EFFECTS OF FOREIGN DIRECT INVESTMENT ON THE ECONOMY OF NIGERIA: A DISAGGREGATION OF THE REAL SECTOR INVESTIGATION

BY

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Abstract
This research investigates the effects of foreign direct investment in agriculture, manufacturing, solid minerals, telecommunication, petroleum resources, power and construction sectors on the economy of Nigeria using annual data from1986 to 2014 that was sourced from the Central Bank of Nigeria Statistical bulletin. Co-integration test and error correction mechanism were adopted in estimating the effects of long run and the parsimonious short run dynamics of the variables under investigation. The research findings show that in the long run, FDI in agriculture, manufacturing, telecommunication, petroleum resources and construction sectors have significant effect on the economy of Nigeria. The results of the parsimonious short run dynamics revealed that FDI in manufacturing, telecommunication and petroleum resources have positive and significant effect. On the other hand, FDI in agriculture, solid minerals, power, and construction sectors have positive but insignificant effect on the economy of Nigeria. This study recommends policies that will provide effective risk management mechanism to protect investors and assist in encouraging the provision of infrastructural facilities to attract FDI in non-oil sector such as agriculture, power and solid minerals into the country. The study further recommends that distortions caused by government procedures and policies should be removed to foster good business climate for the inflow of foreign direct investment in Nigeria.

Keywords: Nigeria Economy, Foreign Direct Investment, Real Sector, Multinational Corporations, and disaggregation. ***JEL****- Classification: F21, F23, O13, O14*

Introduction

The availability of sources of funding for international businesses offer opportunities for Nigeria and other emerging market economies to invest in infrastructure and facilitate trade finance to foster a self-reinforcing cycle of sustained economic empowerment and poverty reduction (Udeajah, 2011). Based on the current economic reality, there is need for Nigeria to seek foreign capital to sustain her investment demands and enhance economic activities. This may be achieved by establishing transparent rules and procedures that will assist in ensuring consistency in policy objectives and instruments to avoid breach of contracts, strengthen domestic capital market, public-private risk mitigating instruments develop models that will ensure that risk mitigating instruments are put in place and ensure that infrastructural facilities are maintained to attract the inflow of foreign direct investments into Nigeria.

Foreign direct investment is one of the means of providing financial resources for growth and development by most emerging market economies that are unable to generate funds locally for investment and increase in fixed capital formation. According to Feldstein (2000) one of the advantages of FDI is the provision of diversified business opportunities through international flow of capital which will assist in reducing the risk faced by providers of capital in their home countries. Direct foreign investment also provides opportunities for the international transfer of technology and human capital which will ensure healthy competition in the domestic raw material input market. Despite the fact that FDI provide high capital intensive technology that has the potential of reducing unemployment in labour surplus host economy, it contributes to corporate tax revenues in the host country from profits generated.

According to the United Nation Conference on Trade and Development (UNCTAD) (2011) the direction of flow of foreign direct is significantly to the disadvantage of the developing countries of Africa. This

can be linked to the increase in demand for foreign direct investments from the emerging market economies globally. This implies that developing countries where corruption, infrastructural facilities and insecurity pose great challenge to business organizations need to change their strategies to encourage foreign investors and attract foreign direct investments. Africa and indeed Nigeria is undoubtedly in recession characterized by high level of poverty, low capacity utilization, insecurity, corruption and high level of unemployment and needs adequate resources for long-term growth and development,.

Policies, programmes and reforms to attract FDI to Nigeria have been pursued by various governments. These Policies, programmes and reforms include the deregulation of the economy in 1986 (SAP) following the structural adjustment programmes, the new industrial policy of 1989, the signing of Bilateral Investment Treaties (BITs) in the late 1990s, the establishment of the Nigeria Investment Promotion Commission (NIPC) in early 1990s, the establishment of the Nigeria Investment Promotion Commission (NIPC) in early 1990s, the establishment of the Independent Corrupt Practices and other related offences Commission (ICPC) and the Economic and Financial Crime Commission (EFCC) (Egwaikhide and Ohwofasa, 2011). Due to high population and abundant human capital in Nigeria which can be harnessed if the needed financial resources to employ the human capital are made available. This suggests the reason why analysts and experts in Nigeria assert that FDI can be used as a veritable tool to kick-start the economy. FDI is therefore not just the transfer of technology, capital, labour and ownership from domestic economy to foreign countries but a means for improving business ethics, corporate governance and transparency in an organization.

Qi, (2007) argued that the reason behind offering special incentives to attract foreign direct investment is based on the understanding that it promotes growth not only directly by enhancing fixed capital formation in the recipient countries, but indirectly by assisting in improving the development of human capital, technology transfer, strengthening competition and developing local industries. The area in the economics of development that have attracted much attention that is subject to varying interpretations is the issue that relate to benefits and costs of foreign direct investment especially in a developing economy. The argument is not so much on the effect of multinational corporations (MNCs) on traditional economic aggregates such as gross domestic product, investment and savings but on the fundamental issues of cost and revenue motives as it relates to the diverse activities of multinational corporations with respect to its character and nature of operation for a sustained economic growth and development.

Empirical works on the effect of FDI on the Nigerian economy were mostly centered on aggregate data source, but the impact of FDI on economic growth at the sectoral and perhaps at the micro-economic levels have not been researched upon. This research is therefore, designed to capture the disaggregated impact of FDI on the real sectors of the Nigerian economy to give a better understanding of how FDI in the real sectors has contributed to economic growth process in Nigeria. The sectors in an economy interact and the interactions create multiplier effects and externalities which are transmitted to the economy via FDI. The impact of FDI on the Nigerian economy may not be properly estimated and stated if the multiplier effects and externalities are not entrenched in the estimation process which may lead to biased and faulty results (Onakoya, 2012).The aim of this study is therefore to disaggregate the sectors and examine the effect of FDI on the real sectors of the economy in order to avoid biases.

The study is subdivided into five sections. First is introduction. Section two presents the concept adopted in the study and a review of related empirical works. The methodology and model specification of the research is detailed in section three, while section four presents the results of the research and discusses extensively on them. Section five summarizes the study, provides concluding remarks and offers workable recommendations.

Literature/Theoretical Underpinning

Conceptual Framework

According to Shiro (2007), FDI consists of external resources, technology, capital, managerial and marketing expertise which exerts considerable effect on host country's productivity. He argues that at both micro and macro economy, government's policies can only succeed in stimulating the productive

base of the economy if it has the capacity to attract adequate amount of foreign direct investments comprising of managerial, capital and technological resources that will boost the existing infrastructure and domestic production facilities in the economy.

Foreign direct investment, constitute a major component of international capital flows to many nations especially the developing countries. FDI refers to investment by multinational corporations with head office in the home country usually in the developed countries. According to Oyeranti, (2003) the Organization for Economic Cooperation and Development (OECD) defined FDI as net financing by a business organization in a developed country with the aim of retaining a lasting interest in the organizations host economy. First, this definition stands if only we assume that FDI flows from the developed countries to developing countries otherwise it may be invalid because FDI could as well flow from developing to developed countries. Second, that the investor has a significant control on the administration and management of the organization. Multinational corporations and conglomerates make the overwhelming percentage of foreign direct investment which comprises of fixtures, machinery, equipment and buildings. The increased use of mobile network and social media technology, have loosening effect on imposition of restrictions on foreign direct investment in many markets since lower communication costs means that newer, non-traditional forms of investment now determine the direction of foreign direct investment.

Many governments, whether developed or developing, are kin to foreign direct investment because of the believe, that it may fast track the growth process and lead to sustainable growth and development of their economies (Asiedu, 2009). In recent times, the direction and focus on foreign direct investment patterns has changed towards technology start-ups and with dramatic increase in telecommunication facilities. Many of these high tech start-ups are small business enterprises that have grown into corporate organisations often affiliated with major universities and with some government sponsored programmes. These start-ups unlike traditional FDIs do not require huge capital investments in plants and immense warehouses to store inventory (Asiedu, 2004). It is also important to consider the space requirement for most foreign direct investment undertaken by MNCs. Most start- ups require small structures and can be housed almost anywhere and therefore does not require huge amount spent on machinery, plants, fixtures and fittings. Large enterprises however still play prominent role through foreign direct investment activities by providing technical services to start-ups and small existing businesses in the area of technology (Andreas, 2007). The small business units on the other hand provide services to the larger companies through outsourcing because MNCs are no longer interested in acquiring smaller companies outright due to the risk associated with such high tech ventures. The MNCs get closer to its foreign market or circumvent some trade restrictions by establishing subsidiary companies in the host country.

Generally, there are two broad categories of foreign investments namely official (public) and private foreign portfolio investments. The public foreign investments agreement is usually undertaken at the bilateral and multilateral arrangements. The former refers to investment agreements between two countries via direct government to government transfers, while the private foreign portfolio investments is the investments originating from international financial organizations like the IMF and the World Bank (Okafor, 2012). Public or official capital flows are basically undertaken to satisfy the strategic need and political interest of the government (Iyoha, 2001). The private capital flows are of three types; the foreign direct investment, the portfolio direct investment and the short-term capital flows which include bank credit and commercial bond (Okafor, 2012). FDI is not just the international transfer of capital but a distinctive feature of multinational corporations which involves the establishment of a subsidiary or strategic business unit in a host country. This creates the need for the flow of capital, technology and entrepreneurial skills to the host country. These factors will interact with local factors of production to increases economic activities and enhance efficient production of goods and services for the domestic and export market and hence lead to economic growth.

Theoretical underpinning

According to Althukorala (2003), FDI provides the much needed resources to developing countries such as capital, technology, managerial skills, entrepreneurial skills, and opens access to foreign markets

which are essential for developing countries to integrate with the world economy in order to industrialize, create jobs for its teaming population and reduce poverty. Most developing countries have recognized the importance of FDI in their growth process by liberalizing their economy and encouraging investment export promotion programmes to attract direct foreign investment into their country.

Oyejide, (2005) opinioned, that two theories are usually put forward to explain the course of foreign direct investment. These are the theory of push and the theory of pull factors. The push factor theory emphasized that the increase in foreign direct investment by the MNCs is as a result of increasing tax burden on MNCs in their home countries and due in part to domestic developments such as sound policies and strong economic performance for private portfolio investments in the host economy. The pull factor theorist believe that the cause of the surge in capital flows across national border is due to autonomous increase in the demand for money locally, improvement in monetary and fiscal policies of the recipient country, economic integration, domestic capital markets reforms in line with the global capital markets standards, improvement in foreign debt relations and technology transfers and spillovers.

According to Carkovic and Levine (2002) the economic benefits for offering special incentives to attract MNCs to set up strategic business units is derived from the belief that foreign direct investments produce externalities in the form of technology transfers and spillovers. Other benefits of FDI according to Dauda (2007) include increase in the GDP and generation of stream of incomes in the host economy. This leads to increase in economic activities and hence productivity. The increased productivity benefits local income groups through provision of employment and higher wages, lower product prices, rent to local resource owners and landlords, and high tax revenue or royalties to the government. The increased production leads to expansion and internationalization into foreign markets thereby increasing foreign exchange earnings for host countries. FDI will in the long run contribute to economic growth in developing countries as it rejuvenates in the host country's thereby making significant contributions to the development process by increasing incomes and easing of the constraints of low levels of domestic savings which will increase domestic investment as well as reduce foreign exchange shortages.

Review of Related Empirical Literature

Literature on the impact of FDI on economic growth over the years shows conflicting results. Empirical evidence on FDI–economic growth nexus therefore remains inconclusive.

Olasunkanmi (2015) investigation on the impact of Foreign Direct Investment (FDI) on economic growth in Nigeria through the use of annual secondary data from 1981 to 2013 collected from the World Bank's Africa Development Indicators shows that FDI positively contributes to economic growth in Nigeria, but not statistically significant at the 5% level of significance. While, Gross Fixed Capital Formation (GFCF) has a positive and statistical significant contribution to Nigeria's economic growth.

Anyanwu, Aiyedogbon and Ohwofasa (2015), carried out a sectoral analysis of the impact of FDI on economic growth. The study examined the agricultural, manufacturing, mining and telecommunication sectors from 1980-2011. Findings of the research reveal that agriculture and manufacturing sectors have negative impact on economic growth in the long run while mining and telecom sectors had positive effect on the economy. The short run results reveal that FDI in agricultural sector has no impact on economic growth while the impact of manufacturing sector impact on economic growth was negative. Mining and telecommunication sectors however revealed positive impact in the short run.

Odili(2015) examined the causal relationship between exchange rate movement, economic growth and foreign direct investment in Nigeria from 1980 to 2014. The study employed ADF unit root, co-integration and the Granger Causality tests in the analysis. It provides empirical illustration of the nature of the relationship that result when exchange rate volatility and economic growth act on foreign direct investment based pair-wise Granger causality test. The study reveals that there exist a unidirectional causal relationship from exchange rate volatility to foreign direct investment and that bidirectional causality exists between economic growth and foreign direct investment in Nigeria.

Ogueze and Odim (2015) examined thesignificant effect of foreign direct investment (FDI) on the economy of Nigeria and empirically analyzed causal relationship between economic growth and FDI. The study employed two stages leastsquares (2SLS) estimation technique to ascertain relationshipbetween the specified variables in the models. The co-integration test carried out

revealedthat there is positive long-run equilibrium relationship between FDI and economic growth in Nigeria.

Asogwa and Osondu (2014) researched on the impact of FDI on the growth of Nigerin economy using quarterly data covering the period 1980Q1 - 2009Q4. The study employed endogenous growth model with emphases on agriculture, manufacturing and telecommunication sectors in Nigeria. The study also investigated the causal flow between FDI inflow into these sectors and economic growth. It also looked at the effect of environment factors- political instability (PI), corruption, institution/legal framework and macroeconomic indicators such as inflation, real interest rate and real exchange rate on the inflow of FDI. The results revealed that FDI into manufacturing and telecommunication sectors have positive impact on economic growth in Nigeria while FDI into agricultural sector has negative impacted on economic growth. The granger causality tests revealed that FDI into agriculture, manufacturing and telecommunication sectors have a unidirectional relationship with economic growth in Nigeria. Institution or legal framework has positive and significant effect on FDI in Nigeria. Political instability and real exchange rate have significant and negative effects on FDI in Nigeria.

Saibu and Keke (2014) in their research on the impact of Foreign Private Investment on economic growth used annual time series data from Nigerian economy. The study made use of co-integration and Error Correction Method (ECM) to analyze the data. The findings revealed that feedback of 116% and 78% from previous disequilibria between long-run economic growth and foreign private investment respectively were recorded. The results also indicated that only about 22% of net capital inflows were invested leaving a substantial proportion of capital inflow not productively invested. The environment factors were found to be unfavorable and overwhelmed the positive impact of foreign private investment in Nigeria.

Ndem, Okoronkwo and Nwamuo (2014) examined the factors that determine foreign direct investment and their impact in Nigeria from 1975 – 2010. They specifically selected exchange rate, market size(GDP), investment in infrastructure, openness and political risks from 1975 – 2010 as the determinants. The data were analyzed using Ordinary Least Square (OLS), and co-integration Error Correction Method(ECM). The result revealed that Market Size (GDP), openness, and exchange rate influenced FDI inflow while political risk had negative effect on FDI. Investment in infrastructure had positive impact but was not significant to influence FDI inflow into the country.

Ikpa and Atsu (2014) investigated the functional relationships that exist between GDP, wage rate, interest rate and relative openness index as determinants of Foreign Direct Investment (FDI) in Nigeria from 1980 – 2011. The study revealed that FDI inflow into Nigeria has significant relationship with GDP and real wage rates, while there was no relationship between FDI in flow and the relative openness index as well as lending rate in Nigeria.

Olayemi (2014) studied the effect of Foreign Private Investment, Capital Formation on Poverty reduction in Nigeria, using annual time series data covering the period between 1978 and2008. Co-integration, Error correction Mechanism (ECM) and Granger Causality tests were employed in the analysis. The result of the analysis revealed foreign Private Investment in Nigeria has no impact on poverty alleviation in Nigeria. The study also shows that federal government expenditure on health and education has no significant effect on poverty reduction in Nigeria.

Olusanya (2013) examined the impact of Foreign Direct Investment on economic growth in a pre and post deregulated periods in Nigeria adopting Granger causality estimation technique from 1970 - 2010. The analysis disaggregated the economy into three period; 1970 to 1986, 1986 to 2010 and 1970 to 2010. The findings show that there is causal flow in the pre-deregulation era that is (1970-1986) from economic growth to foreign direct investment which indicates GDP causes FDI, but there is no causal relationship in the post-deregulation era that is (1986-2010) between economic growth and foreign direct investment which implies GDP causes FDI. The result however revealed bidirectional causal relationship between economic growth and foreign direct investment which means that economic growth drive foreign direct investment inflow into the country and vice versa from 1970 to 2010.

Oba and Onuoha (2013) studied the determinants of foreign direct investment and their impact on the Nigerian economy covering a period of ten years (2001 -2010). The determinants considered are real GDP, inflationary levels, openness of trade, electricity consumption, transport and communication. The

results revealed that the real GDP, inflation and electricity consumption had negative effect on the economy.

Alege and Ogundipe (2013) employed the System-GMM panel estimation technique in investigating the relationship between foreign direct investment and economic growth in ECOWAS from 1970-2011. The System-GMM corrects the weaknesses inherent previous empirical studies majority of which failed to control for the presumed problems of endogeneity that exits in the FDI-Growth argument. In the study human capital and institutions were the key indicators explaining the changes in FDI. The results of the analysis revealed that FDI has negative but insignificant effect on growth of the sub region which appears to contradict earlier studies.

Onakoya (2012) formulated a structural macro econometric model of simultaneous equations consisting of four blocks made up of supply, private demand, government and external factors to capture the inter-linkages amongst the sectors and analyse the disaggregated impact of FDI on the different sectors of the economy. The finding revealed that FDI has significant effect on output growth of the economy but the magnitude differs across sectors.

Egwaikhide and Ohwofasa (2011) used co-integration and vector error correction model to examine the relationship between FDI and economic growth in Nigeria from 1980-2009. FDI was disaggregated into oil and non-oil components. The result of the study shows that the impact of the disaggregated FDI on real sectors agriculture, mining, manufacturing and petroleum was not significant with the exception of the telecom sector which has significant effect on the economy of Nigeria especially in the long run.

Ullah, et al., (2011) developed simultaneous models to capture the joint effects of FDI on agriculture and industrial sectors of Pakistan economy for the period 1979 to 2009. 2SLS technique was used in the model estimation. The study found significant negative impact of FDI on growth of agricultural sector while FDI positively influenced the industrial sector but the impact is found to be statistically insignificant. The study also revealed that the terms of trade, growth of service sector and growth of real GDP has significant positive impact on growth rate of industrial sector in Pakistan.

Bello and Adeniyi (2010) used the Autoregressive Distributed Lag (ARDL) approach to investigation the causal relationship among FDI determinants, economic growth and environment by applying the annual time series data for the period spanning 1970-2006. The finding reveals that there is no long run relationship between FDI and growth but there exists, long run causal flow between environmental quality and FDI inflows.

Chakraborty and Nunnenkamp (2008) studied industry-specific FDI and output data to granger causality tests within a panel co-integration framework. The result shows that growth impact of FDI vary extensively across the various sectors. It further revealed that no causal relationship exists between the primary sector and FDI and output in the services sector, while FDI and output were found to be mutually reinforcing in the manufacturing sector. In the services sector however, FDI appears to enhance rapid growth in the manufacturing sector via sectoral spillovers and externalities.

Türkcan, Duman, and Yetkiner (2008) analysed the endogenous relationship between economic growth and FDI using a panel data set for 23 OECD countries for the period 1975-2004. The study estimated a two-equation simultaneous equation system with the generalized methods of moments (GMM). The result shows that FDI and growth are important determinants of each other and that export growth rate is a statistically significant determinant of economic growth and FDI.

Basu and Guariglia, (2007) used Generalized Methods of Moments (GMM) to analyse the effect of Foreign Direct Investment on Inequality and the economy with a sample of 119 developing countries for the period of 1970 – 1999. The study revealed that foreign direct investments enhanced both educational inequalities and economic growth in developing countries but has a reducing impact on the share of agricultural sector in gross domestic product.

Johnson (2006) investigated the impact of foreign direct investments on economic growth using a sample of 90 developed and developing countries from 1980 – 2002. The ordinary least squares (OLS) methodology was employed in the analyses. The study revealed that foreign direct investment inflows caused rapid economic growth in developing countries. But its effect in developed countries was not significant.

Hyun, (2006), examined the effect FDI on economic growth using a sample of 59 developing countries for the period of 1984 – 1995. The estimation method adopted in the analyses was the ordinary least squares (OLS). The study found that foreign direct investments had positive and significant effect on economic growth, but the lagged values of FDI foreign when regressed on economic growth had no positive effects on current economic growth of the countries investigated.

Li and Liu (2005) analysed the impact of foreign direct investments on economic growth using a sample used 21 developed countries and 63 developing countries from 1970 – 1999. The ordinary least squares (OLS) estimation technique was employed after testing for stationarity of the variables. The study revealed that endogenous relationship between foreign direct investment (FDI) and economic growth accelerated from the middle of 1980s. It further shows that foreign direct investments, human capital development and technological advancement have positive and significant impact on economic growth in developing countries.

Methodology

Model Specification

The model developed and employed in this study is based on the empirical methodology of Egwaikhide and Ohwofasa (2011), Onakoya (2012) and Anyanwu, Aiyedogbon and Ohwofasa (2015) with some modifications. This study separated mining activities into two components, solid minerals and oil (Petroleum Resources) and also included FDI in electricity and construction sectors in the model because they constitute the real sectors that attract foreign capital inflow in Nigeria. The functional form and general specification of the model using a linear approach is thus presented below:

GDP = f (FAG, FMAN, FSMN, FTEL, FPET, FPOW, FCON) ----------Eqn. (1)

$GDP_t = a_o + b_1FAG_t + b_2FMAN_t + b_3FSMN_t + b_4FTEL_t + b_5FPET_t + b_6FPOW + b_7FCON_T + \mu_t$ ---------- Eqn. (2)

In log stochastic term, equation (2) can be written as:

$InGDP_t = a_o + b_1InFAG_t + b_2InFMAN_t + b_3InFSMN_t + b_4InFTEL_t + b_5InFPET_t + b_6InFPOW_t + b_7InFCON_T + \mu_t$ ----------Eqn. (3)Where,

GDP = Real Gross Domestic Product
FAG = Foreign Direct Investment in Agriculture
FMAN = Foreign Direct Investment in Manufacturing
FSMN = Foreign Direct Investment in Solid Minerals
FTEL = Foreign Direct Investment in Telecommunication
FPET = Foreign Direct Investment in Petroleum Resources
FPOW = Foreign Direct Investment in Power
FCON = Foreign Direct Investment in Construction
t = time trend
u = error term
a_0 = constant
$b_1 – b_7$ = parameters to be estimated

The *a priori* expectation based on economic principles is that the signs of the parameters (FAG, FMAN, FSMN, FTEL, FPET, FPOW and FCON) are expected to be positive. All the variables are in their log form. The long term effect and the short run dynamics of this model were estimated. Data for this study were collected mainly from secondary sources which include the Central Bank of Nigeria's Statistical Bulletin (various issues) and National Bureau of Statistics. For this study disaggregated real sector annual data were employed because of unavailability of monthly and quarterly data in Nigeria. In addition, aggregate data are particularly very useful in establishing long run econometric effect and relationship between variables (Hoover, 2014). The choice of the study period covering 1986 to 2014 is to capture the period following the deregulation of the Nigerian economy and the adoption of the IMF proposed structural adjustment programme (SAP) in Nigeria, which provides an opportunity for a comprehensive assessment of the effect of FDI on deregulated Nigerian economy.

Results/Findings

Unit Root Test.

The data collected for this study were tested for stationarity using the standard Augmented Dickey-Fuller (ADF) unit root tests at the levels and at first difference (for both constant without trend and constant with trend). The tests were conducted using E-views 8.0 statistical software which has the advantage of automatically selecting the appropriate number of lagged dependent variables and hence corrects for the presence of serial correlation (Asteriou and Hall, 2007). The result is presented in Table 1 below.

Table 1: The Results of Augmented Dickey-Fuller (ADF) Test.

	Level		First Difference	
Variables	Constant without Trend	Constant with Trend	Constant without trend	Constant with trend
InGDP	-0.84610	-1.10967	-4.01576**	-4.38023***
InFAG	-0.66915	-0.63259	-4.16972**	-4.12763**
InFMAN	-0.53412	-2.72039	-3.76824**	-3.86152**
InFSMN	-3.27520*	-3.24528*	-5.34205***	-5.82165***
InFTEL	-2.18517	-3.23812*	-4.91304***	-5.34482***
InFPET	-1.60324	-0.87416	-3.69836**	-3.75418**
InFPOW	-0.32148	-0.20987	-3.64167**	-4.01420**
InFCON	-0.70679	-1.18923	-3.60325**	-3.81755**
Critical Value	Level		First Difference	
1%	-4.25301		-4.36328	
5%	-3.57436		-3.59354	
10%	-3.23148		-3.24308	

Source: Author's Computations, 2015 from e-views results.

Note: Asterisks ***,**,* denote statistical significant at 1%, 5% and 10%, respectively. Lags were automatically selected based on SIC, maximum lag=8.

The result of Augmented Dickey-Fuller (ADF) unit root test presented in Table 1, shows that the variables were not stationary at levels even though FSMN and FTEL were marginally significant at 10% level of significance. However, the tests revealed consistent results by rejecting the null hypothesis (HO) of unit root at first difference, against the one-sided alternative whenever the ADF statistic is less than the critical value at statistically significant levels of 1%, 5%, and 10%. Hence, the study concludes that the series is stationary at first difference. This implies that the mean and standard deviation do not systematically differ over a period of time.

Co-integration Test

The study used the maximum likelihood test procedure suggested by Johansen and Juseluis (1990) to test for the existence or otherwise of long-run equilibrium between the series in the model. The study carried out both trace and maximum eigenvalue tests. The trace test ($\boldsymbol{\lambda}$ trace) is a test of the null hypothesis that the number of distinct co-integrating vector is less than or equal to q against a general unrestricted alternatives q= r, this test is shown in the equation below.

$$\lambda\, trace\ (r) = \ -T\sum_{i=r+1}^{n} In(1-\lambda t) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Eqn.(4)$$

Where: T is the number of usable observations, and $\boldsymbol{\lambda}$t' is the estimated eigenvalue from the matrix. The maximum eigenvalue test ($\boldsymbol{\lambda}$ max) concerns a test of the null hypothesis that there is r co-integrating vector against the alternative of r+1 co-integrating vectors. It is calculated according to the following formula:

$$\lambda \max(r, r+1) = -T\, In(1 - \lambda r + 1) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots Eqn.\ (5)$$

The test results are presented in Table 2 and 3, respectively.

Table 2: Johansen co- integration test results (trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.998762	536.5627	159.5297	0.0000
At most 1 *	0.995870	355.8164	125.6154	0.0000
At most 2 *	0.957703	207.6022	95.75366	0.0000
At most 3 *	0.813838	122.2002	69.81889	0.0000
At most 4 *	0.722191	76.80947	47.85613	0.0000
At most 5 *	0.657287	42.22733	29.79707	0.0011
At most 6	0.365503	13.31408	15.49471	0.1038
At most 7	0.037471	1.031152	3.841466	0.3099

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Table 3: Johansen Cointegration Test Result (max-eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.998762	180.7463	52.36261	0.0000
At most 1 *	0.995870	148.2142	46.23142	0.0000
At most 2 *	0.957703	85.40199	40.07757	0.0000
At most 3 *	0.813838	45.39072	33.87687	0.0014
At most 4 *	0.722191	34.58215	27.58434	0.0054
At most 5 *	0.657287	28.91325	21.13162	0.0033
At most 6	0.365503	12.28292	14.26460	0.1005
At most 7	0.037471	1.031152	3.841466	0.3099

Max-eigenvalue test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

The co-integration test results reveals that there are co-integrating vectors in the model, with trace and maximum Eigen value tests giving six (6) co-integrating equations at 5% level of significance. Since at least a co-integrating equation is established in both the trace and max-eigen value, the study concludes that long run relationship exists between GDP and FDI variables and that the variables have been interacting over time. The result of the long run static regression normalized on GDP is presented in Table 4 below.

Table 4: Long-run relationship

Variable	Coefficient	Std. Error	t-Statistic	Prob.

LNGDP(-1)	0.62035	0.23481	2.64192	0.0138
LNFAG(-1)	0.22345	0.05860	3.81305	0.0025
LNFMAN(-1)	0.27411	0.06206	4.41678	0.0012
LNFSMN(-1)	0.01963	0.01222	1.60613	0.1644
LNFTEL(-1)	0.15284	0.04340	3.52167	0.0036
LNFPET(-1)	0.35690	0.06018	5.93046	0.0001
LNFPOW(-1)	0.12066	0.15740	0.76656	0.0810
LNFCON(-1)	0.08084	0.03169	2.55104	0.0148

Source: Researcher's Computations 2015 using E-views 8.0 package.

Short Run Error Correction Model

The dynamic version of the long run model was specified with the residuals from the co integration regression as error correction model (ECM). The error correction model is stated as follows:

$$\Delta InGDPt = a_0 + \sum_{k=1}^{n_1} b_1 \Delta InGDP_{t-k} + \sum_{k=1}^{n_2} b_2 \Delta InFAG_{t-k} + \sum_{k=1}^{n_3} b_3 \Delta InFMAN_{t-k} + \sum_{k=1}^{n_4} b_4 \Delta InFSMN_{t-k} + \sum_{k=1}^{n_5} b_5 \Delta InFTEL_{t-k} + \sum_{k=1}^{n_6} b_6 \Delta InFPET_{t-k} + \sum_{k=1}^{n_7} b_7 \Delta InFPOW_{t-k} + \sum_{k=1}^{n_8} b_8 \Delta InFCON_{t-k} + \lambda ECM_{t-1}$$ ----------Eqn. (6)

The estimated result of the error correction model is presented in Table 5 below:

Table 5: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.03748	0.01667	2.24701	0.0465
D(LNGDP(-1))	0.18059	0.06481	2.78645	0.0237
D(LNFAG(-1)	0.06221	0.06139	1.01328	0.0735
D(LNFMAN(-1))	0.21820	0.10195	2.14027	0.0378
D(LNFSMN(-1))	0.03933	0.11792	0.33350	0.3652
D(LNFTEL(-1))	0.29162	0.10216	2.85453	0.0162
D(LNFPET(-1))	0.42856	0.09152	4.68267	0.0003
D(LNFPOW(-1))	0.04358	0.05848	0.74536	0.2479
D(LNFCON(-1))	0.20154	0.19912	1.01214	0.0867
ECM(-1)	-0.16117	0.05630	-2.86263	0.0214

R^2 =0.813014
F-Statistic = 82.6423
DW =2.01651

Source: Researcher's Computations 2015 using E-views 8.0 package.

Discussion

The regression analysis result of the long run estimation of the impact of FDI in real sectors on economic growth in Nigeria is presented in Table 4. The long-run gross domestic product was driven by increase in the level of foreign direct investment in Nigeria. The result revealed that an increase by one percent in FAG, FMAN, FTEL, FPET, and FCON would lead to about 22.35, 27.41, 15.28, 35.69, and 8.08 percent increase in gross domestic product respectively. The variables were statistically significant at 5 percent level of significance. This is in line with the research findings of Anyanwu, Aiyedogbon and Ohwofasa (2015) in which FAG, FMAN, FMIN and FTEL had significant effect on the economy of Nigeria but with FAG and FMAN exerting negative significant impact in the long run. Ogueze and Odim (2015) also found that FDI has significant impact on economic growth in Nigeria. This result is however not in agreement with the research results of Akinlo (2004), Onu (2012) and Olasunkanmi (2015) in which it was found that FDI though positively contributed to GDP in Nigeria was not statistically significant. The other explanatory variables FSMN and FPOW were positive but not significant in the long run. Based on the analysis of the results, FAG, FMAN, FTEL, FPET and FCON proved to exert more effect on economic growth in Nigeria.

Table 5, presents the short run dynamics of variables under investigation. Based on the coefficient of the estimates, the equation of the ECM is specified in line with the parsimonious model as follows:

$$GDP_{t-1} = 0.03748 + 0.18059GDP_{t-1} + 0.06221FAG_{t-1} + 0.21820FMAN_{t-1} + 0.03933FSMN_{t-1} - 0.29162FTEL_{t-1} + 0.42856FPET_{t-1} + 0.04358FPOW_{t-1} + 0.20154FCON_{t-1} - 0.16117ECM_{t-1} - -Eqn.(5)$$

The equation above shows an ECM value of -0.16117 which is otherwise referred to as the speed of adjustment. The speed of adjustment is statistically significant at 5%, considering its probability value of 0.0214. It is also correctly signed with a negative sign which implies that about 16% of the short run disequilibrium and inconsistencies between the short and the long run are being corrected and adjusted into the long-run equilibrium path within a year. The results stated table 5, are the parsimonious model and they indicated that in the short run FMAN, FTEL and FPET have positive and significant impact on economic growth in Nigeria. On the contrary, FAG, FSMN, FPOW, and FCON have positive but insignificant impact on economic growth in Nigeria. This implies that for a 1% increase in the level of FMAN, FTEL and FPET, economic growth will increase by about 21.82, 29.16 and 42.86 percent respectively. Thus, unlike the long run, the short run results do not provide much support for the contribution of foreign direct investment in real sector to economic growth in Nigeria since FAG, FSMN, FPOW and FCON were not significant. Anyanwu, Aiyedogbon and Ohwofasa (2015), Egwaikhide and Ohwofasa (2011), Onakoya (2012) had earlier reached similar findings. The positive constant shows that if the explanatory variables are held constant, economic growth will be positive to the tune of 3.7 percent which is attributed to the variables not included in the model.

Table 5 further reveal that the DW of 2.01651 shows absence of serial autocorrelation while the R^2 value of 0.813014 shows that the explanatory variables can about explain about 81.3 percent of the changes in GDP in Nigeria within the period under investigation and hence, the estimated model is reliable for making predictions and inferences.

Research Implications for Policy Makers

In the light of the research findings, it is important to remark that policy shocks to FDI especially the non-oil sector, such as agriculture, solid minerals and power in Nigeria do not show immediate response in the desired direction in terms of output and contribution to economic growth in Nigeria. Policy makers need to be conscious of this lag in order to ensure appropriateness in the timing of policies in this regard. This study therefore recommends long term planning and policies that will encourage foreign direct investment in non-oil sector such as agriculture, manufacturing, solid minerals and power to boost economic activities and increase output level in Nigeria. The study further recommend, policies that will provide public-private risk mitigating instruments and assist public providers of infrastructural facilities

to attract foreign investors and encourage FDI into the country. The removal of government induced distortions and provision of enabling business climate for foreign investors to operate is imperative.
On a general note, political risk, insecurity, corruption and capital flight prevalent in most developing countries like Nigeria are the main reason for low level of FDI inflow into the country. Policies that will reduce political risk, curb corruption and capital flight, stem insecurity, ensure property rights and policies that will ensure full integration of the Nigerian economy into the world economy will assist attract FDI and improve economic growth in Nigeria.

Conclusion

The study empirically investigated the impact of foreign direct investment in real sectors of the Nigerian economy on economic growth from 1986 to 2014. The sectors examined are Agriculture, Manufacturing, Solid minerals, Telecommunication, Petroleum resources, Power and Construction. The study tested the time series data for stationarity by means of the Augmented Dickey Fuller unit root test. Having found that the series was stationary at first difference, the study conducted co-integration test to determine the existence of long run relationship of the variables in the model and error correction mechanism was employed in examining the short run dynamics of the variables using the E-views 8.0 software.
The result revealed that FAG, FMAN, FTEL, FPET, and FCON were statistically significant at 5 percent level of significance but with FAG and FMAN exerting negative significant impact in the long run. FSMN and FPOW were positive but not significant in the long run.
The results further show that in the short run FMAN, FTEL and FPET have positive and significant impact, while FAG, FSMN, FPOW, and FCON have positive but insignificant impact on economic growth in Nigeria. Foreign direct investment in real sector therefore has the potency of driving the Nigerian economy towards achieving a sustainable economic growth.

Limitations/Suggestion for Future Studies

The study is limited in scope to the real sector of the Nigerian economy as it examined the impact of foreign direct investment (FDI) in real sector on economic growth in Nigeria. It is also limited to the period spanning 1986 to capture the period following the deregulation of the economy and the adoption of the IMF proposed structural adjustment programme (SAP) in Nigeria, which provides an opportunity for a comprehensive assessment of the effect of FDI on deregulated Nigerian economy.
The study employed the use of co-integration and error correction mechanism in estimating the impact of FDI inflow to the chosen sectors on Nigerian economic growth. For further studies, investigations on FDI inflow to other sectors such services and education could be looked into. It suggests other estimation technique such as auto-regressive distributed lag (ARDL) bounds testing approach should be tried since different method of estimation may yield slightly varying results.

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