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Analysis of Foreign Direct Investment (FDI) on The Nigerian Economy 1985 – 2017: A Vector error correction Model Approach.

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Abstract

This research work examined the impact of foreign direct investment on economic growth in Nigeria: A VAR model analysis (1985 – 2017). Secondary time series data obtained from World Bank were made to undergo series of tests to investigate the impact of foreign direct investment on economic growth in Nigeria covering a period of 33 years. The variables used are foreign direct investment, economic growth, exchange rate, interest rate and oil price. The stationarity test (unit root) showed that the included variables; economic growth (ECGT), exchange rate (EXCHR), interest rate (INTR) and oil price (OILP) were stationary at their level except for foreign direct investment (FDI) and exchange rate (EXCH) which was stationary after the first difference. They were thus integrated of order one 1(1). The Cointegration test using Johansen Cointegration test revealed that the variables were cointegrated and had a stable relationship in the long-run. To check for short-run relationship, the Granger causality test was adopted, and it showed causality relationship among the variables. As the result suggests, it becomes beneficial for Nigeria to attract FDI in order to stimulate the economic growth rate. The study recommended that there is need to improve the FDIs climate to take advantage of the new global interest in the affairs of the country by implementing sound macroeconomic policies, spurring innovation, improving the investment climate, establishing a transparent legal framework that does not discriminate between local and foreign investors and improving the provision of infrastructure and the government should implement policies that will make the foreign investment on oil sector more efficient and re-position it for economic growth in Nigeria.

Keywords: *FDI, oil price, GDP grow, VAR analysis, Nigeria*

Introduction

Domestic and local production are necessary for economic growth of any country, foreign direct investment (FDI) has much important and crucial role in economic development of any country as it considered as major catalyst for economic development and growth. The investments made by individuals or firms into any country's economy for managerial perspective and interest for establish new business or extend existing business's operations into same or any host country considered as foreign direct investment (Adelegan, 2000, World bank 2014). FDI plays vital and crucial role in assessing and tapping new markets for investments by using latest technologies as opportunities rises in any market around the globe (Ayanwale, 2012). The foreign direct investments provide opportunities for new business establishment and creates lot of employment opportunities, improvement in existing businesses by enabling efficiencies and contribute for quality human capital in host countries.

World Bank (2022), FDI investment observed at inclined significantly from US$542m to

1.9 billion US$ during 1981 to 1989 and to 2.39 billion US$ in 2022.The Nigeria considerably important country with potential to become largest economy in region and the fact has been acknowledged by global economic players due to highly skilled employees and workforce and other materialistic resources. The huge reserves of human capital and natural resources contribute towards Nigeria's distinguished position among region, and possess the potential for emerging and stable economy, reduction in poverty, providing best services for health, educational facilities and importantly infrastructural services towards its huge population to fulfill their needs. However, the achievement of above stated intentions were never met due to shrink in size of productive sectors as largely dependence on oil. The natural resources base in Nigeria has considered as large market potential which fulfills the demand for attracting large amount of FDI and stood among top three African countries as most attractive destination for FDI in past decade (Sabiu*et al*, 2014).

The government of Nigeria has taken various efforts at encouraging and improving economic development by brining and attracting foreign direct investment, but that has not yielded much result. The size and speed of FDI found to be fluctuates during different economic periods, particularly during the period of recession where trade size dropped and the interest level in highly competitive international markets found to be affected adversely and effect external gratitude for under developed countries. The literature has depicted that worst management and bad economic managerial moves negatively affect capital income and increased fallen domestic savings negatively influenced the FDI performance (Esther, 2010). Various other research scholars depicted that countries strive and put their energies to encourage foreign direct investment to boost economy. On the other hand investors hesitate to enter Nigeria due to various reasons and problems which include poor infrastructural facilities, corruption at higher level, insecurity for investment and other resources, violence and indiscipline among stock exchange markets (Olokoye, 2012).

Ahmed *et al.* (2013). conducted study on FDI size and impact on Nigerian economy for boosting capital inflow, reduce unemployment and increase employment opportunities, technological advancement adoption for country, it has the ability of shifting profit and tax in other cross border territories through appropriate transfer patterns

Sabiu,*et al.* (2014) conducted study on Nigeria, the study found that FDI impact on GDP growth of country on long-term basis and establish long term relation between FDI and economic growth. The inclusion of foreign direct investment in any country influences the economic development and growth, further it contributes for reducing unemployment and to stabilize economic situations.

Several policies have been initiated and adopted by government for attracting foreign investors to take advantage of globalization, specifically, government has taken the decision to implement IMF monitored liberalization for its economy to welcome foreign affairs for manufacturing and production sector, various incentives have been introduced for various business sectors to take ownership of equity among all industries but with restricting few sectors such as military equipment, energy sector such as gas and oil, iron industry and steel sector.

Government adjusts various reforms to attract business activities and investment for their business sector, these incentives includes various tax reliefs, availability of cheap and quality raw material and tax relaxation. The economic reforms have taken place long time ago since 80s related to privatization options, promotions on investment in specific sectors, structural changes and expert zones during 80s and 90s. The reports found that these efforts of government failed to stimulate FDI and caused low pace for social development, poor infrastructural issues and technology transfer, huge unemployment, indebtedness and finally failure in gross domestic product incline.

However, there is lot more remaining to know about foreign direct investment and its role on Economic development in Nigerian region and research needs to be conducted on impact of foreign direct investment for economic growth. Therefore, this research was conducted to analyzed the impact of FDI on economy of Nigeria and suggest policies for attracting Investments andto boost economic growth.

Methodology

This study adopted the case study approach to provide the deep understanding of problem and address the more specific issues related to the problems faced by countries in order to maintain the appropriate utilization of FDI for economic growth. In this case, Nigeria is chosen. In the method of data analysis, Granger-Causality Test, Unit Root Test, Variance Decomposition, Impulse Response test and Regression analysis were used to investigate the relationship between FDI and economic growth of Nigerian economy. Also, the linear relationship of the dependent and independent variables is tested to show if they are significant or not.

The present study entails the secondary data for analysis. The data for FDI, economic growth, exchange rate, interest rate and oil price were fetched from the documents published by World Bank development indicators in Developing Countries. Inferential statistic method was used to investigate the impact of FDI on economic growth, exchange rate, interest rate and oil price respectively. Analysis using E-Views 9.0 was done to see how FDI impacts on the Nigerian economy. Data can be divided into two types, namely: Primary data and Secondary data. Primary data are sourced from the field directly that is, one-on-on interviews and interactions, while secondary data are sourced from publications or organizations that have acquired and stored them.

Model Specification

The model used in this study is adapted from Alfaro *et al* (2003), they wrote on "Foreign Direct

In modifying the equation 1, the researcher introduced log in the equation to improve the linearity of the equation (1) to suit the studies objectives and also used FDI as the dependent variable.

$$In\text{-}FDI_t = a_0 + a_1 In\text{-}ECGT_t + a_2 In\text{-}EXCHR_t + a_3 In\text{-}INTR + a_4 In\text{-}OILP_t + V_t \quad (2)$$

Where,

FDI = Foreign Direct Investment

ECGT = Economic Growth

EXCHR = Exchange Rate

INTR = Interest Rate

OILP = Oil price

a_0 = Intercept

a_1– a_3 = Other parameters to be estimated. They are impacts of each of the independent variables on the dependent variable.

V_t is error term. Mathematically, a vector autoregressive model (VAR) model of lag order 1 can be written as thus:

$$Y_x = a_{10} + a_2 y_{t-11} + a_3 x_{t-12} + e_{1t} \quad (3)$$

$$X_t = a_{20} + a_{21} y_{t-1} + a_{22} x_{t-1} + e_{2t} \quad (4)$$

The main objective of vector autoregressive (VAR) model in this study is to come up with examination and assessment of relationship type between FDI and development of economy and to know if there is any significant impact from the shocks. This is when the variance decomposition comes in.

Furthermore, we will need to state equation (2) in VAR form, hence we have;

$$ECGT_{t,1} = a_1 + \Phi_{11} FDI_{t-1,1} + \Phi_{12} EXCHR_{t-1,2} + \Phi_{13} INTR_{t-1,3} + \Phi_{14} OILP_{t-1,4} + V_{t,1} \quad (5)$$

Investment and Economic Growth in Nigeria". Here is the original model of

Alejandro,(2016)

$$GDP = \beta_0 + \beta_1 FDI + \beta_2 GCE + \beta_3 EXR + \beta_4 IR + U \quad (1)$$

$$INTR_{t,4} = a_4 + \Phi_{41} ECGT_{t-1,1} + \Phi_{42} FDI_{t-1,2} + \Phi_{43} EXCHR_{t-1,3} + \Phi_{44} OILP_{t-1,4} + V_{t,4} \quad (8)$$

$$OILP_{t,5} = a_5 + \Phi_{51} ECGT_{t-1,1} + \Phi_{52} FDI_{t-1,2} + \Phi_{53} EXCH_{t-1,3} + \Phi_{54} INTR_{t-1,4} + V_{t,5} \quad (9)$$

Hence, the four equations above are vector autoregressive model of order 1, denoted as VAR (1). Each variable is a linear function of lag 1 values for all variables in the set.

Data Analysis Techniques

The data for this study was taken from World Bank under specific time series for investigation the influence and impact of FDI on the economy of Nigeria. Thus, the present study is quantitative in nature and developed on the base of previous research design and methodologies to conduct the present research. The Statistical techniques used are Augmented Dickey-Fuller Unit root test (Dickey and Fuller, 1981in: Calvo*et al*) used to test for the stationarity of the variables. Pairwise Granger-causality tests were conducted to see if there was one-way causality, dual causality or no causality among the variables.

$$FDI_{t,2} = a_2 + \Phi_{21} ECGT_{t-1,1} + \Phi_{22} EXCHR_{t-1,2} + \Phi_{23} INTR_{t-1,3} + \Phi_{24} OILP_{t-1,4} + V_{t,2} \quad (6)$$

$$EXCHR_{t,3} = a_3 + \Phi_{31} ECGT_{t-1,1} + \Phi_{32} FDI_{t-1,2} + \Phi_{33} INTR_{t-1,3} + \Phi_{34} OILP_{t-1,4} + V_{t,3} \quad (7)$$

Co-integration test suggests that there is long-run or equilibrium relationship among variables despite their non-stationarity.

Variance decomposition is obtained from a VAR model; it is used to identify the contribution of each independent variable in explaining variations of the dependent variable in the model. For the data analysis in this research work, a VAR model to capture the linear interdependencies among the variables (FDI, ECGT, EXCHR, INTR and OILP). The utilization of these models assist in avoiding various issues and challenges to crop up, on the other hand qualitative studies are suitable for utilization in econometric research designs. These challenges included the subjective issues and biased responses and challenges to incorporation of this biasness in econometric models. All of these tests were done using E-views 9.0.

Variable Measurement

The study examined the relationship between foreign direct investments on economic growth in Nigeria and the measurement for the variables are hereby presented as thus:

Table 1: Variables Measurement

S/No.	Dependent variable	Measurement	Sources
	FDI	Foreign Direct Investment is measured in Million and Billion ($)	Worldbank development indicator (WDI)
	Independent Variables		
1.	ECGT	Economic Growth is measured in (USD)	Worldbank development indicator (WDI)
2.	EXCHR	Exchange Rate is measured in (USD)	Worldbank development indicator (WDI)
3.	INTR	Interest Rate is measured in (USD)	Worldbank development indicator (WDI)
4.	OILP	Oil price is measured in (USD)	Worldbank development indicator (WDI)

Source: *Author's Compilation, 2019.*

Result and Discussions

The time series data FDI (Foreign Direct Investment), ECGT (Economic Growth), EXCH (Exchange Rate), INTR (Interest Rate) and OILP (OIL PRICE) were put through the process of stationarity tests using the Augmented Dickey Fuller (ADF) test. All of them (EXCHR, INTR and OILP) were stationary at levels except for EXCH and FDI which was stationary after the first difference. ECGT has a prob. Value of 0.0052 while FDI, EXCHR, INTR and OILP have prob. Value of 0.0000, 0.0381, 0.0001 and0.0560respectively. Considering the critical values and ADF statistics all the variables were stationarity at 1%, except EXCHR which was stationary at 5%.

Unit Root (Stationarity) Test

Table 2: Unit Root Test Results (Using Augmented Dickey-Fuller Method)

TIME SERIES	ADF STATISTICS	CRITICAL VALUE	STATIONARY STATUS	PROBABILITY
FDI	-7.513640	-4.296729 (1%) -3.568379 (5%) -3.218582 (10%)	1(1)	0.0000

		-4.284580 (1%)		0.0052
ECGT	-4.559330	-3.562882 (5%)	1(0)	
		-3.215267 (10%)		
		-4.296729 (1%)		0.0381
EXCHR	-3.697738	-3.568379 (5%)	1(1)	
		-3.215267 (10%)		
		-4.284580 (1%)		
INTR	-6.120813	-3.562882 (5%)	1(0)	0.0001
		-3.215267 (10%)		
OILP	-2.913874	-3.67322 (1%)		
		-2.967767 (5%)	1(0)	0.0560
		-2.622989 (10%)		

Source: *Author's Computation Using E-View 9.0 version.*

Co-Integration Test Using Johansen

The study based on time series data so that various time series were integrated at level except for FDI of the first order, the second step in testing the relationship between FDI, ECGT, EXCHR, INTR and OILP is to test for the co-integration relationship between the variables, in order to determine if there is a long-run relationship between the variables. The test for the long-run relationship between both variables was done using Johansen co-integration test.

The appendix (vi) of the study demonstrated the output reports of research, the results of co-integration, and the table depicted best results by showing two co-integrating equation at 1% and 5% level of significance. This depicts that there is long term relationship exists between the constructs of the study. So that, it is believed that the long run steady state relationships among different variables found including FDI, EXCHR, ECGT, INTR and OILP in Nigerian context. After the establishment of the relationship of co-integration among variables of the study, it is concluded long term relationship has been identified between them even in non-stationary state. Further, the trace statistics or ratios are higher than critical values, so it can be concluded that co-integration exists.

Table 3: Granger-Causality Test Result

Null Hypothesis:	Obs	F-Statistic	Prob.
ECGT does not Granger Cause FDI	31	0.62957	0.5407
FDI does not Granger Cause ECGT		9.76312	0.0007
EXCH does not Granger Cause FDI	27	2.81830	0.0813
FDI does not Granger Cause EXCH		0.06737	0.9350
INTR does not Granger Cause FDI	31	0.42570	0.6578
FDI does not Granger Cause INTR		0.97518	0.3905
OILP does not Granger Cause FDI	28	0.42566	0.6584
FDI does not Granger Cause OILP		3.03402	0.0677
EXCH does not Granger Cause ECGT	27	4.82618	0.0183
ECGT does not Granger Cause EXCH		0.04117	0.9597
INTR does not Granger Cause ECGT	31	0.33465	0.7186
ECGT does not Granger Cause INTR		3.06163	0.0640
OILP does not Granger Cause ECGT	28	0.41637	0.6643
ECGT does not Granger Cause OILP		3.65143	0.0420
INTR does not Granger Cause EXCH	27	3.71595	0.0407
EXCH does not Granger Cause INTR		1.39890	0.2680
OILP does not Granger Cause EXCH	27	0.75635	0.4812
EXCH does not Granger Cause OILP		1.48575	0.2482
OILP does not Granger Cause INTR	28	4.83330	0.0177
INTR does not Granger Cause OILP		1.13586	0.3385

Pairwise Granger Causality Tests
Date: 07/15/19 Time: 04:49

Source: *Author's Computation Using E-View 9.0 version.*

FDI does not granger causes ECGT with prob. Value 0.0007 is significant at 1% and should be rejected and accept the alternative hypothesis. Thus, this means that FDI actually granger causes ECGT. Foreign direct investment causes change in economic growth. Furthermore, EXCHR does not granger causes FDI. This was found to be statistically significant at 10% with p-value of 0.0813 and should be accepted. Thus, exchange rate causes changes in foreign direct investment.

FDI does not granger causes OILP. This was found to be statistically significant at 10% with p-value of 0.0672 and should be accepted. Thus, foreign direct investment causes changes in oil price. Furthermore, EXCHR does not granger causes ECGT. This was found to be statistically significant at 5% with p-value of 0.0183 and should be accepted. Thus, exchange rate causes changes in economic growth.

ECGT does not granger causes INTR. This was found to be statistically significant at 10% with p-value of 0.0640 and should be accepted. Thus, economic growth causes changes in interest rate. Furthermore, ECGT does not granger causes OILP. This was found to be statistically significant at less than 5% with p-value of 0.0420 and should be rejected and accept the alternative hypothesis. Thus, economic growth causes changes in oil price.

INTR does not granger causes EXCH. This was found to be statistically significant at less than 5% with p-value of 0.0407 and should be rejected and accept the alternative hypothesis. Thus, interest rate causes changes in exchange rate. Lastly, OILP does not granger causes INTR. This was found to be statistically significant at less than 5% with p-value of 0.0177 and should be rejected and accept the alternative. Thus, oil price causes changes in interest rate.

Vector Auto regression (VAR)

Var estimates are simply OLS estimates and when interpreting it we give it just the ceteris paribus interpretation we give to any OLS result. Using the regression table, the past realization of FDI is associated with 39.07% increase in FDI on average all things being equal (ceteris paribus). A percentage increase in economic growth (ECGT) account for 2.08% increase in FDI on average all things being equal (ceteris paribus). The past realization of EXCH associated with 37.49% increase in EXCH on average all things being equal (ceteris paribus). The past realization of INTR associated with 22.72% increase in INTR on average all things being equal (ceteris paribus). A percentage increase in oil price (OILP) account for -2.80% decrease in FDI on average all things being equal (ceteris paribus).

Table 4: Vector Auto regression Result

	FDI	ECGT	EXCH	INTR	OILP
FDI(-1)	0.390760	-4.532017	6.78E-09	1.14E-09	1.58E-11
	(0.34067)	(6.13876)	(3.5E-09)	(2.8E-09)	(1.5E-09)
	[1.14704]	[-0.73826]	[1.96196]	[0.40142]	[0.01082]
FDI(-2)	0.284942	0.055780	1.07E-10	1.91E-10	4.72E-11
	(0.33948)	(6.11732)	(3.4E-09)	(2.8E-09)	(1.5E-09)
	[0.83935]	[0.00912]	[0.03103]	[0.06726]	[0.03247]
ECGT(-1)	0.020826	0.698216	-2.76E-11	9.25E-11	-4.92E-11
	(0.01408)	(0.25374)	(1.4E-10)	(1.2E-10)	(6.0E-11)
	[1.47897]	[2.75170]	[-0.19292]	[0.78736]	[-0.81599]
ECGT(-2)	-0.021840	0.431901	-1.68E-10	-1.29E-10	2.45E-11
	(0.01583)	(0.28520)	(1.6E-10)	(1.3E-10)	(6.8E-11)
	[-1.37993]	[1.51440]	[-1.04653]	[-0.97534]	[0.36206]
EXCH(-1)	3466346.	3.62E+08	0.374956	-0.178878	-0.069291
	(2.4E+07)	(4.3E+08)	(0.24022)	(0.19760)	(0.10137)
	[0.14637]	[0.84769]	[1.56086]	[-0.90523]	[-0.68355]
EXCH(-2)	6108541.	97355500	0.431038	0.134071	0.077187
	(2.3E+07)	(4.2E+08)	(0.23661)	(0.19463)	(0.09984)
	[0.26189]	[0.23163]	[1.82173]	[0.68885]	[0.77308]
INTR(-1)	-5387290.	-50613665	1.227200	0.498308	0.001857
	(3.7E+07)	(6.6E+08)	(0.37361)	(0.30732)	(0.15765)
	[-0.14627]	[-0.07626]	[3.28472]	[1.62144]	[0.01178]
INTR(-2)	6425561.	-9.68E+08	0.970426	0.277338	0.060891
	(3.7E+07)	(6.7E+08)	(0.37717)	(0.31026)	(0.15916)
	[0.17281]	[-1.44493]	[2.57289]	[0.89390]	[0.38258]
OILP(-1)	49365175	-2.07E+08	-2.899154	-0.535561	0.317022
	(8.5E+07)	(1.5E+09)	(0.86099)	(0.70823)	(0.36332)

Vector Auto regression Estimates Date: 07/15/19 Time: 04:58; Sample (adjusted): 1987 2013
Included observations: 27 after adjustments; Standard errors in ( ) & t-statistics in [ ]
Source: Author's Computation Using E-View 9.0 version.

Conclusion And Recommendations

Foreign direct investment bring benefits to the economy of nations specifically among developing countries, various scholars have analyzed the relationship between FDI and economic circumstance and economic stability. The study intended to examine the relationship between foreign direct investment and economic growth of Nigeria, with presence of macro-economic variables.

The results of the study presented and came up with long term relationship existence among variables including direction of FDI flow and economic growth of the nation. The results show that growth has been observed on the base of foreign direct investment and cash inflow as result of private investments. Again, from our hypotheses and research questions in chapter one, its shows that foreign direct investment (FDI) has impact on economic growth of the Nigerian economy.

The policies must be formulated and consider the macro-economic indicators for attracting huge FDI towards the industrial revolution to maximize the benefits for Nigerian economy. Establishment of new agencies, improvement in local regulations are needed to be incorporate, development of financial markets are required and there is need to establish transparent policies. A strong legal system must be incorporated for attractive FDI investment by protecting their investments through strong and transparent legal system.

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