression and Cobb-Douglas production function to examine the effect of crude oil on economic growth in Nigeria. The finding from this study corroborates that crude oil production contributes to economic growth. However, the growth has not metamorphosed to a significant improvement of the country's economy.

In another perspective, Herzer *et al.*, [7] evaluate FDI-led growth in Nigeria, Sri Lanka, Tunisia and Egypt with the aid of bivariate VAR modeling technique. This results from the study show the existence of a positive FDI-led growth in Nigeria, Sri Lanka, Tunisia, and Egypt. Similarly, the results of weak exogeneity tests indicate a bidirectional long-run causality running from FDI to economic growth in the countries selected for the study.

While examining the nexus between foreign direct investment, non-oil exports and economic growth in Nigeria between the periods of 1980 to 2016, Aderemi [10] employs Johansen Co integration test and dynamic ordinary least square (DOLS), to assert that a significant impact of FDI is felt on the Nigerian economy whereas non-oil exports proved otherwise.

However, Yasin [15] analyses the link between official development assistances and FDI inflows in 11 SSA economies for the period 1990-2003. The results from the panel data analysis indicate that FDI inflows and bilateral official development assistance have a significant direct relationship. Also, the results conclude that exchange rates, growth rate in the labour force, and trade openness have a significant direct impact on FDI. Conversely, multilateral development assistance, GDP per capita, the country's composite risk level, and the growth rate, the index for political freedom and civil liberties show otherwise.

Furthermore, Aderemi and Aberu [11] employ granger causality approach to investigate the link between FDI, non-oil exports and economic growth in Nigeria between the periods of 1980 to 2016. The authors discover the existence of a unidirectional causality which runs from FDI to economic growth in one hand and as well as to non-oil exports in in the other hand in the country. While investigating the factors that derive FDI inflows in 53 African nations within the period 1996-2008, Anyanwu [16] uses a panel analysis to establish that FDI inflows have a direct link with the following; market size, openness to trade, rule of law, foreign aid, natural resources, and past FDI inflows. But, higher financial development and FDI inflows have an inverse relationship. The author also concludes that East and Southern African sub-regions seem to have a positive disposition towards obtaining higher levels of FDI inflows.

Furthermore, Aderemi *et al.*, [10], employ impulse response and variance decomposition tests to examine the dynamic interaction of FDI, non-oil exports and economic growth in Nigeria. The results from the study show that the interactions among FDI, non-oil exports and economic growth appear very weak and do not follow a predictable pattern in the country.

Similarly, Lloyd, Ogundipe and Ojeaga [17] adopt co-integration and panel least square estimation technique to analyze the link between the impact of export diversification and composition on GDP growth and GDP per capita in ECOWAS sub region between periods of 1975 to 2007. The researchers find that export diversification alongside with manufacturing value-added index has a significant effect on per capita growth. The authors argue further that more attention should be given to what is exported than how much is exported because regions that maintain less specialization and more diversified exports usually experience higher rates of economic growth.

However, the above empirical literature reviewed indicates that studies on FDI inflows and oil exports are very scanty in Nigeria in the recent times. Hence, the relevance of this study.

## **METHODOLOGY**

In this paper, the authors made use of secondary data from 1990 to 2017 for the analysis. The data on FDI were sourced from UNCTAD database published by World Bank. Meanwhile, data on exchange rate, oil exports and inflation rate in Nigeria were extracted from the Central bank of Nigeria Statistical Bulletin on. E-Views software was employed for the running of the data.

#### MODEL SPECIFICATION

If model 1 is linearized then the model 2 could emerge as follows

$$LnFDI_t = \alpha_i + \beta 1 LnOILEX_t + \beta 2 EXRT_t + \beta 3 INFR_t + \varepsilon_t$$

### The Direction of Causality between FDI, Oil-Exports, Exchange Rate and Inflation Rate in Nigeria

In order to examine the feedback relationship between FDI, oil-exports, exchange rate and inflation rate in this paper, pairwise granger causality analysis was estimated with the VAR model in equation (3-6) specified thus:

$$FDI_{t} = \alpha_{0} + \sum_{i=0}^{p} \alpha_{1} FDI_{t-1} + \sum_{i=0}^{p} \alpha_{2} EXRT_{t-1} + \sum_{i=0}^{p} \alpha_{3} OILEX_{t-1} + \sum_{i=0}^{p} \alpha_{4} INFR_{t-1} + \varepsilon_{1t} - \cdots - (3)$$

$$OILEX_{t} = + \beta_{0} + \sum_{i=0}^{p} \beta_{1} OILEX_{t-1} + \sum_{i=0}^{p} \beta_{2} FDI_{t-1} + \sum_{i=0}^{p} \beta_{3} EXRT_{t-1} + \sum_{i=0}^{p} \beta_{4} INFR_{t-1} + \varepsilon_{2t} - \cdots - (4)$$

$$EXRT_{t} = \gamma_{0} + \sum_{i=0}^{p} \gamma_{1} EXRT_{t-1} + \sum_{i=0}^{p} \gamma_{2} FDI_{t-1} + \sum_{i=0}^{p} \gamma_{1} OILEX_{t-1} + \sum_{i=0}^{p} \gamma_{3} INFR_{t-1} + \varepsilon_{3t} - \cdots - (5)$$

$$INFR_{t} = \gamma_{0} + \sum_{i=0}^{p} \gamma_{1} INFR_{t-1} + \sum_{i=0}^{p} \gamma_{2} FDI_{t-1} + \sum_{i=0}^{p} \gamma_{3} EXRT_{t-1} + \sum_{i=0}^{p} \gamma_{4} EXRT_{t-1} + \varepsilon_{4t} - \cdots - (6)$$

From the models above,  $LnFDI_{it}$  is natural log of FDI inflows Ln OILEX is natural log of non-oil exports, EXRT is exchange rate, INFR is inflation rate and  $\varepsilon$  captures error term. Meanwhile,

t = 1990-----2017.  $\propto$  is an intercept and  $\beta$ 1,  $\beta$ 2 and  $\beta$ 3 are slope parameters.

The estimation of model 2 would give us the results of the relationship that exists between the variables of interest in the study.

### RESULTS AND DISCUSSION

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

Descriptive Statistics	LnFDI	LnOILEX	EXRT	INFR
Mean	21.74050	7.756408	101.3211	18.76926
Median	21.50762	8.004068	120.9702	12.22000
Maximum	22.91100	9.569633	253.4923	72.84000
Minimum	20.72626	4.669332	8.037808	5.380000
Std. Deviation	0.739005	1.596351	66.66267	17.75316
Skewness	0.191924	-0.606195	0.022722	1.914774
Kurtosis	1.556313	2.105844	2.213479	5.424036
Jargue-Bera	2.510516	2.553080	0.698266	23.10906
Probability	0.285002	0.279001	0.705299	0.000010
Sum	586.9935	209.4230	2735.669	506.7700
Sum.Sq. Deviation	14.19932	66.25675	115541.7	8194.537
Observation	27	27	27	27

Source: Authors' Computation (2018)

The table-1 above shows different descriptive statistics of the data employed for the analysis. The values of mean and median of FDI are very close ditto for oil exports. This attests to the normal distribution of data used to capture the major variables of interest. A perfect symmetry is attributable to a distribution if mean, mode and median values converged. See Karmel and Polasek [18]. Therefore, the mean values of FDI are 21.74050 and 21.50762, while that of oil

exports are 7.756408 and 8.004068 respectively. These figures show a case of a near symmetrical nature of the distribution of the annual data utilized for this analysis. Similarly, the values of Jargue-Bera statistics and Kurtosis are the important factors that determine the normality or asymptotic properties of a particular series. The table above indicates that all annual data series for this work, are normally distributed.

**Table-2: Unit Root Test** 

Variables	ADF Test		PP Test			
	Level	1 <sup>st</sup> Difference	Remarks	Level	1 <sup>st</sup> Difference	Remarks
Ln FDI	-2.981038**	-2.986225**	I(1)	-2.981038**	-2.986225**	I (1)
LnOILEx	-2.981038**	-2.986225**	I(1)	-2.981038**	-2.986225**	I (1)
EXCHR	-2.981038**	-2.986225**	I(1)	-2.981038**	-2.986225**	I (1)
INFL	-2.981038**	-2.986225**	I(1)	-2.981038**	-2.986225**	I(1)

\*\* %5 level

Source: Authors' Computation (2018)

The table above shows the results of the estimated standard Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests employed to investigate the existence or otherwise of stationarity of time series data in this study. Consequently, it could be established that these variables of interest are stationary after first differencing. This connotes that the variables have unit roots.

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

: Jonansen Com	itegration 1 es	t (1 race Stati	stics) and (Maxi	mum Łige
Date: 11/28/18	Time: 06:48		,	
Sample (adjuste	Sample (adjusted): 1992 2016			
Included observations: 25 after adjustments				
Trend assumpti	on: Linear dete	erministic trend	1	
Series: LFDI Lo	OILEX EXCH	RATE INFL		
Lags interval (i	n first differend	ces): 1 to 1		
Unrestricted Co	integration Ra	nk Test (Trace	<u>.)</u>	
Hypothe	esized	Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.810951	60.90910	47.85613	0.0019
At most 1	0.406411	19.26542	29.79707	0.4740
At most 2	0.175723	6.226226	15.49471	0.6688
At most 3	0.054272	1.395014	3.841466	0.2376
Trace test indic	cates 1 cointegr	rating eqn(s) at	the 0.05 level	
* denotes rejec	tion of the hyp	othesis at the (	0.05 level	
**MacKinnon-	Haug-Micheli	s (1999) [19] p	-values	
Unrestricted Co	integration Ra	nk Test (Maxi	mum Eigenvalue	)
Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.810951	41.64368	27.58434	0.0004
At most 1	0.406411	13.03919	21.13162	0.4486
At most 2	0.175723	4.831212	14.26460	0.7630
At most 3	0.054272	1.395014	3.841466	0.2376
Max-eigenvalu	e test indicates	1 cointegratin	g eqn(s) at the 0.	05 level
* denotes rejec	tion of the hyp	othesis at the (	0.05 level	
**MacKinnon-Haug-Michelis (1999) [19] p-values				

Source: Authors` Computation (2018)

Recall that all the variables in this study are I (1), it is possible they possess a long run equilibrium relationship. In view of the above, the authors utilized the technique of Johansen and Juselius [20] multivariate cointegration test. The estimated results of the multivariate cointegration analysis reported in table 3 implies that there is at most 3 cointegrating vectors in the systems. From the trace statistics and the maximal eigenvalue statistics, it was observed that there is existence of at most 3 cointegrating vectors possess a long run equilibrium relationship with one another which may likely show some adjustment to short run disequilibrium via one channel. In order to capture the long run relationship among these variables, this study employed a dynamic ordinary least square approach.

Table-4: The Impact of Foreign Direct Investment on Oil-Exports in Nigeria

Table-4. The impact of Foreign Direct investment on On-Exports in Nigeria					
Dependent Variable: LFI	OI				
Method: Dynamic Least	Squares (DOLS)				
Date: 11/28/18 Time: 0	6:50				
Sample (adjusted): 1992	2015				
Included observations: 24	4 after adjustmen				
Cointegrating equation d	3				
Fixed leads and lags spec	cification (lead=1	, lag=1)			
Long-run variance estima	Long-run variance estimate (Bartlett kernel, Newey-West fixed bandwidth = 3.0000)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.	
LOILEX	1.099253	0.127414	8.627439	0.0000	
EXCHRATE	-0.014118	0.002945	-4.794094	0.0006	
INFL	0.015251	0.005812	2.624288	0.0236	
С	14.41531	0.839449	17.17235	0.0000	
R-squared	0.956523	Mean dependent var		21.80047	
Adjusted R-squared	0.909093	S.D. dependent var		0.723749	
S.E. of regression	0.218216	Sum squared resid (		0.523801	
Long-run variance	0.034753				

Source: authors' computation (2018)

The table-3 above indicates that the variable FDI has a significant positive relationship with oil exports in Nigeria. The coefficient of 1.099253 means that a unit changes in FDI inflows would result in more than proportionate increase in oil-exports in the country by1.099253. This level of impact could be attributable to the dominant roles in which foreign investors have been playing in the oil and gas sector of the Nigerian economy. Similarly, FDI inflows and inflation rate have a significant positive relationship in Nigeria. A unit change in inflation rate causes increment in FDI inflows by 0.015251 in the country. However, FDI and exchange rate have a significant negative relationship in the country. A unit change in exchange rate reduces FDI inflows by 0.014118 in the country. This finding is reinforced by the research work of Akinkugbe [21] Udoh and Egwaikhide [22] who asserted that exchange rate volatility discourages FDI inflows in Nigeria. Despite the fact that different methodologieswere adopted.

In addition, oil exports, exchange rate and inflation adopted as explanatory/ independently variables of the model jointly explained about 96% of the systematic variations in the dependent variable, FDI inflows in Nigeria. Whereas, 4% was left unexplained as result of randomchance. This shows that the fitness of this model is good for the analysis. Consequently, the explanatory power reduced to 90% when the loss in the degree of freedom was adjusted

Table-5: The Direction of Causality between FDI, Oil-Exports, Exchange Rate and Inflation Rate in Nigeria

Pairwise Granger Causality Tests			
Date: 11/28/18 Time: 06:55			
Sample: 1990 2016			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
OILEX does not Granger Cause LFDI	25	1.22267	0.3155
LFDI does not Granger Cause OILEX		4.01912	0.0341
EXCHRATE does not Granger Cause LFDI	25	1.66026	0.2152
LFDI does not Granger Cause EXCHRATE		1.44893	0.2584
INFL does not Granger Cause LFDI	25	2.33918	0.1222
LFDI does not Granger Cause INFL		1.52683	0.2415
EXCHRATE does not Granger Cause OILEX	25	2.45403	0.1114
OILEX does not Granger Cause EXCHRATE		2.92121	0.0571
INFL does not Granger Cause OILEX	25	0.16228	0.8513
OILEX does not Granger Cause INFL		1.31388	0.2910
INFL does not Granger Cause EXCHRATE	25	1.14488	0.3383
EXCHRATE does not Granger Cause INFL		1.74056	0.2010

Source: Authors' Computation (2018)

In table-5, attempt has been made to examine the causal relationship among FDI, oil exports, exchange rate and inflation rate with the aid of Pairwise Granger Causality Test. The results presented in the table show that of unidirectional causality which runs from FDI inflows to oil exports in Nigeria. This shows that inflows of foreign capital

is motivating factor behind oil exports in the country. In the same vein, a unidirectional feedback flows from oil exports to exchange rate. This implies that the current behavior of exchange rate in the country can be linked to the overdependence of the country's foreign earnings on oil exports alone. However, there is no causal relationship between FDI and exchange rate in one hand and exchange rate and inflation rate on the other hand.

#### CONCLUSION AND RECOMMENDATIONS

The study examines the relationship between FDI inflows and oil exports in Nigeria over the period of 1990 to 2016. The summary of the findings that emerged in this study are as follows; FDI has a significant positive impact on oil exports in Nigeria. This confirms that the majority of foreign capital goes to oil and gas sector in this country. However, FDI and exchange rate have a significant negative relationship in the country. It could be inferred that exchange rate situation has not been favourable to FDI inflows in the country.

Furthermore, there is an existence of unidirectional causality which runs from FDI inflows to oil exports in Nigeria. The inflows of foreign capital is motivating factor behind oil exports in the country. Also, a unidirectional feedback flows from oil exports to exchange rate. This implies that the current behavior of exchange rate in the country can be linked to the overdependence of the country's foreign earnings on oil exports alone. However, there is no causal relationship between FDI and exchange rate in one hand and exchange rate and inflation rate on the other hand.

Finally, the following recommendation could be made based on the findings in this study. The policy makers in Nigeria should see foreign capital as the backbone behind the oil exports in the country. However, the proceeds from oil exports should be diversified and invested in the non-oil sector of the economy in order to stimulate a fovourable exchange rate which can serve as catalyst that can facilitate further inflows of FDI in the country.

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