

Foreign Direct Investment and Economic Growth: Evidence from Nigeria

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Abstract

This paper empirically examines the effects of Foreign Direct Investment (FDI) on economic growth in Nigeria. Employing the Error Correction Model (ECM), annual secondary time series data covering the period of 1979 to 2013 were analysed using an ECM technique to determine the short and long run effect of FDI on economic growth of Nigeria. Granger causality methodology was used to analyze and establish the nature of relationship (if any) between FDI and economic growth in Nigeria. Our empirical analysis reveals that Foreign Direct Investment (FDI) has both immediate and time lag effect on Nigeria economy in the short run. And FDI has a non significant negative effect on the Nigerian economy in the long run during the period under review. This was further confirmed by the causality test which shows that FDI granger causes RGDP and not the other way. Thus FDI has a significant positive effect on the growth as well as the development of the Nigerian economy only in the short run during the period under review. We therefore conclude and recommend that government should ensure stable macroeconomic policies as a stabilization tool to propel the attraction of more FDI into Nigeria and dependency on foreign direct investment should remain limited.

Keywords: FDI, economic growth, ECM, granger causality, domestic investment.

1. Introduction

One of the benchmark remedy for economic underdevelopment in the economic development literature is Foreign Direct Investment (FDI). Government authorities have been attempting to raise their country's economy out of economic stagnation in developing countries like Nigeria without achieving desired success. These governments in developing countries have not minded much attention on investment specifically foreign direct investment which will not only enhance employment but will also influence positively on economic growth and development. FDI is essential to trim down the disparity amid the desired gross domestic investment and domestic savings. Jenkin and Thomas (2002) opined that Foreign Direct Investment (FDI) is expected to contribute to economic growth not only by providing foreign capital but also by crowding in additional domestic investment. By promoting both forward and backward linkages with the domestic economy, additional employment is indirectly created and further economic activity stimulated. Adegbite and Ayadi (2010) postulated that FDI helps the domestic revenue-generation gap in a developing economy, given that most developing countries' governments do not seem to be able to generate sufficient revenue to meet their expenditure needs. Other benefits are in the form of externalities and the adoption of foreign technology.

Amidst the common applications of Foreign Direct Investment (FDI) is the establishment of new companies in high-profit business areas or the purchase of an already existing company in the foreign country. In such investments, the management and the control of such investments are mostly carried out by foreigners.

According to some proponents of Foreign Direct investment in early 1980s like (Lall, 1983), the higher the amount of foreign investment a country can attract the bigger portion it can take from global production and income, therefore; its national wealth can increase (Guraks, 2003). Thereby FDI can stimulate the additional resources to break the vicious circle and act as a complementary tool for domestic resources, thus, the relevance of FDI is felt through compensation mechanism in breaking the vicious circle of poverty (Nurkse, 1953). However, Boyd and Smith (1992), Wheeler and Mody (1992) argued to the contrary. According to them, FDI can affect resource allocation and growth negatively where there are price distortions, financial, trade and other forms of distortions existing prior to FDI injections. Nunnenkamp and Spatz (2003) also criticized the view that developing countries should draw on FDI to create economic development. Furthermore, FDI can bring about "Crowding out" which is a scenario where parent companies dominate local markets, thereby stifling local competition and entrepreneurship as a result of "policy chilling" or "regulatory arbitrage" (ECOSOC 2000).

Studies on FDI-growth issues in Nigeria include Oyejide (2005) which provided conceptual framework for the analysis of the macroeconomic effects of volatile capital flows. And some researchers like Uwubanmwun and Ajao, (2012), Balasubramanyam, Salisu and Sapsford (1996), Otepola (2002) and Ogbekor (2005) asserts that FDI contributes more significantly to economic growth with the aid of other macroeconomic variables like trade openness, domestic investment, human capital, interest rate and financial market development in specific country. FDI has come to swamp all other financial flows (World Development Report, 2000). Developing nations like Nigeria have been encouraged by such benefits, to attract FDI inflows.

In order to determine the existence of Foreign Direct Investment (FDI) benefits on the Nigerian economy, there are conflicting evidence in the literature regarding the question as to how, and to what extent, Foreign Direct Investment (FDI) affects economic growth. Chowdhury and Mavrotas (2005) argue for individual country study which would help in ascertaining the causal links between FDI and economic growth in those countries since it is believed that the link is country specific. The effects of FDI inflow differential and economic growth disparity among emerging economies have created much research interest among economists. Despite considerable number of studies examining the relationship between FDI and economic growth, the effect of FDI on the Nigerian economy remains an unresolved issue. These differences in findings might be attributed to the variant in variables, time frame, estimation techniques and variable measurement techniques employed in these studies (Easterly, 2003). Is also expedient to know why Nigeria has not been able to attract significant FDI all these years.

This study therefore seeks to contribute to filling this gap in knowledge. It is against this background that this study attempt to examine the effect of FDI on economic growth, within the context of the Nigerian economy in concurrence of five other macroeconomic variables including debt, domestic investment, inflation rate, exchange rate and trade openness on the basis of relevance to FDI. This study provides answer to these specific questions answered are: 1) What is the effect of Foreign Direct Investment (FDI) on economic growth in Nigeria? 2) What is the direction of causality between Foreign Direct Investment (FDI) and economic growth in Nigeria? The study is guided by the following specific objectives, these are to; determine the effect of Foreign Direct Investment (FDI) on economic growth in Nigeria. And ascertain the direction of causality between Foreign Direct Investment (FDI) and economic growth in Nigeria.

2. Review of Related Literature

2.1 Conceptual Literature of Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) is one of the most debated topics and core theory of development economics which still keeps its prominent place. Many researchers like Oseghale and Amonkhienan (1987), Odozi (1995), Oyinlola (1995), Adelegan (2000), have presented various theories and numerous empirical evidence nationally and internationally, but the subject matter is still unresolved and open for further discussion. Economic growth can be explained by a variety of social, political, economic and institutional factors. The FDI-Growth nexus has gained importance in growth literature in its varied dimensions. The overview of the studies confirm various dimensions such as fundamental theories of FDI, various macro economic variables that influence FDI, the impact of economic integration on the movements of FDI followed by advantages and disadvantages of FDI (Yusop, 1992; Cheng, 2000; Lim, 2000).

Foreign Direct Investment (FDI) is a key element in international economic integration. FDI creates direct, stable and long-lasting links between economies. It encourages the transfer of technology and know-how between countries, and allows the host economy to promote its products more widely in international markets. FDI is also an additional source of funding for investment and under the right policy environment it can be an important vehicle for development (OECD Factbook, 2012). The term FDI refers to the cross-border investment by a resident entity in one economy with the objective of obtaining a lasting interest in an enterprise resident in another economy. Tadaro, (1999), define FDI as investment by large multinational corporations with headquarters in the developed nations. Amadi (2002) sees it as a distinctive feature of multinational enterprises. According to him, FDI is not simply an international transfer of capital but rather, the extension of enterprise from its home country which according to Root (1984), involves flows of capital, technology and entrepreneurial skills to the host economy where they are combined with local factors in the production of goods for local and for export markets.

Mwilima (2003) describes FDI as investment made to acquire a lasting management interest (usually at least 10% of voting stock) and acquiring at least 10% of equity share in an enterprise operating in a country other than the home country of the investor. FDI has further been explained as the long-term investment reflecting a lasting interest and control, by a foreign direct investor (or parent enterprise), of an enterprise entity resident in an economy other than that of the foreign investor (IMF, 1999). Equally, Mallampally and Sauvart (1999) describe FDI as investment by multinational corporations in foreign countries in order to control assets and manage production activities in those countries. Expanded explanation on the meaning of FDI has been offered by Ayanwale (2007) as ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment. FDI comprises not only merger and acquisition and new investment, but also reinvested earnings and loans and similar capital transfer between parent companies and their affiliates. Ikiara (2003) suggests that foreign firm may allow local firms to appropriate its technology if this guarantees it access into some of the benefits available in the host country such as access to valuable local technology and possibility of receiving commercial advantages. By implication developing countries like Nigeria requires such technical change and technological learning to achieve any meaningful growth.

2.8 Empirical Literature of Foreign Direct Investment and Economic Growth

Hadiji (1995) examines the impact of foreign capital inflows on economic growth in a cross sample of 33 developing countries between 1986 to 1992. The results indicated that foreign capital inflows stimulates growth initially beyond a certain threshold, however, the impact on growth appeared negative. The study concluded that too much foreign capital inflows could retard growth. Ekpo (1995) reports that political regime, real income per capita, rate of inflation, world interest rate, credit rating and debt service explain the variance of FDI in Nigeria. For non-oil FDI, however, Nigeria's credit rating is very important in drawing the needed FDI into the country. While Oyinlola (1995) and Adelegan (2000) find that FDI in Nigeria is pro-consumption and pro-imports and hence negatively related to gross domestic investment, and hence to growth. Mamun and Nath (2005) argued in support of the modernization theory claiming that FDI plays a dual function by contributing to capital accumulation and by increasing total factor productivity. Balasubramanyam, (1996) and De Mello (1997) concluded that FDI has more growth increasing effects in those countries where the labor force is highly educated and which is following export promotion trade policies rather than import substitution trade policies.

Similarly, Campus (2000) investigates the effects of FDI on 25 transitional economies of the former Soviet Block. their data set provides a more informative assessment of FDI as an engine for the diffusion of technology. Their results approximate Borenztein (1998) that FDI is a significant factor in economic growth. Mayer (2000) argues that the direction of causality depends on the recipient country's trade regime. Zhang (2001) report that FDI promotes economic growth in countries where the domestic infrastructure is well developed and trade and FDI policies are more liberal. Ayanwale and Bamire (2001) find a positive relationship between FDI and economic growth in Nigeria. Moreover, (Hanson 2001) has found weak evidence that FDI generates positive spillovers for host countries. Obwona (2001) notes in his study of the determinants of FDI and their impact on growth in Uganda that macroeconomic and political stability and policy consistency are important parameters determining the flow of FDI into Uganda and that FDI affects growth positively but insignificantly. Nair- Reichert and Weinhold (2001) argue that the effect of FDI on growth is highly heterogeneous across countries and this heterogeneity is more pronounced for more open economies. Hayami, (2001) also argues from economic growth potentials of FDI that there is a strong correlation between FDI and standard of living.

Liu, Burrige, and Sinclair (2002), predicted a longitudinal relationship between FDI, trade and the economic growth in China. By using the data for 1981-1997 fiscal years, they found a two-way relationship between FDI, economic growth and import. Wang suggested that manufacturing FDI have positive effect on economic growth and this positive effect is due to spillover effect of FDI (Wang, 2002). Campos and Kinoshita (2002) state that FDI would only have positive effect on economy of the host country if FDI is in the shape of pure technology transfer. De Gregorio (2003), Eke (2003) and Akinlo (2004) in their study found that FDI had positive effect on economic growth. Also Hermes and Lensink (2003), Carcovic and Levine (2003) investigated and concluded that FDI exerts significant negative effect on the host country. Kentor and Boswell (2003), Nunnenkamp and Spatz (2003) and Durham (2004) in their studies uses different estimation techniques and time frame, their studies reveals that FDI had a significant negative effect on economic growth. While Adams (2004) finds from his regression analysis that FDI is not harmful to sub-Saharan African (SSA) countries, thus, contributing to the living standard of its citizenry.

Another strand of the literature has focused more directly on the causal relationships between FDI and growth. For example, Chowdhury & Mavrotas (2006) examine the causal relationship between FDI and economic growth. Their empirical findings clearly suggest that GDP causes FDI in the case of Chile and not vice versa, while for both Malaysia and Thailand, there is strong evidence of a bi-directional causality between the two variables. Furthermore, in (Hansen & Rand 2006), the causal relationship between FDI and GDP is analysed in a sample of 31 developing countries covering the period 1970-2000. Their conclusions regarding the direction of causation between the two variables seem to vary significantly depending on the econometric approach adopted and the sample used. One of the studies on this issue was conducted by Fosu and Magnus (2006) examined the causality between FDI and economic growth in Ghana for two different periods (1970-1983 and 1984-2002) produced conflicting results for the periods mentioned.

With precise citation to Nigeria, studies on the impact of FDI on growth have also emerged with mixed outcome. Dauda (2007), Ayanwale (2007) and Dutse (2008) find a positive relationship between FDI and economic growth in Nigeria in the era of liberal trade policy and export promotion. Tan, Selvanathan and Selvanathan (2008) explore the causal link between FDI, domestic investment and economic growth in China and their results indicate that there is a bi-directional causality between domestic investment and economic growth, while there is single-directional causality from FDI to domestic investment and to economic growth. Adegbite and Ayadi, (2010), investigated the relationship between foreign direct investment flows and economic growth in Nigeria. The study confirmed the beneficial role of FDI in growth. However, the role of FDI on growth could be limited by human capital. Arshad & Shujaat (2011) further reported that Hermes and Lensink (2003) concluded that FDI exerts significant negative effect on the host country.

Uwubamwen and Ajao (2012) examined the determinants and impact of FDI in Nigeria from 1970 through 2009. As a tool for economic development and means of bridging the gaps between the rich and poor nations, their empirical analysis reveals that macroeconomic variables (exchange rate, interest rate, inflation) and openness of the economy are among the major and important factors that determine the inflow of FDI into Nigeria during these periods. Salami, Fatimah, Gazi and Makua (2012), in their study reported that FDI posses a significant negative effect on economic growth. Given contrasting evidence in the literature pertaining to the impact of Foreign Direct Investment on the host country's economy, Najia, Mryam and Nobeel, (2013), take the case of Pakistan and test the said association for this nation. The data used for this study spanned over the period of 1981 till 2010. Their findings indicate that Pakistan's economic performance is negatively affected by foreign investment while its domestic investment has benefitted its economy. Moreover, the nation's debt, trade and inflation have found to have negative impact on its GDP.

From the literature reviewed in prior studies, it can be deduced that the effects of Foreign Direct investment (FDI) on economic growth of developing economy like Nigeria are mixed. However, it was observed that that none of these studies used a more recent time series data in addition with these macroeconomic variables (exchange rate, inflation rate, trade openness, total debt and gross domestic investment) to empirically quantify the link between FDI and economic growth by examining the short and long run effect elasticity of FDI on economic growth in Nigeria. This study became necessary and unique in this light as never before. It is against this backdrop that the study determines the effect of FDI on economic growth in Nigeria within the framework of Solo growth model and Error Correction Model (ECM) techniques.

2.9 Theoretical Framework

Solow's (1957) pioneering contribution to growth theory has generated the theoretical basis for growth accounting. In this neoclassical view, we can decompose the contribution to output growth of the growth rates of inputs such as technology, capital, labor, inward FDI, or by incorporating a vector of additional variables in the estimating equation, such as exchange rate, interest rate, inflation rate etc. The growth accounting approach can be derived from the following equation:

$$Y = A\Phi(K, L, \Omega) \dots\dots\dots(1)$$

Where Y, K, L, and A are output, capital, labor, and the efficiency of production, respectively; and Ω is a vector of ancillary variables. Assuming, for example, a Cobb-Douglas form, and taking the logarithms and time derivatives of equation (1) yields:

$$g_Y = g_A + \alpha g_K + \beta g_L + \gamma g_\Omega \dots\dots\dots(2)$$

Where g_Y is the rate of growth of $AKL\Omega$ (the subscripts are defined in per capita terms), and, $\alpha \beta \gamma$ are the elasticities of output with respect to physical capital, labor and the ancillary variables respectively.

Findlay (1978) developed Solow's model and assumed that the growth rate of technology diffusion is an increasing function of FDI. By distinguishing between inputs into foreign capital (a developed country) and domestic capital (a developing country), he argues that an increase in foreign capital increases domestic capital. Our approach follows that of Cobb-Douglas production function as modified by Findlay (1978) and Fosu & Magnus (2006). Equation (2) can be reformulated as:

$$g_{YRGDPt} = g_A + \beta_{FDIt} + \beta_{DBt} + \beta_{Inft} + \beta_{Top} + \beta_{Exr} + \beta_{Gdit} \dots\dots\dots(3)$$

3. Methodology and Empirical Design

3.1 Variables Description

The model consists of seven variables, RGDP per capita (RGDP), foreign direct investment per Capita (FDI), Log of Total Debt Service (DBT), Gross Domestic Investment (GDI) as percentage of GDP, Inflation rate (INFL), Exchange Rate (EXR) and Trade Openness as a percentage of GDP (TOP). The subscript 't' represents respective variables at time t. Amongst these variables, RGDP is specified as the dependent variable, FDI is the core explanatory variable and the remaining five as the control explanatory variables because they are significant determinant of economic growth.

(a) Real GDP Growth Rate.

Our dependent variable in this case is Δ RGDP for which was use Real GDP per Capita. We have found in literature (Roubini & Sala, 1992, and King & Levine, 1993) that RGDP per Capita has been used as a proxy for economic growth. Another reason for using GDP per capita is to incorporate the population effect.

(b) Foreign Direct Investment

Foreign Direct Investment is essential and significant forecaster of the Economic Growth (Kowalski, 2000). FDI is a stimulator for economic growth in under-developed countries (Tsai, 1994). Akram, (2011) has established negative association of FDI with GDP growth by taking panel data of cross countries. The proxy used for FDI is the annual FDI data in US\$. Data for this variable is taken from the Central Bank of Nigeria (CBN) Statistical Bulletin. The expected sign for foreign direct investment is positive.

(c) Total Debt

A heavily indebted economy is perceived to be in trouble (Kowalski, 2000). It is argued that the external debt is a problem for the economy (Fosu, 1996). Debt is one of the key determinants of macroeconomic growth (Kowalski, 2000). Association between economic growth and Total Debt is found to be negative (Amjad & Khan, 2004; Kowalski, 2000). The surrogate used for Total Debt is Total Debt and Services (US \$). The data for the Debt is taken from the CBN Bulletin.

(d) Exchange Rate

Output growth could mainly be explained by —own shocks but was negatively affected by increases in exchange rate depreciation as well (Rodriguez & Guillermo, 1995). Rogers and Wang (1995) obtained similar results for Mexico. The surrogate that was used for this variable is Exchange rate and that data will be collected from CBN Statistical bulletin. It is expected to have a positive sign.

(e) *Gross Domestic Investment*

Gross Domestic Investment pertains to the contribution of Government of the country towards its economy (Kowalski, 2000). The literature purports a positive relationship between gross domestic investment and the economic growth (Kogid, 2010; Amjad & Khan, 2004; Baroo, 1996). The proxy used for this variable is Gross Domestic Savings as percentage of GDP. The data for this will be taken from CBN. It is expected to have a positive sign.

(f) *Inflation Rate*

Kowalski (2000) argues that inflation determines steadiness of the economy of the country. If the Inflation level is high, then that could be translated into an escalating level of problem for the economy. A negative relationship between inflation and economic growth has been documented in the literature. The proxy for this variable is Inflation, GDP deflator (annual %). Data for this variable is will be derived from CBN. We expect a negative correlation of this variable with our dependant variable, in line with the literature.

(g) *Trade Openness*

Trade has been taken as one of the key variable affecting economic growth. Trade openness has been widely used with a proxy of trade to GDP ratio in the literature, e.g. (Beck 2000). We have used Trade as a percentage of GDP as a proxy for trade variable and expect this variable to have a negative sign because of high imports as compared to exports in Nigeria. The data will be taken from CBN statistical bulletin.

3.2 *Preliminary Test and Estimation Procedure*

The econometric analysis we used for this study was based on co-integration econometric techniques. Prior to analysis involving co-integration, one needs to examine the stationarity for each individual time series variable since the assumptions for the classical regression model require that both variables be stationary and that errors have a zero mean and finite variance Engle and Granger (1987). The unit root test was evaluated using the Augmented Dickey-Fuller (ADF) and Philip Peron (PP) test which can be determined as:

$$\Delta Y_t = \alpha + \beta t + \delta Y_{t-1} + \gamma \sum_{i=1}^m \Delta Y_{t-i} + \varepsilon_t$$

Where α represents the drift, t represents deterministic trend and m is a lag length large enough to ensure that ε_t is a white noise process.

While Philip Peron test is based on the following equation:

$$\Delta Y_t = \beta_0 D_t + \pi Y_t - 1 + \mu t$$

When data set was stationary and integrated of the same order. Thereafter, the Engle and Granger (1987) two stage co-integration technique was used to check the existence of long run relationship between changes in dependent variable and all the explanatory variables. This is to ensure that the variables converge in the long run, as variable that do not converge may be detrimental to policy making. This method was carried out using econometric software (E-view 7.0) version. Finally the test for significance of all parameters was done using t-statistics; we must acknowledge here that some diagnostic test was carried out to check the authentication of our analysis.

3.3 *Model Specification*

The starting point of our empirical model is the augmented Cobb-Douglas production function framework, a modified form of equation (3) above, with FDI incorporated as one of the factor inputs and Debt, Inflation rate, Trade Openness, Exchange rate, Gross domestic investment and Growth rate of capital stock as ancillary variables. Substituting these variables into equation (3) above we have

$$\Delta RGDP_t = f(LFDI, LDBT, INFR, LTOP, EXR, LGDI) \dots \dots \dots (4)$$

Where we now separate capital into foreign direct investment (FDI) and Gross domestic investment (GDI). The subscripts for time t are also included. and ε_t is a time-varying idiosyncratic shock (disturbance term) with the standard assumption.

The proposed long-run equation in this study is specified as follow:

$$\Delta RGDP_t = \alpha_0 + \beta_1 Lfdi_t + \beta_2 Ldbt_t + \beta_3 Ltop_t + \beta_4 Exr_t + \beta_5 Lgdi_t + \beta_6 Infr_t + \mu_t \dots \dots \dots (5)$$

Hence the error correction model used in this study as short run equation is specified as:

$$\Delta \text{RGDP}_t = \alpha_0 + \beta_1 \sum_{t=1}^n \Delta \text{RGDP}_{t-1} + \beta_2 \sum_{t=1}^n \Delta \text{LFDI}_{t-1} + \beta_3 \sum_{t=1}^n \Delta \text{LDBT}_{t-1} + \beta_4 \sum_{t=1}^n \Delta \text{INFR}_{t-1} + \beta_5$$

$$\sum_{t=1}^n \Delta \text{LTOP}_{t-1} + \beta_6 \sum_{t=1}^n \Delta \text{EXR}_{t-1} + \beta_7 \sum_{t=1}^n \Delta \text{LGDI}_{t-1} + \delta_1 \text{Ecm}(-1) + \epsilon_t \dots\dots\dots(6)$$

Where:

- ΔRGDP = Changes in RGDP (Real GDP growth rate)
- LFDI = Log Foreign Direct Investment growth rate (%)
- LDBT = Log Total Debt Stock growth rate (%)
- INFR = Inflation Rate
- LTOP = Log Trade Openness (Volume of trade / GDP)
- EXR = Exchange Rate
- LGDI = Log Gross Domestic Investment growth rate (%)
- α₀ = Constant (Intercept)
- β₁, β₂, β₃, β₄, β₅ and β₆ = Coefficients
- ε_t = Error term
- Ecm(-1) = error correction term
- t = respective variables at time t
- β_i = captures the short run.
- δ₁ = captures the long-run impact.

A priori expectations as derived from empirical literatures are expressed as:

α₀ > 0; β₁, β₂, β₆, β₇, > 0 while β₃, β₄, β₅ < 0

On a final analysis, Engle and Granger causality test was use to ascertain the direction of causality between the variables. That is (if any) between FDI and its contributory variables on one side and economic development on the other side. The Engle and Granger causality test is specified as:

$$\Delta Y_t = \beta_0 + \sum_{t=1}^n \beta_1(1-L)\Delta Y_{t-1} + \sum_{t=1}^n \beta_2(1-L)\Delta X_{t-1} + \delta_1 \text{Ecm}(-1) + \epsilon_t \dots\dots\dots(9)$$

Where ΔY_t is dependent variable and X_{t-1} is the explanatory variables. The direction of the causality is determined by the F-statistic. While the t statistic on the coefficient of the lagged error-correction term represents the long-run causal relationship, the F statistic on the explanatory variables represents the short-run causal effect (Odhiambo (2010a).

4. Empirical Results

4.1 Descriptive Statistics

Table 4.1 Descriptive Statistics

	EXR	INFR	LFDI	LGDI	LTDBT	LTOP	RGDP
Mean	63.28088	20.80353	12.49295	12.01984	12.02121	4.407116	4.736765
Median	21.89000	12.09500	11.59241	12.28957	12.28991	4.326915	3.870000
Maximum	156.8100	76.76000	20.89868	15.20503	15.20512	5.958192	111.8600
Minimum	0.610000	0.220000	11.04257	9.082448	9.085682	2.934389	-99.59000
Std. Dev.	62.64051	19.20107	2.443283	2.118141	2.116723	0.768919	27.49882
Skewness	0.323109	1.466688	2.439268	0.072378	0.073146	0.459291	0.137819
Kurtosis	1.294480	4.088324	7.945168	1.597124	1.597138	2.695510	13.76776
Jarque-Bera	4.712396	13.86795	68.36097	2.817772	2.818349	1.326718	164.3626
Probability	0.094780	0.000974	0.000000	0.244415	0.244345	0.515118	0.000000
Sum	2151.550	707.3200	424.7602	408.6745	408.7210	149.8419	161.0500
Sum Sq. Dev.	129486.5	12166.48	196.9979	148.0553	147.8570	19.51080	24954.10
Observations	34	34	34	34	34	34	34

Source: Extracted from E-view 7.0 Output (Author’s Computation, 2015)

Table 4.1 reveals that the variables under consideration are found to be normally distributed. The ratio of mean to median of each variable is approximately one (except for EXR and INFR).

The standard deviation of each variable is also low (except for EXR, INFR and RGDP), compared to the mean showing a small coefficient of variation, the table also revealed a reasonable range of variation between maximum and minimum values. Kurtosis measures the peakness or flatness of the distributions, the kurtosis statistics of (1.29), (1.597), and (1.597) for EXR, LGDI, and (LTDBT) respectively, were wide apart and not close to three (3) as the benchmark for normal distribution. This implies that the series for these three variables do not possess flat distributions that are relative to normal. For INFR, LFDI and RGDP have (4.09), (7.95) and (13.77) as kurtosis value respectively which is wide apart from the criterion value of three (3), this implies that the series of these variables have a peaked distribution. As only LTOP has a kurtosis value of 2.69 which is close to three (3) as bench mark, which confirms near normality. The Jarque-Bera test statistics and its corresponding probability values also accept the null hypothesis of normal distribution of each variable.

4.2 Stationarity Results

Table 4.2: Unit root test result

AugumentedDickey-Fuller Test				Phillip-Perron Test			
Variable	Adf Stat	Order	Remark	Variable	Adf Stat	Order	Remark
RGDP	3.1215	1(0)	Non-Stationary	RGDP	9.8359*	1(0)	Stationary
	5.0518*	1(1)	Stationary		36.1040*	1(1)	Stationary
	4.1306*	1(2)	Stationary				
LFDI	1.6486	1(0)	Non Stationary	LFDI	2.1740	1(0)	Non-stationary
	1.0070	1(1)	Non Stationary		6.2815*	1(1)	Stationary
	4.1235*	1(2)	Stationary				
INFR	3.1399**	1(0)	Stationary	INFR	3.0223**	1(0)	Stationary
	5.4422*	1(1)	Stationary		11.4767*	1(1)	Stationary
	7.0698*	1(2)	Stationary				
EXR	0.0434	1(0)	Non Stationary	EXR	0.0434	1(0)	Non-Stationary
	5.4227*	1(1)	Stationary		5.4227*	1(1)	Stationary
	8.0486*	1(2)	Stationary				
LGDI	0.0105	1(0)	Non Stationary	LGDI	0.0343	1(0)	Non-Stationary
	8.6251*	1(1)	Stationary		9.6952*	1(1)	Stationary
	4.6927*	1(2)	Stationary				
LTOP	2.5004	1(0)	Not Stationary	LTOP	2.3698	1(0)	Non-Stationary
	9.0725*	1(1)	Stationary		17.0876*	1(1)	Stationary
	6.2921*	1(2)	Stationary				
LTDBT	0.0078	1(0)	Not Stationary	LTDBT	0.0372	1(0)	Non-Stationary
	8.6186*	1(1)	Stationary		9.6781*	1(1)	Stationary
	4.6942*	1(2)	Stationary				
Critical Values				Critical Values			
1%	3.6394	1(0)	Level	1%	3.6394	1(0)	Level
	3.6463	1(1)	1 st Diff		3.6463	1(1)	1 st Diff
	3.6999	1(2)	2 nd Diff				
5%	2.9511	1(0)	Level	5%	2.9511	1(0)	Level
	2.9540	1(1)	1 st Diff		2.9540	1(1)	1 st Diff
	2.9763	1(2)	2 nd Diff				
10%	2.6143	1(0)	Level	10%	2.6143	1(0)	Level
	2.6158	1(1)	1 st Diff		2.6158	1(1)	1 st Diff
	2.6274	1(2)	2 nd Diff				

NB: * and ** represents significant at 1% and 5% respectively.

Source: Extracted from E-view 7.0 Output (Author's Computation, 2015)

All the variables under ADF test (except INFR) are found not to be stationary in levels as shown in Table 2. As a result, all the variables have been differenced twice to check their stationarity. At first differencing I(1) the calculated ADF test statistics reveals that only LFDI was not stationary and at second differencing I(2) the calculated ADF test statistics clearly reject the null hypothesis of unit root at 1% and 5% significance levels when compared with their corresponding critical values. While on the other hand, all the variables under PP tests (except RGDP, INFR) are found to be nonstationary in levels as shown in Table 2 above. As a result, all the variables have been differenced once to check their stationarity. At first differencing the calculated PP test statistics clearly reject the null hypothesis of unit root at 1% and 5% significance levels when compared with their corresponding critical values, hence the ADF and PP tests decisively confirm stationarity of each variable although at second and first differencing respectively, and indicate different order of integration i.e. I(1) and I(2) behaviour. However, for the purpose of this study we stick to the ADF test statistics which depict that all variables are stationary at second differencing and indicate the same order of integration i.e. I(2). Thus, the Engle and Granger two stage co-integration approach is applied to examine the long run relationship among variables.

4.3 Co-integration Results

Table 4.3: Engle and Granger Co-integration test

Variable	Level	Mackinnon Critical Values	Remark
RESID (ECM)	-3.1352	-2.9678**	Stationary
**stationary at 5% level of significance			

Source: Extracted from E-view 7.0 Output (Author's Computation, 2015)

The Engel and Granger (1987) two stage co-integration techniques result in table 4.3 above, depicts that the residuals from the regression result are stationary at 5% level of significance. This means that all the explanatory variables are co-integrated with Real Gross Domestic Products (RGDP) in Nigeria over periods under consideration (1979 – 2013). In other words there exists a long run stable relationship between the dependent and independent variables. This finding also reveals that any short run deviation in their relationships would return to equilibrium in the long run. As a result, the error correction model is estimated.

4.4 Parsimonious Error Correction Model (ECM) Results

Table 4.4: ECM Short run and Long run regression results

Short run dependent variable: Δ RGDP						
Long run dependent variable: RGDP						
Variable	ECM Short Run Coefficient	t-Statistic	Prob.	Long Run Coefficient	t-Statistic	Prob.
C	-3.779360	-0.622838	0.5507	11.98419	0.186008	0.8538
EXR				0.094453	0.552372	0.5852
LFDI				-2.913968	-1.436420	0.1624
LGDI				4288.766	1.303927	0.2033
LTDBT				-4302.043	-1.305913	0.2026
LTOP				43.51581	5.897346*	0.0000
INFR				-0.149979	-0.739927	0.4657
DLFDI(-1)	37.96695	2.420492**	0.0418			
DLFDI(-2)	-56.40839	-2.196003**	0.0594			
DLFDI(-3)	-1.104824	-0.038709	0.9701			
DEXR	-0.323829	-1.167520	0.2766			
DEXR(-1)	-0.251271	-1.198767	0.2649			
DINFR	0.250796	1.337875	0.2177			
DINFR(-1)	0.410351	1.958347	0.0859			
DINFR(-2)	0.113600	0.523025	0.6151			
DINFR(-3)	-0.482796	-2.142415***	0.0645			
DLGDI	653.1309	0.195448	0.8499			
DLGDI(-1)	9702.364	2.441308**	0.0405			
DLGDI(-2)	2932.057	0.569750	0.5845			
DLTDBT	-629.3434	-0.187671	0.8558			
DLTDBT(-1)	-9721.587	-2.439551**	0.0406			
DLTDBT(-2)	-2925.192	-0.566541	0.5866			
DLTDBT(-3)	11.69698	1.501680	0.1716			
DLTOP	42.39883	5.828845*	0.0004			
DLTOP(-1)	16.48046	0.829314	0.4310			
DLTOP(-2)	-51.61271	-1.747553	0.1187			
DLTOP(-3)	-25.68965	-1.379932	0.2049			
ECM(-1)	-0.787070	-2.020229***	0.0480			
R-squared	0.972242			0.578213		
Adjusted R-squared	0.899378			0.484483		
F-statistic	13.34324			6.168900		
Prob(F-statistic)	0.000408			0.000361		
Durbin -Watson Stat	1.951889			2.386759		

NB: *, ** and *** represents significant at 1%, 5% and 10% respectively.

Source: Extracted from E-view 7.0 Output (Author's Computation, 2015)

Table 4 above reports the error correction model (ECM) for changes in RGDP in Nigeria from 1979 to 2013 using autoregressive regression techniques. The results clearly shows a well defined error correction term (Ecm(-1)) with an expected negative coefficient and it is significant when compared to its corresponding t-value of (-2.020). The coefficient measures the speed at which Δ RGDP disequilibrium adjusts to long run equilibrium after short run shock.

The ECM coefficient of 0.79 approximately indicates that about 79% of the previous year's disequilibrium in the economy (Δ RGDP) is corrected in the long run. The statistical significance of the error correction coefficient at 5% level supports our earlier assertion that Δ RGDP is indeed co-integrated with the explanatory variables. In a case where the ECM coefficient is greater than zero it means there is a surplus of the dependent variables, a reduction is therefore required to restore equilibrium as opine by (Patterson, 2000).

The coefficient of determination R-squared value of 0.97 reveals that about 97% approximately of total systematic variation in Nigeria Economy (Δ RGDP) is jointly explained by all the explanatory variables taking together using the ECM model. The coefficient of determination when adjusted for the degree of freedom yielded approximately 90% as indicated by the adjusted R^2 value of 0.89937, implying that the model has a goodness of fit that is above average since about 10% of what happens to Δ RGDP in Nigeria is not captured in this model but captured by the stochastic error term. The F-statistic test which is used to determine the overall significance of regression model, reveals that there exist statistically significant linear relationships between the dependent and all explanatory variables at 1% levels (F-value 13.34) in the error correction model. This therefore means that all the explanatory variables have significant relationship with the dependent variable. In other words, the overall model (i.e. the coefficients of the entire explanatory variables as they relate to the dependent variable) is statistically different from zero.

Specifically, one, two and three period lag of Foreign Direct Investment (FDI) had a mixed effect on Nigeria economy (Δ RGDP). The one period lag of FDI variable had positive and significant relationship with Nigerian Δ RGDP except two and three period lag of FDI which had negative significant relationship (for two period lag) and negative insignificant relationship (three period lag) respectively, this means that FDI effect on Nigerian economy has both immediate and time lag effect in the short run. While the long run coefficient result shows that FDI have an insignificant negative effect on Nigeria economy during the period under consideration. Also, the One period lag of exchange rate (EXR-1) considered in the short run had an insignificant negative effect on Nigeria economy growth (Δ RGDP), while the current year EXR has an insignificant negative effect on the Nigeria economy. In the long run, EXR had a positive but insignificant effect on Nigeria economy growth.

Also, the results shows that one and two three years past inflation rate (INFR) considered in the short run had an insignificant positive relationship with economy growth (Δ RGDP) in Nigeria while three year INFR had a negative significant relationship with Δ RGDP in Nigeria. In the long run regression results, INFR had a negative but insignificant relationship with Δ RGDP in Nigeria. Furthermore, the results reveal that LGDI had an insignificant positive effect on Δ RGDP, the one and one period lag of LGDI considered had a significant positive relationship with Δ RGDP in Nigeria while two period lag of LGDI had a positive insignificant relationship with Δ RGDP in Nigeria in the short run. In the long run regression results, LGDI had a positive but insignificant relationship with Δ RGDP in Nigeria.

The one and two three lagged period considered for LTDBT had significant negative relationship with economy growth in Nigeria while one year LTDBT had a negative significant relationship with Δ RGDP in Nigeria, the two period lag had an insignificant negative relationship with economy growth in Nigeria. The three period lag had an insignificant positive relation with Δ RGDP in Nigeria in ECM result. In the long run regression results, LTDBT had a negative but insignificant relationship with Δ RGDP in Nigeria as anticipated in our *A priori* expectation. In the same vein, the LTOP and its one and two three periods lag considered had a significant positive relationship with Δ RGDP in Nigeria in the short run. One period lag had an insignificant positive relationship with Δ RGDP while two and three period lag had an insignificant negative relationship with Nigeria Δ RGDP in the ECM result. LTOP had a significant positive relationship with Nigeria economy growth in the long run.

The results in general revealed that the Δ RGDP growth experienced in Nigeria was greatly determined by Foreign Direct Investment (FDI), Gross Domestic Investment (GDI) and Trade Openness (TOP) in the short run. And positively but insignificantly related to EXR and GDI in the long run. Also Δ RGDP was negatively but insignificantly affected by FDI and TDBT in the long run. The results also point out in clear terms that only TOP contributed significantly to Δ RGDP growth both in short and long run during the period under review. The results in the short run show that FDI, INFR, TDBT and TOP variable lags had mixed relationship with Δ RGDP in the short run. The ECM and OLS long run regression with Durbin Watson-statistic value of 1.95 and 2.39 respectively shows that there is no evidence to accept the presence of autocorrelation in the model. This means that the model is valid and can be used for policy recommendation without re-specification.

4.5 Causality Test

Table 4.5: Pair wise granger causality tests

Null Hypothesis:	F-Statistic	Prob	Decision	Causality
<i>RGDP does not Granger Cause LFDI</i>	16.9732	2.E-05	Accept	Unidirectional
<i>LFDI does not Granger Cause RGDP</i>	2.04425*	0.0156	Reject	
<i>INFR does not Granger Cause EXR</i>	0.72495	0.4932	Accept	

*,** and *** represent 1%, 5% and 10% significant level respectively

The macroeconomic outlook of the variables used in the analysis may imply interrelationships among them. Hence, the Granger causality test which is part of our estimation technique in this study is used to provide the background for estimating dynamic relationships. The results in table 5 above shows the Pairwise Granger causality test among the variables analyzed. The F-test is conducted on the null hypotheses in order to determine the direction of causality between each pair of variables, and the rejection of each of the null hypothesis is based on the significance of the F-value for the particular relationship.

Most importantly, the test result reveals clearly that in relation to FDI, the null hypothesis that Δ RGDP does not granger cause LFDI is accepted, but the null hypothesis that LFDI does not granger cause Δ RGDP is rejected. This implies that LFDI granger causes Δ RGDP that is there is a positive and direct relationship between FDI and RGDP. The more FDI we have in Nigeria, the higher the level of economic growth and development. This means that FDI has contributed significantly to the growth of Nigeria economy during the period under consideration.

The empirical results from this study in a nutshell reveal that Foreign Direct Investment (FDI) contributed significant to Nigeria economic growth, it also granger cause economic growth in the same vain during the period under consideration.

5. Findings and Concluding Remarks

Our empirical analysis reveals that Foreign Direct Investment (FDI) has both immediate and time lag effect on the Nigerian economy in the short run. And FDI has an insignificant negative effect on the Nigerian economy in the long run during the period under review. This was further confirmed by the causality test which shows that FDI granger causes RGDP and not the other way. This result is consistent with the findings of Chase-Dunn (1975), Dixon (1996), Egbo (2011), Folorunso (2008), Edoumiekumo (2009). The granger causality analysis revealed that FDI granger cause economic growth (RGDP) and not the other way round. This finding supports the conclusions of Akinlo (2004). Thus FDI have a significant positive effect on the growth as well as the development of Nigeria economy only in the short run during the period under review.

We therefore conclude and recommend that government should ensure stable macroeconomic policies as a stabilization tool to propel the attraction of more FDI into Nigeria. Also, policy consistencies, investment and political stability are also pertinent in attracting and retaining foreign direct investment. Finally, government should increase its expenditure in the area of infrastructural development as ways to accelerate the growth of Nigerian economy. Thus, dependency on foreign direct investment should remain limited.

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