The Impact of Foreign Direct Investment on Nigeria's Economic Growth; 1980-2009: Evidence from the Johansen's Cointegration Approach

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Abstract

This paper investigates the relationship between foreign direct investment (FDI) and economic growth in Nigeria between 1980-2009 through the application of Johansen Cointegration technique and Vector Error Correction Methodology in which FDI is disaggregated into various components. Similarly, it examines the determinants of FDI in Nigeria. The Johansen Cointegration result establishes that the impact of the disaggregated FDI on real growth in Nigeria namely: agriculture, mining, manufacturing and petroleum sectors is very little with the exception of the telecom sector which has a good and promising future, especially in the long run. Furthermore, past level of FDI and level of infrastructures are FDI enhancing. In the light of the above, the paper recommends, among other things, the creation of enabling investment climate in Nigeria through the overhauling of the security system which will help in no small measure in boosting investors' confidence as instability scare way prospective investors. And also, there is the need to liberalise the foreign sector in Nigeria while all barriers that are inimical to cross-border trade such as arbitrary tariffs; import and export duties and other levies should be reduce to the beeriest minimum or, if possible, removed.

Keywords: *Foreign Direct Investment, Economic Growth, Johansen Cointegration, Vector Error Correction Model.*

1.0 Introduction

Various classifications have been made of Foreign Direct Investment (FDI). For instance, FDI has been described as investment made so as to acquire a lasting management interest (for example, 10 percent of voting stock) and at least 10 percent of equity shares in an enterprise operating in another country other than that of the investor's country (Mwillima, 2003). Policy makers believe that FDI produces positive effects on host economies. Some of these benefits are in the form of externalities and the adoption of foreign technology (Alfaro et al, 2006). According to Tang et al (2008), multinational enterprises (MNEs) diffuse technology and management know-how to domestic firms. When FDI is undertaken in high risk areas or new industries, economic rents are created accruing to old technologies and additional management styles.

It has been theorized by development economists that the integration of developing countries with the global economy increased sharply in the 1990s with changes in their economic policies and lowering of barriers to trade and investment. Most countries strive to attract foreign direct investment (FDI) because of its acknowledged advantages as a tool of economic development. Africa – and Nigeria in particular – joined the rest of the world in seeking FDI as evidenced by the formation of the New Partnership for Africa's Development (NEPAD), which has the attraction of foreign investment to Africa as a major component. FDI is assumed to benefit a poor country like Nigeria, not only by supplementary domestic investment, but also in terms of employment creation, transfer of technology, increased domestic competition and other positive externalities (Ayanwale, 2007).

Nigeria is one of the economies with great demand for goods and services and has attracted some FDI over the years. The amount of FDI inflow into Nigeria was estimated at US$2.23 billion in 2003 and rose to US$5.31 billion in 2004 or an increase of 138 percent. The figure rose again to US $9.92 billion or 87 percent increase in 2005. The figure, however, slightly declined to US$ 9.44 in 2006 (Locomonitor.com). The question that comes to mind is, do these FDIs actually contribute to economic growth in Nigeria? If FDI actually contributes to growth, then the sustainability of FDI is a worthwhile activity, and a way of achieving its sustainability is by identifying the factors contributing to its growth with a view to ensuring its enhancement.

This is even more so as Africa and indeed Nigeria is undoubtedly facing an economic crisis situation featured by inadequate resources for long-term development, high poverty level, low capacity utilization, high level of unemployment and other Millennium Development Goals (MDGs) increasingly becoming difficult to achieve by 2020. In fact, one of the pillars on which the New Partnership for Africa's Development (NEPAD) was launched was to increase available capital to US$64 billion through a combination of reforms, resource mobilization and a conducive environment for FDI (Funke and Nsouli, 2003). Nigeria as a country, given her natural resource base and large market size, qualifies to be a major recipient of FDI in Africa and indeed is one of the top three leading African countries that consistently received FDI in the past decade. Despite the enormous amount of literature in this field of study, the empirical linkage between FDI and economic growth in Nigeria is yet unclear (see for example Akinlo, 2004). The results of studies carried out on the linkage between FDI and economic growth in Nigeria are not unanimous in their submissions.

A closer examination of these previous studies reveal that conscious effort was not made to take care of the fact that more than 60 percent of the FDI inflows into Nigeria is made into the extractive industry (oil). Hence this study actually modeled the influence of natural resources on Nigeria's economic growth. There is also the problem of endogeneity, which has not been consciously tackled in previous studies in Nigeria. Again, most of the studies on FDI and growth are cross-country studies, however; FDI and growth debates are country specific. Earlier studies, for example, Otepola (2002), Oyejide (2005), Akinlo (2004) etc, examine the imparts of FDI on growth and the channels through which it may be benefiting the economy. The objective of this study, therefore, is to examine the long run impact of both extractive and non-extractive FDI on Nigeria's economic growth, hence addressing the country's specific dimension to the FDI growth debate. The study is different from previous studies in terms of scope, even as the effect of the major components of FDI on economic growth will be examined thereby offering the opportunity to assess the differential impact of oil FDI and non-oil FDI on Nigeria's economic growth. The study is divided into 5 sections. In section 2, review of related studies is undertaken. Section 3 focuses on methodology while section 4 presents the results and discussions of findings. Section 5 concludes the study with some remarks.

2.0 Literature Review

2.1 Theoretical Framework

Renewed research interest in FDI stems from the change of perspectives among policy makers from "hostility" to "conscious encouragement," especially among developing countries. FDI had, until recently, been seen as "parasitic" and retarding the development of domestic industries for export promotion. However, Bende-Nabende and Ford (1998) submits that the wide externalities in respect of technology transfer, the development of human capital and the opening up of the economy to international forces, among other factors, have served to change the former image. Caves (1996) observe that the rationale for increase efforts to attract more FDI stems from the belief that FDI has several positive effects. Among these are productivity gain, technology transfers, and the introduction of new processes, managerial skills and know-how in the domestic market, employee training, international production networks, and access to markets. Carkovic and Levine (2002) notes that the economic rationale for offering special incentives to attract FDI frequently derives from the belief that foreign investment produces externalities in the form of technology transfers and spill-over. According to Althukorala (2003), FDI provides much needed resources to developing countries such as capital, technology, managerial skills, entrepreneurial ability, brand and access to markets which are essential for developing countries to industrialize, develop, create jobs and attack the poverty situation in their countries.

Dauda (2007) argues that FDI is generally believed to propel economic growth in developing countries as it makes significant contributions to the host country's development process especially through easing of the constraints of low levels of domestic savings and investment as well as foreign exchange shortages. He further argues that FDI increases the GDP and generates a stream of real incomes in the host country. The increased productivity benefits local income groups through higher wages and expanded employment, lower product prices paid by consumers, rent to local resource owners, and high tax revenue or royalties to the government.

2.2 Empirical Framework

Dritsaki et al (2004) applies a cointegration and causality approach in which they find a positive long-run equilibrium relationship between FDI and economic growth and a-one-way causality between FDI and economic growth, running from FDI to growth.

De Gregorio (2003) in his contribution to the debate on the importance of FDI notes that FDI may allow a country to bring in technologies and knowledge that are not readily available to domestic investors and in this way increase productivity growth in the economy. In his study, he finds that increasing aggregate investment by 1 percent point of GDP increases economic growth of Latin American countries by 0.1 to 0.2 percent a year, but increasing FDI by the same amount increases growth by approximately 0.6 percent a year during the periods of 1980 – 85, thus indicating that FDI is three times more efficient than domestic investment. Ledyaeva and Linden (2006) determines the FDI impact on per capita growth in 74 Russian regions during the periods 1996 – 2003. Their framework related real per capita growth rate to initial levels of state variables such as the stock of physical capital and the stock of human capital and control variables viewed as important factors in the Russian economy's regional development in the analyzed period. Their results imply that in general FDI (or related investment components) do not contribute significantly to economic growth during the period but that some evidence of positive aggregate FDI effects in higher income regions is relevant. However, FDI seems not to play any significant role in the recent growth convergence process among Russian regions.

Tang et.al (2008) explores the causal link between FDI, domestic investment and economic growth in China between 1988 – 2003 using the multivariate VAR and ECM. The results indicate that there is a bi-directional causality between domestic investment and economic growth, while there is a single directional causality from FDI to domestic investment and economic growth. Ogbekor (2005) examines the role of exports and FDI on the growth of Namibian economy from 1991 to 2001. Using a combination of bivariate and multivariate variable models, the study concludes that FDI and export aids economic growth potential. Athukorala (2003)'s study on the impact of foreign direct investment on economic growth in Sri Lanka between 1959 – 2002, agrees that the regression results do not provide much support for the view of robust link between FDI and growth in Sri Lanka. He posits that the situation is due to lack of improved investment climate such as good governance, accountability, political instability and disturbance, bureaucratic inertia, among other reasons. Kumar and Pradham (2002) analyze the relationship between FDI, growth and domestic investment for a sample of 107 developing countries for the periods 1980 – 99. Their model uses flow of output as the dependent variable and domestic and foreign owned capital stock, labour, human skills, capital stock and total factor productivity as their independent variables. Their results show that panel data estimations in a production function framework suggest a positive effect of FDI on growth, although FDI appears to crowd out domestic investments in net terms, in general, some countries have had favourable effects of FDI on domestic investments in net terms, suggesting a role for host country policies.

FDI could be beneficial in the short run but not in the long run. Durham (2004) for example, fails to establish a positive relationship between FDI and growth but instead suggests that the effects of FDI are contingent on the "absorptive capacity" of host countries. Obwona (2001) notes in his study of the determinants of FDI and their impact on growth in Uganda that macroeconomic policy, political stability and policy consistency are important parameters determining the flow of FDI into Uganda and that FDI affects growth positively but insignificantly.
There have also been some studies on FDI and growth in Nigeria with varying results and submissions. Ayanwale (2007) employs an augmented growth model via the ordinary least square and the 2SLS methods to ascertain the relationship between FDI, its components and economic growth. His results suggest that the determinants of FDI in Nigeria are market size, infrastructure development and stable macroeconomic policy. Openness to trade and available human capital are, however, not FDI inducing but FDI was found to contribute to economic growth in Nigeria. Ayadi (2009) investigates the relationship between FDI and economic growth in Nigeria (1980 – 2007) and finds a very weak correlation and causality between the variables and recommends that infrastructural development, human capital building and strategic policies towards attracting FDI should be intensified.

Osinubi and Amaghionyediwe (2010) investigates the relationship between foreign private investment (FPI) and economic growth in Nigeria for the periods 1970 – 2005 and find that FPI, domestic investment growth, net export growth and the lagged error term were statistically significant in explaining variations in Nigeria economic growth. Ayashagba and Abachi (2002) explore the relationship between FDI and economic growth in Nigeria during the periods 1980 -1997 and find that FDI had significant impact on economic growth. In a study on the impact of FDI on economic growth in Nigeria, for the periods 1970 – 2001, Akinlo (2004) through his ECM results shows that both private capital and lagged foreign capital have little and not statistically significant effect on the economic growth. The results seem to support the argument that extractive FDI might not be growth enhancing as much as manufacturing FDI.

Ayanwale and Bamire (2004) report a positive and significant effect of FDI on the productivity of both domestic and foreign firms in the Nigerian Agro/agro Allied sector.

2.3 Analysis of FDI inflow into Nigeria by Sectors

Although there has been some diversification into the manufacturing sector in recent years, FDI in Nigeria has traditionally been concentrated in the extractive industries. Table 1 shows the composition of FDI in Nigeria by sectors from 1980–2009. It can be observed from the table that the mining and quarrying sector seems to have been next to the manufacturing sector in receiving FDI attention. For instance between 1980-84, its average percentage share of total FDI in Nigeria was 14.1 percent, reaching the peak of 43.5 percent in 1995-99 and decline to the trough of 22.6 percent in the period between 2005-09. The average share of this sector in total FDI between the periods 1980-2009 was about 26 percent.

The manufacturing and processing sector received enormous attention as can be seen from the table 1. In 1980-84, its share of total FDI stood at 38.3 percent; it reaches the peak of 43.7 percent between the periods 1990-94, fell to 23.6 percent in 1995-99 and rose to 40.7 percent in 2005-09. Its average total all through the period was, however, 34.8 percent in 1980-2009. FDI in trading and business and other miscellaneous services also received some boost but not as much as the two sectors already mentioned. FDI on building and construction was not encouraging as it averaged 4.2 percent in the entire period under consideration. The worst hard-hit was the agriculture, forestry and the fisheries sector. From 1.4 percent in 1980-84, it rose marginally to 1.7 percent in 1990-94, fell to the trough of 0.4 percent in 1995-99 and rose to all record high of 2.1 percent in 2005-09. It averaged 1.3 percent of total FDI in 1980-2009.

Table 1: Percentage Composition of FDI in Nigeria by Sectors, 1980-2009

Year	M&Q	Man	Agric	T & C	B & C	T & B	Mis Ser
1980-84	14.1	38.3	2.6	1.4	7.9	29.2	6.5
1985-89	19.3	35.3	1.4	1.2	5.1	32.6	5.3
1990–94	22.9	43.7	2.3	1.7	5.7	8.4	15.4
1995–99	43.5	23.6	0.9	0.4	1.8	4.5	25.3
2000–04	34.7	27.4	0.7	1.1	2.5	7.6	26.0
2005-09	22.6	40.7	0.4	2.1	2.2	8.2	23.9
1980–09	26.2	34.8	1.4	1.3	4.2	15.1	17.1

Source: CBN *Statistical Bulletin* (2009) and authors' computation.
Where:

M & Q: Mining and Quarrying
Man: Manufacturing and Processing
Agric: Agriculture, Forestry and Fisheries
T & C: Transport and Communication
B & C: Building and Construction
T & B: Trading and Business
Mis Ser: Miscellaneous Services

Agriculture, transport and communications, and building and construction remained the least attractive hosts of FDI in Nigeria. If the report of the privatization programme (CBN 2004) is anything to go by, however, the transport and communication sector seem to have succeeded in attracting the interest of foreign investors, especially the telecommunication sector. Nigeria is currently described as the fastest growing mobile phone market in the world. Since 2001, when the mobile telecommunication operators were licensed, the rate of subscription has gone up and does not show any sign of abating. In fact, MTN (Nigeria) – the leading mobile phone operator – has acquired another line having oversubscribed the original line. The four operators – MTN, Airtel, Glo and Etisalat – are currently engaged in neck and neck competition that has forced the rates down and in the process fostered consumer satisfaction. Although this is not without some hiccups which arises from occasional network congestion, due mainly to excessive promos by the network providers. The effect of this positive development in the telecommunication sector is yet to be translated to the other sectors of Nigerian economy. From the analysis of FDI inflow in Nigeria by sectors, it is very glaring that FDI flows are concentrated in the primary sectors, mainly oil and gas, which are not linked to the domestic economy.

This trend of FDI flow has some important implications for the nation's economy. First, even though the volume of FDI to Nigeria has increased substantially since the 1990s, Nigeria remains largely marginalised in the context of financial globalisation. Second, spill over effects of FDI in oil exploration and other mining activities are minimal as the technology employed is capital rather than labour intensive. This means that the effect of FDI in Nigeria to date has been dependent on what the revenues are used for. Third, the flow of FDI to the extractive sector is not growth enhancing as much as other productive sectors, because oil sector is often an enclave sector with little backward and inward linkages with other sectors. Fourth, secondary and tertiary activities like manufacturing and services are not playing leading roles in the determination of national output, employment generation and income, and this partly explains why the majority of Nigerian citizens are living in poverty, the country's huge petroleum resources notwithstanding.

Thus, the solution to these problems is to attract FDI into diversified and higher value-added activities. In this regard, one important policy objective to reduce the barriers to FDI effectiveness is to build diversified economy through investment in human capital, infrastructure and productive capacity. Clearly then, the challenge for Nigeria is how to attract FDI in more dynamic products and sectors with income elasticity of demand.

3.0 Methodology

This chapter comprises the model specification in which the variable of FDI is disaggregated. Unit root, cointegration and error correction mechanism (ECM) will also be estimated.

3.1 Theoretical Framework

The methodology involves estimating an econometric model in which the link between FDI and economic growth in Nigeria is investigated. This section develops the estimating equation and draws from the literature by using the augmented production function approach in investigating the interaction of FDI and trade policy regime in economic growth in Nigeria during the period of 1980 – 2009.

Following the analytical framework provided by Obwona (2001), let a country's production be represented by the following aggregate production function.

$$Y = f(L, K, A) \ldots\ldots\ldots\ldots (1)$$

Where

Y	=	Output (Gross Domestic Product (GDP)
L	=	Employment
K	=	Capital stock
A	=	Total Factor Productivity (TFP) of growth in output, not accounting for increase in factor outputs (K and L).

The study will employ the endogenous growth mode. According to this growth theory, A is endogenously determined by economic factors. In this study, it will not be possible to separate local and foreign components of domestic investment as there are no available data in the literature that have fully captured addition to domestic investment by foreign firm (Lipsey 2001). We will assume that the effect of FDI on economic growth operating through A depends on trade policy regime; hence a proxy variable for the openness of trade policy regime (TP) needs to be incorporated in the equation.

$$A = g(FDI, DOP) \ldots\ldots\ldots\ldots (2)$$

Substituting equation (2) into (1) yields:

$$Y = f(L, K, FDI, DOP) \ldots\ldots\ldots (3)$$

In view of the fact that a reliable series on capital stock is not available for Nigeria, this study will employ the ratio of gross fixed domestic capital formation to GDP to represent K. This proxy variable has been used in numerous previous studies (see for example, Athukorala, 2003 and Ayanwale, 2007). There is no unique measurement of the openness of trade policy regime. We shall, therefore, use the ratio of total merchandise trade (import + export) to GDP as a proxy for index of openness due to availability of data. Since FDI is our variable of interest, it is disaggregated as follows:

$$Y = (L, K. FDIAg, FDI Min, FDIPet, FDIMan, FDITel, DOP) \ldots\ldots (4)$$

The long linear form of the equation can be written thus:

In $Y_t = a_o + a_1 \ln L_t + a_2 \ln K_t + a_3 \ln FDIAg_t + a_4 \ln FDIMin_t + a_5 \ln FDIPet_t$
$+ a_6 \ln FDIMan_t + a_7 \ln FDITel_t + a_8 \ln DOP_t + U_t$ …………………..   (5)

Where

Y	=	Gross Domestic Product
L	=	Labour force proxied by population
K	=	Ratio of Gross Domestic Fixed Capital Formation to GDP
FDIAg =		FDI in Agricultural Sector
FDIMin		FDI in Mining Sector
FDIPet =		FDI in Petroleum Sector
FDIMan =		FDI in Manufacturing sector
FDITel=		FDI in Telecom sector
DOP	=	Degree of openness (export + import) to GDP
t	=	Time subscript
U	=	Error time

Aprori signs of the variables are expected to be positive; a_o is an intercept, while $a_1 - a_5$ are the coefficients to be estimated. All the variables are in log form. The long run equilibrium and the short run dynamics of this model will be estimated.

3.3 Unit root Test

In order to avoid estimating spurious regression, the stochastic properties of the series will be tested. Several procedures for the test of order of integration have been developed in which the most popular one is the Augmented Dickey-Fuller (ADF). The ADF test relies on rejecting a null hypothesis of unit root (the series are non-stationary) in favour of the alternative hypothesis of stationarity. The general form of the ADF is estimated by the following regression.

$$\Delta y_t = a_0 + a_1 y_{t-1} + \sum_{i=1}^{n} a\Delta y_i + e_t \dots\dots\dots\dots\dots(6)$$

$$\Delta y_t = a_0 + a_1 y_{t-1} + \sum_{n=1}^{n} a_1 \Delta y_i + \delta_t + e_t \dots\dots\dots\dots.(7)$$

Where y_t is a time series, it is a linear time trend, Δ is the first difference operator, d_o is a constant, n is the optimum number of lags in dependent variable and e is the random error term.

3.4 Co-integration Test

This involves testing for the presence or otherwise of long-run equilibrium between the series of the same order of integration through forming of co-integration equation. We will employ the maximum likelihood test procedure suggested by Johansen and Juselius (1988, 1990). Specifically, if y_t is a vector of n stochastic variables, then there exists a p-lag vector auto-regression with Gaussian errors of the following form in which Johansen and Juselius's methodology takes its starting point in the vector auto regression (VAR) of order P given by:
$y_t = \mu + \Delta_1 y_{t-1} + \dots\dots\dots\dots +\Delta p y_{t-p} + \varepsilon_t \dots\dots\dots(8)$
Where

y_t is an nx1 vector of variables that are integrated of order commonly denoted (1) and ε_t is an nx1 vector of innovations.
This VAR can be written as

$$\Delta y_t = \mu + n y_{t-1} + \sum_{i-1}^{p-1} \Gamma_i \Delta y_{t-1} + \varepsilon_t \dots\dots\dots\dots\dots..(9)$$

$$\prod = \sum_{i=1}^{p} A_{i-1} \text{ and } \Gamma i = -\sum_{j=i+1}^{p} A_j$$

To determine the number of co-integration vectors, Johansen (1988) and Johansen and Juselius (1988, 1990) suggested statistical test: the first one is the trace test (λ trace).

It tests the null hypothesis that the number of distinct cointegrating vector is less than or equal to q against a general unrestricted alternatives q = r, this test is shown below.

$$\lambda\ trace\ (r) = -T \sum_{i=r+1} \hat{In}\ (1 - \lambda_t)\ldots\ldots\ldots(10)$$

Where:

T is the number of usable observations, and λ1's are the estimated eigen value from the matrix. The second statistical test is the maximum eigen value test (λ max) that is calculated according to the following formula.

$$\lambda max\ (r, r + 1) = - T\ In\ (1 - \lambda r + 1)\ldots\ldots\ (10)$$

The test concerns a test of the null hypothesis that there is r cointegrating vectors against the alternative of r + 1 co integrating vector.

3.5 The Error Correction Model (ECM)

If cointegration is proven to exist, then the next step requires the construction of ECM to model dynamic relationship. The purpose of the ECM is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the coefficient of the parameter, the higher the speed of adjustment of the model from the short-run to the long run state will be.

Therefore, equation (5) will be represented to include ECM to reflect the short run dynamics.

$$\Delta InY_t = a_0 + \sum_{i-1}^{n} a_{1t}\Delta InY_{t-1} + \sum_{i-1}^{n-1} a_{2t}\Delta InL_{t-1} + \sum_{i-1}^{n-1} a_{3t}\Delta InK_{t-1} +$$

$$\sum_{i-1}^{n-1} a_{4t}\Delta InFDIAg_{t-1} + \sum_{i-1}^{n-1} a_{5t}\Delta InFDIMin_{t-1} + \sum_{i-1}^{n-1} a_{6t}\Delta InFDIPet_{t-1} +$$

$$\sum_{i-1}^{n-1} a_{7t}\Delta InFDIMan_{t-1} + \sum_{i-1}^{n-1} a_{8t}\Delta InFDITel_{t-1} + \sum_{i-1}^{n-1} a_{9t}\Delta InDOP_{t-1} +$$

$$\lambda ECM_{t-1} + vt\ldots\ldots\ldots\ldots(11)$$

Where

Δ is the first difference operator and λ is ECM coefficient and the remaining variables are as already defined above.

3.7   Determinants of FDI in Nigeria

Establishing the determinants of FDI in Nigeria will enable us to achieve our third objective. The functional form of the model is specified below as follows:

$$FDI_t = f(INFRA_t, GOVS_t, DOP_t, INF_t, PRK_t)\ldots\ldots\ldots(20)$$

In log stochastic form this can be written as:

$$LogFDI_t = \beta_0 + \beta_1 LogINFRA_t + \beta_2 LogGOVS_t + \beta_3 LogDOP_t + \beta_4 LogINF_t + \beta_5 LogPRK_t + u_t\ldots\ldots\ldots\ldots(21)$$

Where

FDI   = Foreign Direct Investment

INFRS= Level of Infrastructure (share of secondary and university enrolments in the population)

GOVS = Government consumption as a ratio of GDP

DOP   = Openness of the economy (export + import) as a ratio of GDP

INF   = the rate of inflation

PRK   = Political risk measured by coups d'etat, hostage taking and bomb blasts (dummy variables)

u   =   Error term

t   =   time trend

β_o = Constant, β_1 - β_5 coefficient to be estimated. The approx signs of the coefficients are that β_1 - $\beta_3 > 0$ and β_4 and $\beta_5 <> 0$.

4.0 Results Presentation and Discussions

4.1 Unit Root Test Results for Stationarity, 1980-2009

The ADF results in table 4.1 below show that all the variables are non stationary at level but became stationary at integration of order one, i.e.I(1) at both 1 and 5 percent confidence levels.

Table 4.1 ADF Test Results

Variables	Order	Included in Test Equation	ADF Test Statistic	Mackinnon Critical Value
Log RGDP	I(I)	Trend & Intercept	-4.039	5%=-3.587
Log L	I(I)	Trend & Intercept	-3.697	5%=-3.587
Log K	I(I)	Trend & Intercept	-3.810	5%=-3.587
Log FDIAg	I(I)	Trend & Intercept	-4.617	1%=-4.355
Log FDIMin	I(I)	None	-3.021	1%=-2.670
Log FDIMan	I(I)	Trend & Intercept	-3.987	5%=-3.587
Log FDITel	I(I)	Trend & Intercept	-3.617	5%=-3.587
Log FDIPet	I(I)	None	-3.459	1%=-2.728
DOP	(I)	Trend & Intercept	-7.213	1%=-4.338

4.2 Cointegretion Results

The results of cointegretion test reveal that all the variables employed have long run equilibrium with the exception of FDIPet (see appendix 1 for detail results) which could not be incorporated into the equation and was, therefore, removed. A different estimate of the relationship between RGDP and FDIPet is presented in table 4.2 below using a two stage least squares.

Table 4.2: Cointegration Results (The Trace and Eigenvalue Tests)

Null Hypothesis	Alternative Hypothesis	Statistical Value	5% Critical Value	1% Critical Value	Eigen Value
Trace Tests					
r = 0	r ≥ 0	450.8**	165.6	177.2	0.999
r ≤ 1	r ≥ 1	286.8**	131.7	143.1	0.958
Max-Eigenvalue Tests					
r = 0	r = 1	164.0**	52.0	58.0	0.999
r ≤ 1	r = 2	79.1**	46.5	52.1	0.958

*(**) denotes rejection of the hypothesis at the 5% (1%) level

The trace test indicates eight cointegreting equations at both the 5 and 1 percent confidence levels while the max-eigenvalue test indicates 3 and 5 cointegreting equations at 1 and 5 percent levels respectively.

4.3 Long run Economic Growth and FDI Components Regression Results

With cointegration confirmed for the economic growth model, the long-run model was estimated. The results show that capital formation and especially labour and/or employment in Nigeria are growth inducing, although with a low coefficients. For example, the elasticity coefficient of gross fixed capital formation shows that a percentage increase in capital formation increases real GDP by 0.08 percent and employment by 0.5 percent respectively. Further, the results show that FDI in mining and quarrying and manufacturing and processing sectors are not growth enhancing at least during the period under review.

This is not surprising as these sectors have been neglected in the last two decades. However, FDI in mining and quarrying is barely significant in explaining economic growth in Nigeria as it shows that a one percent increases in mining and quarrying reduces real growth by 0.04 percent.

Long run RGDP and Disaggregated FDI Estimates

InRGDP = 9.3 + 0.5InL + 0.08InK + 0.002InFDIAg – 0.04InFDIMin -
        (13.7) (3.0)   (1.6)   (0.1)   (-1.8)

0.02InFDIMan + 0.2InFDITel + 0.02DOP
 (-0.3)   (3.6)   (0.6)

R^2 = 0.99; Adj R^2 = 0.99; F-Start = 287.8; DW = 1.7

On the other hand, a positive relationship is observed in FDIAg and FDITel sectors. But while FDIAg is not significant, that of FDITel sector is highly significant in explaining real growth rate in Nigeria during the period of the study. Similarly, there is a positive relationship between degree of openness (DOP) and real growth in Nigeria. These results give credence to the findings of Anyawale (2007).

The DOP variable could not be included in the short run dynamics as estimation became problematic and was, therefore, dropped just as cointegration test could not be carried out for the log value of DOP probably because of the insufficient number of observations which we think was also the same problem with FDIPet sector. Finally, the adjusted R^2 is highly robust while the F-Start revealed absence of serial autocorrelation.

4.4   Short run Economic Growth and FDI Components Regression Results

With the confirmation that the residuals from the cointegration regression are stationary, the dynamic version of the long run model was specified with the residuals from the cointegration regression as error correction model (ECM).

Short run Model Estimates
DInRGDP = 0.3 – 8.5DInL + 0.5DInK –0.1DInFDIAg –0.3DInFDIMin
           (1.6) (-1.1)   (1.5)   (-0.5)   (-1.5)

+0.2DInFDIMan + 0.1DInFDITel – $0.12ECM_{t-1}$
  (0.7)   (0.7)   (-2.0)
R^2 = 0.590; Adj R^2 = 0.24;

The results stated above are the parsimonious model at lag one and they indicate that in the short run employment, FDIAg and FDIMin negatively impacted on real growth. However, only FDIMin is barely significant in explaining real growth in Nigeria. On the contrary, gross fixed capital formation (K), FDIMan and FDITel sectors have positive relationship with real growth in Nigeria. Apart from K which is significant in explaining real growth rate in Nigeria, though with a smaller elasticity coefficient, FDIMin and FDITel were, however, not significant. Thus like the long run, the short run results do not provide much support for the view of robust link between disaggregated FDI and growth in Nigeria. Athukorala (2003) in his study in Sri Lanka, Ledyaeva and Linden (2006) in Russian and Akinlo (2004) in Nigeria had earlier reached a similar conclusion.

The coefficient of the error correction model (ECM(-1)) indicates the speed at which aggregate growth rate adjusts in the long run to its main driving force. It further show, that the variable is well defined as it observes the usual negative signs that enable it to adjust to equilibrium position whenever the system is out of equilibrium and more so as the ECM coefficient is significant. For instance the ECM coefficient shows that whenever the system is out of equilibrium, it is restored back with a speed of about 12 percent.

Table 4.3;   2SLS Regression Results – FDIPtel and Growth

Depended Variable RGDP

Variable	Coefficient	t-value
Constant	1211.305	0.03
FDIPet	0.003	0.30
RGDP(-1)	1.002	3.45

$R^2 = 0.98$; Adj $R^2 = 0.98$; F-Start = 559.0; DW= 1.63

The results of the two stage least squares (2SLS), show that the model is well estimated as it shows a better goodness of fit statistic (i.e, high and robust R^2), and the absence of serial autocorrelation as the DW-statistic of 1.63 falls within the region of no autocorrelation of between 1.59 – 2.41. The 2SLS option was employed as the ordinary least squares (OLS) could not provide better results while the addition of a one-year lag of RGDP to the independent variable was to further improve the results.

The results, therefore, show that a positive relationship exists between real growth rate and FDI in petroleum sector and one year lag of RGDP. However, only the previous RGDP is significant in explaining the current real growth. This shows that even though the bulk of FDI in the extractive sector in Nigeria is mainly in the petroleum sector, such impact is yet to translate into real growth.

Table 4.4: Unit Root Test on Determinants of FDI in Nigeria

Variable	Order	Included in Test Equation	ADF Test Statistic	Mackinnon Critical Value
FDI	I(2)	Trend & Intercept	-6.6198	1%=-4.355
Log INFRS	I(I)	Intercept	-4.4438	1%=-3.696
Log GOVS	I(I)	Trend & Intercept	-5.6697	1%=-4.338
Log DOP	I(I)	Intercept	-4.3883	1%=-3.830
Log INF	I(I)	Trend & Intercept	-5.7369	1%=-4.338

Table 4.4 shows that all the variables are non-stationary at level and became stationary at both 1 and 5 percent confidence levels after first differencing.

Regression Results on Determinants of FDI in Nigeria

FDI = -623981.7 – 1118.7InDOP+153381.7InINFRS+ 14541.4InGOVS
        (-4.6)   (0.1)   (4.8)   (1.3)

+120.8InINF + 1.1FDI (-1) – 279.7PRK
  (0.03)   (8.2)   (-0.02)
$R^2 = 0.97$; Adj $R^2 = 0.97$; F-Stat = 124.0; DW = 2.22

A cursory look at the results reveal that serial correlation is not a problem as the DW stat passed the critical test of no autocorrelation as both R-squares are highly robust depicting a better goodness of fit. The R^2 of 0.97 simply shows that about 97 percent of FDI in Nigeria is explained by the variables employed in this study. The F-stat of 124.0 also shows that the overall equation is highly significant in explaining real growth in Nigeria. The semi-log option was adopted as the double log could not provide a better result and there was a severe case of serial correlation. The results show that the Nigerian foreign sector proxied by the degree of openness (DOP) and the political situation (some of which included military coups, kidnappings, bombing, serial killing etc) does not provide investment friendly environment for the foreign investors and have thus negatively constrained FDI in Nigeria, although they are statistically not significant.

On the other hand, the past level of FDI (FDI(-1)), levels of infrastructure (INFRS), size of government spending (GOVS) and inflation rate (INF) impacted positively on FDI in Nigeria. In particular, past level of FDI and infrastructures are highly significant in explaining FDI during the review period.

The results, however, should be viewed with caution especially when we consider the gory state of infrastructure such as power supply, road networks, water supply etc in Nigeria. The coefficient of inflation, although positive, neither constrained nor stimulates FDI in Nigeria. The same results have also been found by Obwona (2001) on the determinants of FDI in Uganda, and Ayanwale (2007) in Nigeria.

5.0 Conclusion and Recommendations

This study is embarked upon because of the benefits derivable from FDI by any country especially Sub Sahara African (SSA) like Nigeria. It has been argued in the literature that Nigeria is one of the economies with great demand for goods and services and has attracted FDI over the years. This is explained by the volume of FDI inflows to Nigeria valued at US$2.23 billion in 2003 and rose to US$5.31 billion in 2004. However, the snag is that, this volume of FDI has not been actually transformed into the expected level of development in Nigeria as its impact has not been fully maximised. This is the premise upon which the study is germane.

The empirical findings revealed that the impact of FDI disaggregated into several components namely: agriculture, mining, manufacturing, telecommunication and petroleum sectors are very little with the exception of the telecom sector which has a promising future for the economy especially in the long run. Similarly, the study looked at the determinants of FDI in Nigeria within the review period and it was discovered that previous level of FDI performance in Nigeria goes a long way to influence the foreigner's present decision to invest in the country. It was also found that the state of the country's infrastructures has, to a larger extent, induced FDI inflows in Nigeria. However, this outcome should be viewed with caution as it may have been influenced by the nature of data employed in the study.

On the basis of our findings, the major conclusion that can be drawn from the study is that Nigeria is yet to fully reap the benefits of FDI, as its impact on growth at the moment is very little. However, hopes are rift that if round pegs are put in round holes, the anticipated benefits of FDI will begin to manifest in Nigeria. We, therefore, recommend that the level of security at all levels in the country should be overhauled in order to boost indigenous private and foreign investors' confidence as instability in any nation scare away prospective investors. Furthermore, the foreign sector in Nigeria should be liberalized, all barriers to trade that are inimical to cross-border trade such as arbitrary tariffs; import and export duties and other levies should be reduced to the bearest minimum or, if possible removed. There should be clear guide line in government policy regarding priority sectors that require foreign investments in Nigeria among which sectors like agriculture, mining and manufacturing should be uppermost for development. The spill-over effects of the development of these sectors would be manifold increase in rate of employment, GDP and output, food supply and raw materials for industries (especially local ones) and foreign exchange earning etc.

References

Akinlo, A.E. (2004); "Foreign direct investment and growth in Nigeria: A empirical investigation" *Journal of Policy Modelling,* vol. 26 No. 3 pp. 627- 39

Alfaro, L., Arendam, C., Sebrem, K.O.and Selin, S. (2006); "How Does Foreign Direct Investment Promote Economic Growth?" Exploring the Effects of Financial Markets on Linkages. *NBER working paper No 12522.*

Ariyo, A. (1998); "Investment and Nigeria's economic growth". In *Investment in the GrowthProcess Proceedings of Nigerian Economic Society Annual Conference,* pp. 389–415.

Asiedu, E. (2003); "Capital controls and foreign direct investment" *World Development,* 32(3): 479–90.

Asiedu, E. (2005); "Foreign Direct Investment in Africa: The Role of Natural Resources, Market Size, Government Policy, Institution and Political Instability". *UNU/WIDER Research Paper 2005/24.World Institute for Development Economics Research, Helsinki.*

Athukorala P.P.A.W (2003); "The Impact of Foreign Direct Investment on Economic Growth in Sri Lanka" *Proceedings of the Paradeniya University Research Sessions. Vol 8, No.4 pp. 40-57.*

Athukorala P.P.A.W (2003a) " The Impact of Foreign Direct Investment on Economic Growth in Sri Lanka" *Proceedings of the Paradeniya University Research Sessions. Vol 8, pp. 40-56.*

Athukorala, P. P. A. W. (2003b): "The Impact of Foreign Direct Investment for Economic Growth: A case study of Sri Lanka." Paper submitted for the 9th *International Conference on Sri Lanka Studies 28 – 30 Nov.*

Ayanwale, A.B and Bamire, S. (2004); "Direct Foreign Investment and Firm-level Productivity in the Nigerian Agro/agro-allied Sector" *Journal of Social Sciences., vol. 9 No. 1, pp. 29-36*

Ayanwale, A.B. (2007); "FDI and Economic Growth: Evidence from Nigeria" *AERC Research Paper 165, African Economic Research Consortium, Nairobi*

Ayadi, F. S. (2009), "Foreign Direct Investment and Economic Growth in Nigeria." *Proceedings of the 10th Annual Conference of LAABD.*

Ayashagba, G.I., and P.I. Abachi (2002) "The Impact of Foreign Direct Investment On Economic Growth of the Less Developed Countries (LDCs): A Case of Nigeria (1980-1997)". *Journal of Economic and Social Research*, vol.1 No. 3, pp. 108-125.

Bende-Nabende, A., Ford, J. Sen, S and Slater, J.(2002); "Foreign Direct Investment in East Asia:Trends and Determinants". *Asia Pacific Journal of Economics and Business vol.6 No.1, pp.* 4-25.

Duada, R. O. (2007): "The Impact of FDI on Nigeria's Economic Growth: Trade Policy Matters." *Journal of Business and Policy Research, Vol. 3 No.2, pp. 11 – 26.*

De Gregorio, Jose. (2003); "The role of foreign direct investment and natural resources in economic development". *Working Paper No 196. Central Bank of Chile, Santiago.*Studies, vol.34 No.1, pp.1-34.

Desai, M.A. et al. (2005); "Foreign Direct Investment and the Domestic Capital Stock" *The American Economic Review,* vol. 95, No 2, pp 33-38.

Dritsaki, M, Dritsaki C. and Adamopoulos, A. (2004) "A causal Relationship between Trade, Foreign Direct Investment and Economic Growth for Greece." *American Journal of Applied Sciences vol.1 No.3, pp. 230-5.*

Durham, J.B. (2004); "Absorptive capacity and the effects of foreign direct investment and equity foreign portfolio investment on economic growth". *European Economic Review*, vol. 48 No.2, pp. 285–306.

Funke, N. and Nsouli, S.M. (2003); "The New Partnership for Africa's Development (NEPAD): Opportunities and challenges". IMF Working Paper No.03/69. International Monetary Fund, Washington, D.C.

Jerome, A. and Ogunkola, J.(2004); "Foreign Direct Investment in Nigeria: Magnitude, Direction and Prospects". Paper presented to the African Economic Research Consortium Special Seminar Series. Nairobi, April.

Johansen, S. (1988); "Statistical Analysis of Cointegration Vectors". J. Econ. Dynamics andControl, vol. 12 No.6, pp. 231 – 254.

Johansen, S and Juselius, K. (1990); "Maximum Likelihood Estimation and Inference on Cointegration with Applications to the Demand for Money". *Oxford Bulletin of Economics and Statistics, vol. 52 No.2, pp.169-210.*

Nwillima N. (2008); "Characteristics, Extent and Impact of Foreign Direct Investment on African Local Economic Development". *Social Science Research Network Electronic Paper Collection.*

http://ssrn.com.

Obwona, Marios B. (2001). "Determinants of FDI and their Impact on Economic Growth in Uganda". *African Development Review* 2001. Blackwell Publishers Oxford. UK. Pp. 46-80.

Ogamba, E.N. (2003) "The Impact of Globalisation on Foreign Capital Flows in Nigeria", An Unpublished Ph.D. Thesis submitted to the Department of Banking and Finance, UNN, Enugu Campus, Enugu State

Oyejide T. A. (2005); "Capital Flows and Economic Transformation: A Conceptual Framework"on Proceedings of Central Bank of Nigeria 5th Annual Monetary Policy Conference with the theme "Capital Flows and Economic Transformation in Nigeria." Held at the CBN Conference Hall, Abuja. November 10th to 11th.

Osinubi, T. S. and Amaghionyeodiwe, L. A. (2010); "Foreign Private Investment and Economic Growth in Nigeria." *REBS Review of Economic and Business Studies, Vol 3 Issue 1, pp. 105 – 127, June.*

Tang, S., Selvanathan, E.A. and Selvanathan, S. (2008) "Foreign Direct Investment, Domestic Investment, and Economic Growth in China." UNU-WIDER Research Paper No. 2008/19.

Appendix 1: Absolute Data

YEAR	FDI	RGDP	L	K	FDIAg	FDIMin	FDIMAN	FDITel	FDIPet	DOP	INFRS	GOVS	INF	PRK
1980	3620.1	31546.8	84.5	128.3	120.5	677.4	1503.9	62.2	na	-0.0779	55.7	0.1018	16.1	0
1981	3757.9	205222.1	90.4	201.6	120.5	526	1705.7	60.8	na	-0.0148	38.8	0.4162	17.4	0
1982	5382.8	199685.3	89	192.6	120.5	974	1922.5	68.9	na	-0.0369	67.1	0.1713	6.9	0
1983	5949.5	185598.1	91.4	145.9	127.8	511.2	2128.1	77.3	na	-0.0147	66.8	0.1674	38.8	0
1984	6418.3	183563	93.7	97.6	128.5	702.8	2109.3	80.6	na	0.0386	58.5	0.1419	22.6	1
1985	6804	201036.3	96.4	91.3	126	744	2278.1	85.9	na	0.0746	65.2	0.1379	1	1
1986	9313.6	205971.4	99	114.7	128.2	2510.4	2810.2	80.4	-5310	0.0498	74.5	0.1363	13.7	1
1987	9993.6	204806.5	101.5	150	117.3	2260.2	3122.3	75.6	-5235	0.1327	73.6	0.0766	9.7	1
1988	11339.2	219875.6	104	168.9	128.9	3403	3637	160.6	-5235	0.0822	71.9	0.6441	61.2	1
1989	10899.6	236729.6	106.4	252.1	134.8	6367	5406.4	158.2	-5235	0.1419	80.4	0.0574	44.7	1
1990	10436.1	267550	86.7	462.8	334.7	1091.6	6339	240.5	-5235	0.2621	90.8	0.0522	3.6	1
1991	12243.5	265379.1	88.6	510	382.8	-810	8692.4	373.2	17109	0.1431	93.6	0.051	23	1
1992	20572.7	271365.5	91.4	774.7	386.4	6417.2	9746.3	391.5	66548	0.1521	95.2	0.0622	48.8	1
1993	66787	274833.3	93.3	1038.8	1214.9	27686.9	12885.1	426.4	752670	0.1054	107.2	0.0684	61.3	1
1994	70714.6	275450.6	96.8	1090.7	1208.5	26680	14059.9	429.6	827719	0.0682	99.1	0.1885	76.8	1
1995	119391.6	281407.4	99.5	1426.3	1209	56747.3	27668.8	374.8	9459799	0.1279	94.8	0.1256	51.6	1
1996	112600.9	293745.4	102.3	1994.6	1209	56792.3	29814.3	485.6	12383233	0.2511	88.5	0.1037	14.3	1
1997	128331.8	302022.5	105.2	2308.9	1209	56221.4	31297.2	672.6	9467779	0.1461	84.1	0.1348	10.2	1
1998	152409.6	310890.1	108.2	2239	1209	59970.5	34503.9	689.2	9467779	-0.0068	78.8	0.1453	11.9	1
1999	154188.6	312183.5	111.3	2081.1	1209	58855.4	36282.1	820.3	9467779	0.124	77.1	0.0724	0.2	0
2000	157535.4	329178.7	114.4	2893.9	1209	60710.9	37333.6	820.3	946777	0.2312	76	0.0859	14.5	0
2001	162343.4	356994.3	117.9	3156.4	1209	61611.9	37779.6	955.3	9751822.7	0.1623	76.6	0.0853	16.5	0
2002	166031.6	433203.5	122.3	4085.7	1209	61611.9	39953.6	1736.3	9751822.5	0.0554	105	0.0692	12.1	0
2003	174450.3	477533	126.2	6861.1	1209	61809.1	45719.4	2890.5	9751822.7	0.1432	102	0.0531	23.8	0
2004	249220.6	527576	130	6639	1209	62145.7	102995.8	4281.1	11702187.2	0.2292	140.4	0.0689	10	0
2005	269844.7	561931.4	134	6002	1209	80789.4	133894.5	5565.4	15212843.4	0.263	145.1	0.0688	11.6	0
2006	302843.3	595821.6	140	11046.6	1209	105668.4	212729.4	8291	24340549.4	0.2422	145.3	0.0691	8.6	0
2007	364008.5	634251.1	144.2	13282.6	1329	132085.5	219512	10758.2	98886.7	0.2299	145.7	0.0795	6.6	0
2008	399841.9	672202.6	148.1	13710.4	1999.2	91963.6	155938.3	7996.8	13586941.7	0.2279	148.8	0.0576	15.1	0
2009	441271.3	716947.7	152.2	16049.3	12647.6	85606.6	174302.1	13238.1	15186985.7	0.1824	149.2	0.0581	12.1	0