

**DETERMINANTS OF FOREIGN DIRECT INVESTMENT AND ITS CAUSAL EFFECT
ON ECONOMIC GROWTH IN NIGERIA**

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Abstract

Foreign direct investment (FDI) is an important tool for the growth of any economy as it is more stable than several forms of capital flows. The consensus is that it provides the much needed requirement for economic development and growth. However, evidences in Nigeria have shown FDI crowding out domestic firms and possible contraction of the economy thereby affecting industries and employment. Hence, this study primarily examined the determinants of FDI and its causal effect on the economic growth of Nigeria. The study specifically examined the effect of macroeconomic variables as the determinants of FDI in Nigeria as well as examined the causal effect of FDI on economic growth in Nigeria. In line with the objectives set to be achieved, the study used co-integration test and vector error correction model on the time series data collected from 1984 to 2015. The study revealed that foreign direct investment is negatively related to economic growth, export, inflation and interest rate while foreign direct investment is positively related to exchange rate and import. All these variables were statistically significant in determining FDI in Nigeria. The study concluded that FDI has a positive impact on the growth of Nigerian economy. Hence, it is recommended that government of Nigeria should promote import liberalisation through the reduction of tariffs; reduce the importation of consumable and intermediate goods and encourage the local industries to produce such goods.

Keywords: Foreign direct investment, economic growth, Nigeria

INTRODUCTION

One of the salient features of globalization drive is conscious encouragement of cross-border investments, especially by transactional corporations and firms (TNCs). Foreign direct investment (FDI) is an important tool for the growth of any economy as it is more stable than several forms of capital flows. It provides the needed capital for investment, increases competition in the host country industries, and aids local firms to become more productive by adopting more efficient technologies or by investing in human and/or physical capital (Ajayi, 2006). Developed countries view attraction of foreign direct investment (FDI) as a strategy for economic development. This may be because FDI is often regarded as an amalgamation of capital, technology, marketing and management.

According to Ajayi (2006), three main conduits through which FDI can bring about economic growth are augmenting domestic savings in the process of capital accumulation; main channel through which technology spillovers can increase factor productivity and efficiency in the utilization of resources leading to growth; and leading to increase in exports as a result of increased capacity and competitiveness in domestic production. This linkage is often said to depend on another factor, called “absorptive capacity”, which includes the level of human capital development, type of trade regimes and degree of openness (Borensztein, Gregorio and Lee, 1998). According to Loungari & Razin (2001), FDI has not only avoided creating an overhang of debts, but it has also facilitated the transfer of technology and managerial skills and hence, it can be directly tied to productive investment of a country.

Lall (2002) opined that FDI inflow affects many factors in the economy and these factors in turn affect economic growth. Available evidences revealed that developed countries seem to support the idea that the productivity of domestic firms is positively related to the presence of foreign firms (Globeram, 1979; Imbriani & Reganeti, 1997). However, the results for developing countries (such as Nigeria) are, not so clear, with some finding negative spillovers and others such as Aitken, Hansen and Harrison (1997) reporting limited evidence. Before the 1970s, FDI was seen as a secondary tool of economic growth and development in Nigeria. It is presently perceived as parasitic and capable of retarding the development of domestic industries for export promotion (Egwaikhide, 2012).

Macroeconomic variables such as inflation rate, exchange rate, money supply, etc. influence the changes in FDI of a nation. In addition, the level of import also influences its variation. Cobham (2001) observed the crowding out of domestic firms and possible contraction in the total industry and or employment. Although crowding out is a rare event, yet the benefit of FDI in export promotion remains controversial and depends crucially on the motive for such investment (World Bank, 1998). This would be by limiting downstream producers to low value intermediate products, and in some cases “crowding out” local producers to eliminate competition.

In addition, it may also limit exports to competitors and confine production to the needs of the transnational companies. These may also lead to a decline in the overall growth rate of the host country and worsen balance of payment situation (Blomstrom & Kokko, 1998). These

arguments have necessitated a critical look at what actually determine FDI and the causal relationship between FDI and economic growth in Nigeria. Specifically, this study examined the effect of macroeconomic variables as the determinants of FDI in Nigeria as well as examined the causal effect of foreign direct investment on economic growth in Nigeria. However, the hypotheses formulated to guide the study are stated in null form as follows:

H₀₁: Macro-economic variables do not significantly determine FDI in Nigeria.

H₀₂: There is no causal relationship between foreign direct investment and economic growth in Nigeria.

The next section is literature review. This is followed by methodology and discussions of findings. The last section covers the conclusion and recommendations of the study.

LITERATURE REVIEW

Theoretical Framework

This study relies on neoclassical economic theory of FDI. The theory propounds that FDI contributes positively to the economic development of the host country and increases the level of social wellbeing (Bergten, Horst and Moran, 1978). The reason behind this assertion is that the foreign investors usually bring capital into the host country, thereby influencing the quality and quantity of capital formation in the host country. The inflow of capital and reinvestment of profits increases the total savings of the country. Government revenue increases via tax and other payments (Seid, 2002). Moreover, the infusion of foreign capital in the host country reduces the balance of payments pressures of the host country.

Another statement favouring the neoclassical theory is that FDI replaces the inferior production technology in developing countries by a superior one from advanced industrialized countries through the transfer of technology, managerial and marketing skills, market information, organizational experience, and the training of workers. The multinational corporations (MNCs) through their foreign affiliates can serve as primary channel for the transfer of technology from developed to developing countries. The welfare gain of adopting new technologies for developing countries depends on the extent to which these innovations are diffused locally.

The proponents of neoclassical theory further argued that FDI raises competition in an industry with a likely improvement in productivity (Bureau of Industry Economics, 1995). Rise in competition can lead to reallocation of resources to more productive activities, efficient utilization of capital and removal of poor management practices. FDI can also widen the market for host producers by linking the industry of host country more closely to the world markets, which leads to even greater competition and opportunity to technology transfer. It is also argued that FDI generates employment, influences incomes distribution and generates foreign exchange, thereby easing balance of payments constraints of the host country (Sornarajah, 1994; Bergten, *et al.*, 1978). Furthermore, infrastructure facilities would be built and upgraded by foreign investors. The facilities would be the general benefit of the economy. The guidelines on the treatment of foreign direct investment incorporates the neoclassical theory when it recognizes that a greater

flow of direct investment brings substantial benefits to bear on the world economy and on the economies of the developing countries in particular, in terms of improving the long-term efficiency of the host country through greater competition, transfer of capital, technology and managerial skills and enhancement of market access and in terms of the expansion of international trade. Kennedy (1992) noted that host countries became more confident in their abilities to gain greater economic benefits from FDI without resorting to nationalization, as the administrative, technical and managerial capabilities of the host countries increased.

Empirical Review

Bende-Nabende *et al.*, (2002) found that direct long term impact of FDI on output is significant and positive for comparatively economically less advanced Philippines and Thailand but negative in the more economically advanced Japan and Taiwan. Hence, the level of economic development may not be the enabling factor in the FDI growth nexus. On the one hand, the endogenous school of thought opines that FDI also influences long run variables such as research and development (R&D) and human capital (Romer, 1986; Lucas, 1988).

Uwatt (2002) analyzed the relationship between FDI, growth and domestic investment for a sample of 107 developing countries for the 1980-1999 periods. His model uses flow of output as the dependent variable and domestic and foreign owned capital stock, labor, human skills capital stock and total factor productivity as their independent variables. The result obtained showed that panel data estimations in a production function framework suggest a positive effect of FDI on growth and although FDI appears to crowd-out domestic investments in net terms, in general, some countries have had favourable effect of FDI on domestic investments in net terms suggesting a role for host country policies.

Foreign direct investment could be beneficial in the short term but not in the long term. Durham (2004), for example, failed to establish a positive relationship between FDI and growth, but instead suggested that the effects of FDI are contingent on the “absorptive capability” of host countries. Obwona (2001) noted in his study of the determinants of FDI and their impact on growth in Uganda. He observed that macro-economic, political stability and policy consistency are important parameters determining the flow of FDI into Uganda and that FDI affects growth positively but insignificantly.

Ekpo (1995) reported that the political regime, real income per capita, rate of inflation, world interest rate, credit rating and debt service explain the variance of FDI in Nigeria. For non-oil FDI, however, Nigeria’s credit rating is very important in drawing the needed foreign direct investment into the country. Vu & Noy (2009) carried out a sectoral analysis of FDI and growth in developed countries. They focused on the sector specific impacts of FDI on growth. They found that FDI has positive and no statistically discernible effects on economic growth through its interaction with labour. Moreover, they found that the effects seem to be very different across countries and economic sectors. Carkovic & Levine (2005) argued that the positive results found in the empirical literature are due to biased estimation methodology. When they employed a

different estimation technique i.e. Arellano-Bond Generalized Moment of Methods (GMM), they found no robust relationship between FDI inflows and domestic growth.

Lall (2002) opined that FDI inflow affects many factors in the economy and these factors in turn affect economic growth. This review shows that the debate on the impact of FDI on economic growth is far from being conclusive. The role of FDI seems to be country specific and can be positive, negative or insignificant, depending on the economic, institutional and technological conditions in the recipient countries. The relationship between FDI and growth is conditional on the macroeconomic dispensation the country in question is passing through. Akinlo (2004) investigated the impact of FDI on economic growth in Nigeria using data for the period 1970 to 2001. The error correction model (ECM) results of the author showed that both private capital and lagged foreign capital have small significant impact on export and economic growth. Adelegan (2000) explored the seemingly unrelated regression model to examine the impact of FDI on economic growth in Nigeria and found out that FDI is pro-consumption and pro-import and negatively related to gross domestic investment.

Mukolu, Otalu and Awosusi (2013) investigated the impact of FDI in Nigeria using error correction model (ECM). Their result showed that FDI has both long run and short run significant impacts on the growth of Nigeria economy. In addition, Oyatoye, Arogundade, Adebisi and Oluwakayode (2011) examined the possible impact and relationship between FDI and economic growth in Nigeria using data for the period 1987 to 2006. The ordinary least square (OLS) employed showed that there is a positive relationship between FDI and gross domestic product (GDP). The study made the proposition that there is endogeneity i.e., bi-directional relationship between FDI and economic growth in Nigeria. Single and simultaneous equation systems were employed to examine if there is any sort of feed-back relationship between FDI and economic growth in Nigeria. The results showed that FDI and economic growth are jointly determined in Nigeria and there is positive feedback from FDI to growth and from growth to FDI (Okon, Augustine and Chuku, 2012). Otepola (2002) examined the importance of FDI in Nigeria. The study empirically examined impact of FDI on growth. He concluded that DFI contributes significantly to growth especially through exports. The study recommends a mixture of practical government policies to attract FDI to the priority sectors of the economy.

From the studies reviewed, it is apparent that the role of FDI seems to be country specific and can be positive, negative or insignificant, depending on the economic, institutional and technological conditions in the recipient countries. Most studies on FDI and growth are cross-country evidences, while the role of FDI in economic growth can be country specific. The impact FDI has on the growth of any economy may be country and period specific and as such there is the need for country specific studies. This discovery from the literature is what provides the motivation for this study on impact of FDI on economic growth in Nigeria.

Research Gaps and Contributions to Knowledge

Academic interest in the topic of foreign direct investment and economic growth is evident by the level of attention it has received over the last few decades. Studies (such as Mukolu, Olatu and Awosusi (2013) were carried out to investigate the impact of FDI in Nigeria using error correction model (ECM). Other studies (such as Bende-Nabende *et al.*, 2002) examined the direct long term impact of FDI on output. However, this study uniquely examined the causal effect of FDI on economic growth. The study further examined the effect of macroeconomic variables as the determinants of FDI. In view of this, the study contributes to the existing body of knowledge by filling the identified gap.

METHODOLOGY

Model Specification

The model for this study is adapted from the work of Oloyede & Obamuyi (2000) which state in a simple equation that GDP is a function of FDI. In order to achieve reliable result, this model was adjusted by including variables such as interest rate, import, export, inflation, openness of trade and exchange rate. However two models were used to achieve the objectives of the study. Given the established relationship between FDI and economic growth (GDP), to examine the long-run relationship and short run dynamics between FDI and economic growth as well as other determinants of FDI; Vector Error Correction (VECM) was employed and the empirical model was specified as follow:

$$FDI_t = f(GDP, INF, OPN, EXR, IMP, INT, EXP) \quad (i)$$

$$GDP_t = f(FDI, INF, OPN, EXR, IMP, INT, EXP) \quad (ii)$$

Hence, to estimate the empirical model and conduct the Johansen co-integration test, we specify the VECM in matrix form as follows

$$\begin{pmatrix} \Delta FDI \\ \Delta EGR \\ \Delta EXR \\ \Delta IMP \\ \Delta INT \\ \Delta EXP \\ \Delta INF \\ \Delta OPN \end{pmatrix}_t = \begin{pmatrix} v_1 \\ v_2 \\ v_3 \\ v_4 \\ v_5 \\ v_6 \\ v_7 \\ v_8 \end{pmatrix} + (L) \begin{pmatrix} \varphi_{11} \varphi_{12} \varphi_{13} \varphi_{14} \varphi_{15} \varphi_{16} \varphi_{17} \\ \varphi_{21} \varphi_{22} \varphi_{23} \varphi_{24} \varphi_{25} \varphi_{26} \varphi_{27} \\ \varphi_{31} \varphi_{32} \varphi_{33} \varphi_{34} \varphi_{35} \varphi_{36} \varphi_{37} \\ \varphi_{41} \varphi_{42} \varphi_{43} \varphi_{44} \varphi_{45} \varphi_{46} \varphi_{47} \\ \varphi_{51} \varphi_{52} \varphi_{53} \varphi_{54} \varphi_{55} \varphi_{56} \varphi_{57} \\ \varphi_{61} \varphi_{62} \varphi_{63} \varphi_{64} \varphi_{65} \varphi_{66} \varphi_{67} \\ \varphi_{71} \varphi_{72} \varphi_{73} \varphi_{74} \varphi_{75} \varphi_{76} \varphi_{77} \\ \varphi_{81} \varphi_{82} \varphi_{83} \varphi_{84} \varphi_{85} \varphi_{86} \varphi_{87} \end{pmatrix} \begin{pmatrix} \Delta FDI \\ \Delta EGR \\ \Delta EXR \\ \Delta IMP \\ \Delta INT \\ \Delta EXP \\ \Delta INF \\ \Delta OPN \end{pmatrix}_t + \Pi \begin{pmatrix} \Delta FDI \\ \Delta EGR \\ \Delta EXR \\ \Delta IMP \\ \Delta INT \\ \Delta EXP \\ \Delta INF \\ \Delta OPN \end{pmatrix}_{t-1} + \begin{pmatrix} e_1 \\ e_2 \\ e_3 \\ e_4 \\ e_5 \\ e_6 \\ e_7 \\ e_8 \end{pmatrix}_t$$

Where:

$$\Pi = \sum_{j=1}^{j=p} \varphi_j - I_k \quad L = \text{the operator of lags}$$

Where:

Δ = Differencing sign

FDI = Foreign direct investment

EXG = Exchange rate

OPN = Openness of trade

EGR= Economic growth measured using compounded growth rate formula (difference of log Gross domestic product (GDP))

EXP= Export

INF = Inflation

INT = Interest rate

IMP = Import

μ_t =Error term

t = Time.

$\beta_0, \beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ and β_6 are the coefficients to be estimated

Secondary data obtained from the Central Bank of Nigeria Statistical Bulletin, Nigerian Stock Exchange Fact book and Securities and Exchange Commission database were employed in the study. The time series data cover a period of thirty (30) years from 1984 to 2015. Time series data are often non-stationary; hence stationarity was tested in order to avoid spurious regression. To achieve the objectives of this paper, unit root test, co-integration and VECM were the estimation techniques employed.

Description of Variables

Variables	Description
FDI	Foreign direct investment (FDI) is an investment made by a company or individual in one country in business interests in another country, in the form of either establishing business operations or acquiring business assets in the other country.
EG	Economic growth refers to sustained rise in the value of economic activities within a country over a period of time. The RGDP can be used to measure economic growth.
EXP	Export (EXP) is the total value of good that moved into a country.
Trade Openness	Trade openness is the removal or reduction of restrictions or barriers on the free exchange of goods between nations. This includes the removal or reduction of tariff obstacles, such as duties and surcharges, and nontariff obstacles, such as licensing rules, quotas and other requirements. Trade openness can also be called Trade liberalization. Trade openness is calculated as ratio of total value of imports plus the total value of exports
EXG	Exchange rate is the rate at which one currency are exchange for another or the conversion of one currency into another currency.
INF	Inflation rate (INF) is a measure of the average change over time in the prices paid

	by consumers for a market basket of consumer goods and services.
EXP	Export (EXP) is the total value of good that moved into a country.
IMP	This measures the total value of goods that moved out of a country.
INT	It is defined as the proportion of an amount loaned which a lender charges as interest to the borrower, normally expressed as an annual percentage. It is the rate a bank or other lender charges to borrow its money, or the rate a bank pays its savers for keeping money in an account.

PRESENTATION AND INTERPRETATION OF RESULTS

TABLE 1

Result of Unit Root Test

The unit root test is presented below:

Series	ADF	5% critical level	Philip Perron	5% critical level	Order of integration
GDP	-5.922513***	-3.580623	-5.994862***	-3.580623	I(1)
FDI	-7.752968***	-3.225334	-8.445455***	-3.225334	I(1)
EXP	-5.248833***	-3.587527	-7.243905***	-3.587527	I(1)
EXR	-5.000564***	-3.580623	-5.000204***	-3.580623	I(1)
IMP	-8.558614***	-3.580623	-13.43880***	-3.580623	I(1)
INT	-6.850030***	-2.971853	-7.036060***	-2.971853	I(1)

***denotes significance at 1%.

Source: Authors' Computation (2016)

The result above reveals that all the series are stationary at first difference which mean that they are integrated of order one, that is I(1). Using the series at levels will give spurious regression, which may make the results not to be reliable. However, as suggested by Engle and Granger (1989), there could be a form of long run relationship amongst variables in the model, even though they are first difference-stationary. This possibility informs the need to conduct the co-integration test, which is presented below.

TABLE 2
Result of Co-integration Test

Hypothesized no of CE(s)	Maximum Eigen statistics	Trace Statistics	5% critical value
None*	74.09081	180.3748	40.07757
At most 1 *	49.25694	106.2840	33.87687
At most 2 *	31.50617	57.02708	27.58434
At most 3 *	19.94552	25.52091	21.13162
At most 4	5.507955	5.575391	14.26460
At most 5	0.067436	0.067436	3.841466

Source: Authors' Computation (2016)

The result of the Johansen co-integration test presented in Table 2 was used to examine the existence or otherwise of long run relationship. The null hypothesis is that there is no co-integration. The study used trace statistics and the maximum Eigen statistics. The null hypothesis is rejected when the statistics are greater than the critical value. In this case, both the Trace statistics and maximum Eigen statistics indicate 3 integrating equation at 5% significant level. This implies that long run relationship exist among the variables. This led to the non- acceptance of the hypothesis of no co-integration. The co-integration results expressed in the table suggest the inapplicability of a Static Ordinary Least Square (SOLS) estimation technique and of course imply the possibility of using a Vector Error Correction Model (VECM).

TABLE 3
Pairwise Granger Causality Tests

Null Hypothesis:	Observations	F-Statistic	Prob.
FDI does not Granger Cause GDP	29	16.4068	0.0004
GDP does not Granger Cause FDI		13.4939	0.0011

Source: Authors' Computation (2016)

The result of the granger causality test presented in table 3 shows a bidirectional causality between FDI and GDP. The F-statistics of the two hypotheses (FDI does not Granger Cause GDP and GDP does not Granger Cause FDI) are 16.407 and 13.494 with P-values 0.0004 and 0.0011 respectively. This implies non-rejection of both hypotheses. Hence, FDI granger cause GDP and in turn GDP granger causes FDI. So, foreign direct investment promotes economic growth which in turns attracts foreign direct investment. Since there is bidirectional causality, the series are co-integrated, the use of Vector Error Correction Model (VECM) becomes imperative. VECM captures the co-integration for a system of equations. The result of the VECM is therefore presented in table 4.

TABLE 4
Result of vector error correction model estimation

Long run relationship (Cointegrating equation)								
Variables	LOG FDI(-1)	EGR(-1)	EXG(-1)	LOG(EXP(-1))	LOG(IMP(-1))	INF(-1)	INT(-1)	OPN(-1)
Coefficients	1.00	-0.49281	0.002038	-2.18378	0.732464	-0.0042	-0.0575	6.9905
Standard error		(-0.1244)	(-0.00034)	(0.04284)	(0.02090)	(0.001)	(0.005)	(0.271)
t-statistics		[-3.96153]	[5.99132]	[-50.9812]	[35.0492]	[7.514]	[12.55]	[25.81]
Short run dynamics (Error Correction)								
Variables	D(LOG(FDI))	D(ECOGROWTH)	D(EXG)	D(LOG(EXP01))	D(LOG(IMP))	D(INF)	D(INT)	D(OPN)
Coefficients	-1.4004	-0.217877	30.96882	-0.962984	-1.836191	-6.2288	3.9177	-0.1219
Standard error	(0.352)	(0.17834)	(14.4697)	(0.39133)	(0.42813)	(15.518)	(2.446)	(0.096)
t-statistics	[3.975]	[-1.22172]	[2.14026]	[-2.46077]	[-4.28882]	[-0.401]	[1.602]	[-1.276]
R-squared	0.8145	0.626955	0.447222	0.513048	0.797729	0.4189	0.5462	0.4786
Adj. R-squared	0.7164	0.429461	0.154574	0.255249	0.690644	0.1112	0.3059	0.2025

Source: Authors' Computation (2016)

The existence of long run relationship among the variables established by the cointegrating test enables us to find out the long run impact of the explanatory variables on the dependent variable with the use of VECM earlier specified. The result is reported in table 4. The result shows evidence of long run equilibrium impact. The long term variables that explain foreign direct investment (FDI) are EGR, EXR, EXP IMP, INF, INT and OPN. All the variables are shown to be statistically significant. This implies that in the long-run, all the variables influence the inflow and outflow of foreign direct investment in Nigeria.

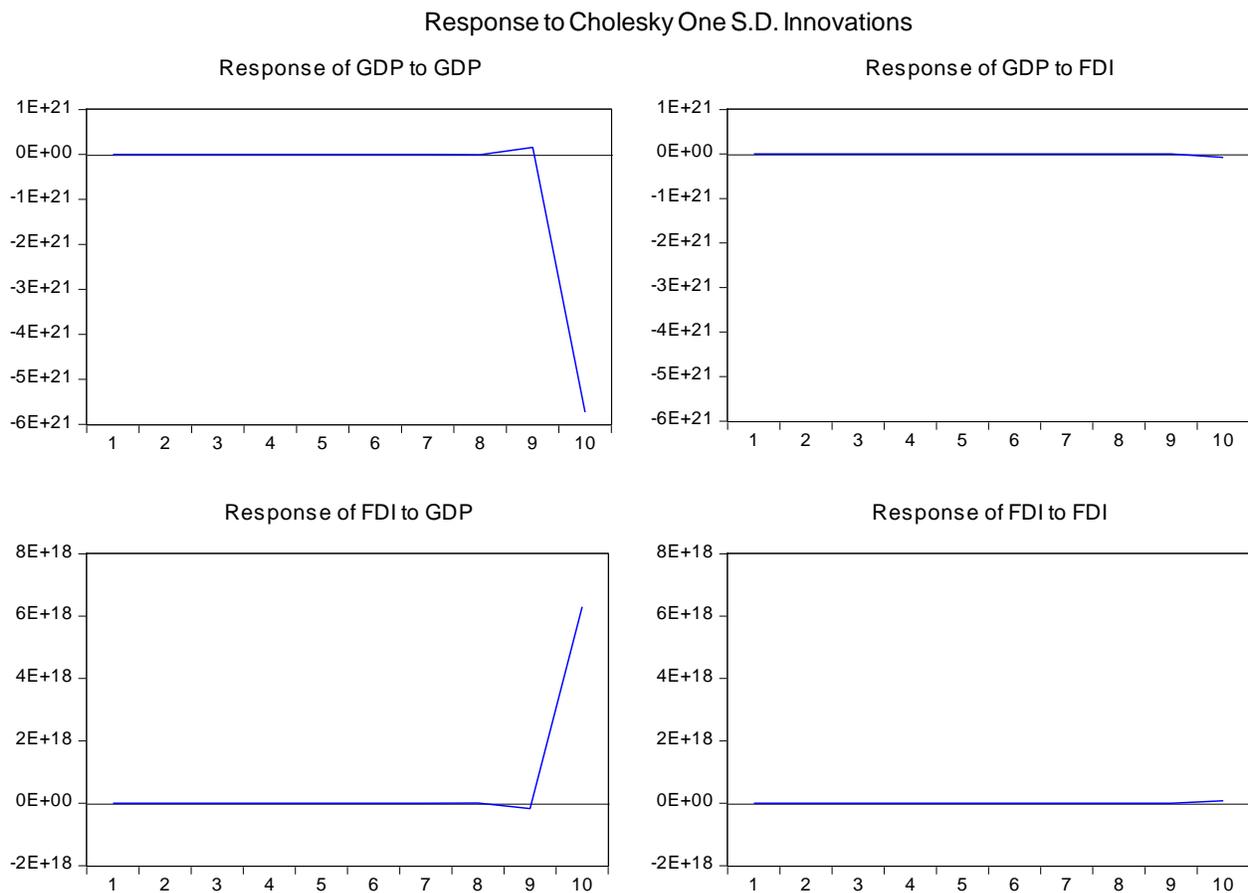
The result of the co-integrating equation shows that foreign direct investment (FDI) is negatively related to EGR, EXP, INF and INT while it is positively related to EXG, IMP and OPN. The coefficients which measure the extent of long run changes in FDI derived from the

changes in the independent variables are calculated as the product of the coefficient of integration with the speed coefficient of response (speed of adjustment). The calculated values are reported in the equation below.

$$FDI = 0.107EGR + 0.0619EXG + 2.103EXP + 1.345IMP + 0.026INF - 0.223INT - 0.853OPN$$

This shows that a percentage increase in EGR, EXG, IMP and INF will lead to 10.7%, 6.1%, 2.1%, 1.3% and 2.6% increases in FDI respectively. The speed of convergence to equilibrium is explained by the use of the error correction co-integration coefficients of the short run dynamics (see table 4). It shows that only EXG and INT found to have a positive short run impact on FDI.

FIGURE 1



Source: Authors' Computation (2016)

From the impulse responses graph above, it can be observed that when the impulse is from GDP, FDI response is zero, that is, it is indifferent, while when the impulse is from FDI, GDP responds

positively. Also, when the impulse is from GDP, subsequent GDP values respond negatively, while when the impulse is from FDI, subsequent FDI exhibits zero response.

Discussion of Findings

Vector error correction model was used to investigate the impact of foreign direct investment on the growth of Nigeria economy. The result of the co-integrating equation shows that foreign direct investment (FDI) is negatively related to EGR, EXP, INF and INT which is consistent with the study of Otepola (2002). It was also revealed that foreign direct investment is positively related with EXG, IMP and OPN while the study shows an evidence of long run equilibrium impact. The long term variables that explain foreign direct investment (FDI) are EGR, EXR, EXP IMP, INF, INT and OPN which are also consistent with Oyatoye, *et al.*, (2011) and Mukolu, *et al.*, (2013).

Finally, the study revealed that foreign direct investment promotes economic growth which in turns attracts foreign direct investment. This study is consistent with the study of Akinlo 2004; Okon, *et al.*, 2012 and Mukolu, *et al.*, 2013. Thus the study is in line with the neoclassical economic theory of FDI.

Conclusion and Recommendations

The study hereby reveals that macro-economic variables of exchange rate, export, import, inflation, interest rate and openness of trade are statistically significant in determining foreign direct investment. Hence, the study concludes that FDI has a positive impact on the growth of Nigerian economy which in turn impacts on foreign direct investment. In the light of the above conclusion, the study recommends that Nigeria government should involve in export led economy and put in measures to reduce imports in order to attract more foreign direct investments that would trigger economic growth. The government of Nigeria should adjust the macro-economic variables in order to encourage the nation's economy to openness of trade so as to attract more foreign direct investments.

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APPENDIX

Vector Error Correction Estimates							
Date: 27/10/16 Time: 10:56							
Sample (adjusted): 1987 2015							
Included observations: after adjustments							
Standard errors in () & t-statistics in []							
Cointegrating Eq:	CointEq1						
LOG(FDI(-1))	1.000000						
EGR(-1)	-0.492807						

	(0.12440)							
	[-3.96153]							
EXG(-1)	0.002038							
	(0.00034)							
	[5.99132]							
LOG(EXP(-1))	-2.183781							
	(0.04284)							
	[-50.9812]							
LOG(IMP(-1))	0.732464							
	(0.02090)							
	[35.0492]							
INF(-1)	-0.004168							
	(0.00055)							
	[-7.51345]							
INT(-1)	-0.057523							
	(0.00458)							
	[-12.5560]							
OPN(-1)	6.990544							
	(0.27086)							
	[25.8086]							
C	6.270197							
Error Correction:	D(LOG(FDI))	D(ECOGROWTH)	D(EXG)	D(LOG(EXP01))	D(LOG(IMP))	D(INF)	D(INT)	D(OPN)
CointEq1	-1.400397	-0.217877	30.96882	-0.962984	-1.836191	-6.228752	3.917678	-0.121947
	(0.35233)	(0.17834)	(14.4697)	(0.39133)	(0.42813)	(15.5184)	(2.44625)	(0.09557)
	[-3.97463]	[-1.22172]	[2.14026]	[-2.46077]	[-4.28882]	[-0.40138]	[1.60150]	[-1.27597]
D(LOG(FDI(-1)))	-0.049142	0.106541	-19.76196	0.471286	0.930660	-8.067281	-1.319949	0.029965
	(0.22677)	(0.11478)	(9.313)	(0.25187)	(0.27556)	(9.988)	(1.574)	(0.061)

			12)			14)	48)	51)
			[- 2.1219 5]			[- 0.8076 9]	[- 0.8383 4]	[0.4871 3]
	[-0.21670]	[0.92820]		[1.87111]	[3.37733]			
D(ECOGROW TH(-1))	0.006168	-0.394966	3.1959 36	0.522294	0.383815	- 26.184 23	- 3.4654 33	0.0833 78
	(0.32175)	(0.16286)	(13.21 36)	(0.35736)	(0.39097)	(14.17 14)	(2.233 91)	(0.087 28)
			[0.2418 7]			[- 1.8476 9]	[- 1.5512 9]	[0.9553 4]
	[0.01917]	[-2.42525]		[1.46152]	[0.98170]			
D(EXG(-1))	0.005327	0.005778	- 0.0774 00	0.008250	0.029087	0.1347 99	- 0.0335 39	-6.59E- 05
	(0.00567)	(0.00287)	(0.232 95)	(0.00630)	(0.00689)	(0.249 83)	(0.039 38)	(0.001 54)
			[- 0.3322 7]			[0.5395 7]	[- 0.8516 4]	[- 0.0428 0]
	[0.93922]	[2.01259]		[1.30954]	[4.22012]			
D(LOG(EXP0 1(-1)))	-1.200881	-0.685533	22.423 22	-1.147185	-2.088860	- 10.309 07	4.3319 43	- 0.0865 46
	(0.56811)	(0.28755)	(23.33 11)	(0.63099)	(0.69033)	(25.02 21)	(3.944 37)	(0.154 10)
			[0.9610 9]			[- 0.4120 0]	[1.0982 6]	[- 0.5616 2]
	[-2.11383]	[-2.38403]		[-1.81807]	[-3.02589]			
D(LOG(IMP(- 1)))	0.336094	0.104570	- 8.6169 21	0.251050	0.127936	11.880 45	- 1.1075 13	0.0324 98
	(0.17244)	(0.08728)	(7.081 70)	(0.19153)	(0.20954)	(7.594 98)	(1.197 24)	(0.046 77)
			[- 1.2167 9]			[1.5642 5]	[- 0.9250 6]	[0.6947 9]
	[1.94907]	[1.19809]		[1.31079]	[0.61057]			
D(INF(-1))	0.022647	0.002246	0.1921 57	0.002448	-0.010805	0.3924 07	0.0786 05	- 0.0008 70
	(0.00522)	(0.00264)	(0.214	(0.00580)	(0.00634)	(0.229	(0.036	(0.001

			39)			93)	24)	42)
	[4.33824]	[0.85015]	[0.89630]	[0.42228]	[-1.70330]	[1.70664]	[2.16872]	[- 0.61464]
D(INT(-1))	-0.073840	0.007904	- 0.465233	-0.038547	-0.015549	0.124238	0.194095	0.001141
	(0.02785)	(0.01410)	(1.14395)	(0.03094)	(0.03385)	(1.22686)	(0.19340)	(0.00756)
			[- 0.40669]			[0.10126]	[- 1.00361]	[0.15095]
	[-2.65089]	[0.56060]		[-1.24592]	[-0.45939]			
D(OPN(-1))	3.457659	1.640121	- 74.21903	2.119150	5.722051	15.36691	21.34895	0.215644
	(1.76722)	(0.89449)	(72.5762)	(1.96283)	(2.14741)	(77.8365)	(12.2698)	(0.47936)
			[- 1.02264]			[- 0.19743]	[- 1.73996]	[- 0.44985]
	[1.95656]	[1.83358]		[1.07964]	[2.66463]			
C	0.443252	0.044857	8.840362	0.313556	0.317629	1.465935	0.258228	0.033286
	(0.09273)	(0.04694)	(3.80830)	(0.10300)	(0.11268)	(4.08433)	(0.64383)	(0.02515)
			[2.32134]			[0.35892]	[0.40108]	[1.32329]
	[4.77995]	[0.95570]		[3.04435]	[2.81882]			
R-squared	0.814576	0.626955	0.447222	0.513048	0.797729	0.418880	0.546186	0.478546
Adj. R-squared	0.716410	0.429461	0.154574	0.255249	0.690644	0.111228	0.305931	0.202482
Sum sq. resids	1.815314	0.465075	3061.681	2.239434	2.680422	3521.588	87.50746	0.133568
S.E. equation	0.326777	0.165401	13.42009	0.362948	0.397079	14.39278	2.268810	0.088639
F-statistic	8.297973	3.174546	1.528193	1.990112	7.449506	1.361537	2.273364	1.733462
Log likelihood	-1.867031	16.51747	- 102.1783	-4.701556	-7.128193	104.0675	54.18582	33.35996
Akaike AIC	0.879039	-0.482775	8.3095	1.089004	1.268755	8.4494	4.7545	-

			00			48	05	1.7303 67
Schwarz SC	1.358979	-0.002836	8.7894 40	1.568944	1.748695	8.9293 88	5.2344 45	1.2504 27
Mean dependent	0.276313	-0.026752	5.8307 19	0.277187	0.282677	0.4296 30	0.3444 44	0.0240 96
S.D. dependent	0.613629	0.218975	14.595 46	0.420571	0.713917	15.266 85	2.7233 09	0.0992 56
Determinant resid covariance (dof adj.)		0.000147						
Determinant resid covariance		3.64E-06						
Log likelihood		-137.4277						
Akaike information criterion		16.69835						
Schwarz criterion		20.92182						