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RESEARCH ARTICLE

FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN NIGERIA: A GRANGER CAUSALITY ANALYSIS

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ABSTRACT

The main aim of this study is to establish if there is a causal relationship between Foriegn Direct Investment (FDI) and economic growth in Nigeria. This study used annual time series variables computed from natural logarithms of gross domestic product (GDP) at current prices, net inflow of FDI, inflation rate and exchange rates, covering a period of 27years that span from 1981 to 2007. The study utilized the Ordinary Least Square, Unit root test to test for stationarity of the time series and Granger causality test to establish the causal relationship between the variables. The stationarity test (unit root) showed that the included variables, gross domestic product (GDP), foreign direct investment (FDI), exchange rate (EXRATE) and inflation rate (INFRATE) were non-stationary at their level and first difference with 2 lags. They were thus integrated of order one, I(1). The Granger causality test was adopted and it showed that a causality relationship ran from FDIs to GDP and not from GDP to FDIs. The findings showed that there is a positive relationship between FDI and GDP which implies that FDI stimulates economic growth in Nigeria. It is imperative, therefore, that the enabling environment should always be provided in Nigeria in order to attract more foreign investment and further stimulate the country's economic growth.

INTRODUCTION

Foreign Direct Investment (FDI) which is an investment made to acquire lasting interest in enterprises operating outside the economy of the investor, has long been a subject of great interest in the field of international development. In an era of volatile flows of global capital, the stability of FDI and its emergence as an important source of foreign capital for developing economies have once again renewed interest in its linkages with sustainable economic growth. FDI inflows have contributed to a strengthening of the balance of payments in several African countries. In 2006, foreign reserves in the region as a whole grew by 30%, and by even more in some major oil-exporting countries such as Nigeria and the Libyan Arab Jamahiriya (World Investment Report, 2007). In the mid 1970s, Africa's share of global FDI was about 6%, a level that fell to the current 2–3%. Among developing countries, Africa's share of FDI in 1976 was about 28%; it is now less than 9% (UNCTAD, 2005). Nigeria is turning out to be one of the most attractive countries in terms of foreign investment inflows. Foreign direct investment increased from less than US$ 1billion in 1990 to US$ 1.2billion in 2000; US$1.9 billion in 2004; US$ 2.3billion in 2005 and US$ 4.5 billion in 2006. As percentage of GDP, foreign direct investment has increased substantially in recent years. The same pattern is witnessed in portfolio investment, which grew from US$0.2 billion in 2003 to US$ 2.9 billion in 2005 and US$ 0.92 billion in 2006. This is attributable to the economic reforms and the resulting of macroeconomic stability, which have instilled great credibility in the Nigerian economy. Home remittances are also becoming an increasingly important catalyst to growth in Nigeria. In 2004, Nigeria received an estimated US$ 2.26 billion in home remittances; this has continued to increase remarkably with a recorded figure of over US$7 billion in 2006 (Bello, 2006). Nigeria's economy has experienced strong growth in recent years. Real GDP growth averaged 7.8 percent from 2004 to 2007, and growth of 6.4 percent in 2007 exceeded the low-income sub-Saharan (LI-SSA) median (4.0 percent), the LI median (6.0 percent), and the rate in Indonesia (6.3 percent), although it was lower than the rate in Kenya (7.0 percent) (see Figure 2-1). Oil accounts for nearly 40 per cent of GDP, but from 2001 to 2006—except in 2003—real growth in other sectors outpaced growth in the oil sector. Sectors that have experienced particularly strong growth include telecommunications, which has been liberalized and privatized over the past decade, and wholesale and retail trade.

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Agriculture has also shown some growth, although it remains far from fulfilling its potential (Economist Intelligent Unit, 2008). Nigeria's per capita GDP is high relative to GDP in other LI-SSA countries. In purchasing power parity dollars, GDP per capita grew from $1,597.90 in 2003 to $2,034.60 in 2007—an average annual growth rate of 5.6 percent. It is now far higher than the LI-SSA's median per capita GDP ($1,018.00) and Kenya's ($1,359.00) but still much lower than that of Indonesia ($3,234.00). In spite of the plethora of studies on FDI and economic growth in Nigeria, the existing empirical evidence on the causal relationship between foreign direct investment and economic growth and the associated benefits is very inconclusive. In spite of a seemingly positive association between FDI and economic growth, the empirical literature has not reached a consensus on the direction of this impact, however, suggesting that foreign direct investment can be either beneficial or harmful to economic growth. The principal driving force for this work is that for developing economies, and for Nigeria in particular, the issue of economic growth is an important one.

It is thus, of interest to investigate whether the part cause of growth can be attributed to an increased inflow of FDI into the country over the period under review. It becomes natural therefore to ask: whether the growth which has been experienced in the economy for the past years was as a result of the contribution of Foreign Direct Investment or that the country has already attained this growth level before attracting Foreign Direct Investment? Chowdhury and Mavrotas (2005) have proposed that individual country studies be carried out to ascertain this causal relationship. The results of studies carried out on the linkage between FDI and economic growth in Nigeria are not unanimous in their submissions. Due to this reason, it therefore becomes difficult to ascertain the direction of FDI and economic growth relationship in Nigeria. There is therefore limited exhaustive country specific research studies to establish the causal relationship and interaction between foreign direct investment and economic growth. This, thus, provides a major incentive for this study.

The objectives of this study include:

- ✓ To access whether Foreign Direct Investments cause economic growth in Nigeria.
- ✓ To find out whether there is a bi-directional relationship between Foreign Direct Investments and economic growth in Nigeria.

Based on the above objectives, the following hypotheses are relevant for our study:

- ✓ Ho_1 Increase in Foreign Direct Investment does not cause economic growth in Nigeria.
- ✓ Ho_2 There is no bi-directional relationship between FDI and economic growth in Nigeria.

This paper is divided into five sections. Apart from section one, which treated the introduction, objectives, research questions and hypotheses; section two discusses the related literature on FDI and economic growth. Section three appraises the interrelationship between FDI and economic growth. Section four presents the methodology used in the data analysis while five contains our findings and conclusion.

REVIEW OF RELATED LITERATURE

There is conflicting evidence in the literature regarding the question as to how, and to what extent, FDI affects economic growth. FDI may affect economic growth directly because it contributes to capital accumulation, and the transfer of new technologies to the recipient country. In addition, FDI enhances economic growth indirectly where the direct transfer of technology augments the stock of knowledge in the recipient country through labour training and skill acquisition, new management practices and organizational arrangements (De Mello, 1999). Theoretically, however, in the context of either neo-classical or endogenous growth models, the effects of FDI on the economic growth of the receiving country differ in the recent growth models from their conventional counterparts. The conventional economic growth theories are being augmented by discussing growth in the context of an open rather than a closed economy, and the emergence of externality-based growth models. Even with the inclusion of FDI in the model of economic growth, traditional growth theories confine the possible impact of FDI to the short-run level of income, when actually recent research has increasingly uncovered an endogenous long-run role of FDI in economic growth determination (De Mello, 1999). According to the neo-classical models, FDI can only affect growth in the short run because of diminishing returns of capital in the long run. In contrast with the conventional neo-classical model, which postulates that long run growth can only happen from the both exogenous labour force growth and technological progress, the rise of endogenous growth models (Barro and Sala-i-Martin, 1995) made it possible to model FDI as promoting economic growth even in the long run through the permanent knowledge transfer that accompanies FDI. As an externality, this knowledge transfer, with other externalities, will account for the non-diminishing returns that result in long run growth (De Mello, 1997). Hence, if growth determinants, including FDI, are made endogenous in the model, long run effects of FDI will follow. Therefore, a particular channel whereby technology spills over from advanced to lagging countries is the flow of FDI (Bengoa and Sanchez-Robles, 2003).

The other theme of empirical research of FDI-growth relationship concentrated on identifying determinants of FDI flow and analyzing the effects of these determinants on the attractiveness of the host country to, and the volume and type, of such flows. Two sets of factors are frequently cited. The first set includes the size of the recipient market, relative factor prices, and balance of payments constraints (Bhasin et al., 1994; Love and Lage-Hidalgo, 2000; Lipsey, 2000). The second set includes institutional factors such as degree of openness and trade policies, legislative environment and law enforcement and the degree of economic and political stability (Lipsey, 2000). Recognizing the importance of FDI to their growth, many countries are using specific incentives to attract FDI inflow. Tax breaks and rebates are examples of such incentives (Tung and Cho, 2001). Nevertheless, the effectiveness of such incentives has been questioned (Guisinger, 1992). Although economists are in agreement with respect to the direct benefits of technological transfer on the host country firms, the measurement of indirect spillover effects is shrouded with difficulties. As a result, the evidence is mixed. For example, an extensive review by (Blomstorm,

Globerman and Kokko, 2000) both at aggregate and case studies levels, found no strong consensus on the magnitude of spillover effects. A study of UK owned 20 manufacturing industries by (Harris and Robinson, 2004) concludes that "…inter-industry spillovers are just as likely to be negative as positive…. and so there is clear evidence of an overall beneficial effects on UK manufacturing industries resulting from supply side linkages associated with FDI." Using a World Bank survey of 1500 firms in five Chinese cities, (Hale and Long, 2006) found evidence of positive spillover effects for more technologically advanced firms but none or even negative spillover effects for relatively small firms. From this, they concluded that a well functioning labour market facilitates FDI spillover by creating network externalities among highly skilled workers. Despite some of the evidence presented in recent studies, there are several theoretical arguments why developing countries may not gain from FDI. Krugman (1998) argues that the transfer of control from domestic to foreign firms may not always be beneficial to the host countries because of the adverse selection problem. FDI undertaken within a crisis situation under "Fire Sale" may transfer ownership of firms from domestic to foreign firms that are less efficient. This concern is particularly important to the developing countries including the SSA countries, where, as part of privatization, state owned enterprises are sold to foreign firms simply because foreign firms have more available funds than domestic ones. As pointed out by (Salz, 1992; Agosin and Mayer, 2000), FDI may also "crowd out" domestic firms through unfair competition. Empirical evidence on the link between FDI and economic growth is also inconclusive. These authors, (Bosworth and Collins,1999; Blomstrom *et al.,*2000; Borensztein *et al.* 1998; Zhang, 2001; De Mello, 1997; Balasubramanyam *et al.,* 1996 and Obwona, 2001) provide evidence on the positive effects of FDI on economic growth. Growth enhancing effect of FDI is not, however, automatic, but depends on various country specific factors. Also, (UNCTAD, 2005; Blomstrom *et al.,* 2000; and De Mello, 1997) indicate that the stronger the positive effect of FDI is, the higher the level of development of a host country. Higher level of development allows countries to reap the benefits of productivity fostered by foreign investment. For similar reasons, (Bronsznestein *et al.,* 1998) have found that significant relations between FDI flows and economic growth depend on the level of human capital. Host countries with better endowment of human capital are believed to benefit more from FDI induced technology transfer as spillover-effects than others with less human capital. More recently, (Balasubramanyam *et al,*. 1996 and UNCTAD, 2005) suggest that the positive effects of FDI also depend on openness to trade. FDI can broaden access to export markets as transnational corporations often serve as channels for the distribution of goods from one country to other markets located in another country. Similarly, (Nair-Reichert and Weinhold , 2000), using a mixed fixed and random panel data estimation method to allow for cross country heterogeneity in the causal relationship, find some evidence that there is efficacy of FDI in raising future growth rate, although heterogeneous across countries, is higher for more open economies.

Interrelationship between FDI and Economic Growth

All arguments regarding the potential negative impact of FDI on growth point to the importance of certain enabling conditions to ensure that the negative effects do not outweigh the positive impacts. At present, the consensus seems to be that there is a positive association between FDI inflow and economic growth, provided the enabling environment is created. Given the fact that economic growth is strongly associated with increased productivity, FDI inflow is particularly well suited to affect economic growth positively. The main channels through which FDI affects economic growth has been uncovered by the new growth theorists (Markusen, 1995; Lemi and Asefa, 2001; Barro and Sala-I-Martin, 1995; and Borensztein, et al, 1998). These authors (Barro and Sala-I-Martin, 1995; and Borensztein, et al., 1998), in particular, have developed a simple endogenous growth model which demonstrates the importance of FDI in engendering growth through technological diffusion.

Typically, technological diffusion via knowledge transfer and adoption of best practice across borders is arguably a key ingredient in rapid economic growth. And this can take different forms. Imported capital goods may embody improved technology. Technology licensing may allow countries to acquire innovations and expatriates may transmit knowledge. Yet, it can be argued that FDI has greatest potential as an effective means of transferring technical skills because it tends to package and integrate elements from all of the above mechanisms. First, FDI can encourage the adoption of new and improved technology in the production process through capital spillovers. Second, FDI may stimulate knowledge transfers, both in terms of manpower training and skill acquisition and by introduction of alternative management practices and better organizational arrangements (Grossman 1991,1995; Lenisk et al 2001).

A number of empirical studies have been undertaken to establish robust results in regard to the causal relationship of foreign direct investment to economic growth, its impact and determinants. The results of the studies showed varied evidence with some indicating that foreign direct investment causes economic growth, others showing the reverse relationship and in some cases there is no reported relationship. Recent empirical studies show that the impact of foreign direct investment on economic growth is not straight forward as previously envisaged but that it depends on country specific factors. Carkovic and Levine (2006) found that a country's capacity to benefit from foreign direct investment externalities is limited by local conditions, such as the development of local financial markets or the educational level of the country's population. In the study conducted by (Basu and Guariglia, 2007), a sample of 119 developing countries were used in the study for the period of 1970 – 1999 using the Generalized Methods of Moments (GMM) and the study revealed that FDI enhances both educational inequalities and economic growth in developing countries. However, it reduces the share of agriculture sector in GDP. Johnson (2006) also used a sample of 90 developed and developing countries in his study of economic growth and FDI in the time period of 1980 – 2002 where he applied the ordinary least square (OLS) method. He was able to ascertain that FDI inflows accelerate economic growth in developing countries. But it is not valid for developed countries. Also, (Hyun, 2006) used a sample of 59 developing countries in his study for the period of 1984 – 1995, he also used ordinary least square (OLS) method. He concluded that FDI has positive effect on economic growth

but lagged FDI values have no positive effects on current economic growth in these countries for the period under study. Carkovic and Levine (2002) using panel data from 72 developed and developing countries performed both a cross section Ordinary Least Square and the Generalised Method of Moments (GMM) analysis and found that there is no robust link from foreign direct relationship to economic growth. De Mello (1999) using both time series and panel data from a sample of 32 developed and developing countries found weak indications of the causal relationship between foreign direct investment and economic growth. In their own study, Li & Liu (2005) used 21 developed countries and 63 developing countries to study the impact of FDI on growth, using the time period of 1970 – 1999. He applied the Unit Root Tests, Durbin – Wu –Hausman Test, and ordinary least square (OLS) method and was able to ascertain that endogenous relationship between FDI and economic growth has accelerated since the middle of 1980s. Also that relationship between FDI, human capital and technological differences affect economic growth in developing countries indirectly. Saha (2005) used 20 Latin America countries and Caribbean countries during the period of 1990 – 2001. He used 3 Stage of Least Squares and found out that FDI and economic growth are important determinants of each other in Latin America and Caribbean and that there is an endogenous relationship between FDI and economic growth. When conducting the study of growth and FDI, (Durham, 2004) used 80 countries between the period of 1979 – 1998. He used the Extreme Bound Analysis (Sensitivity Analysis) for the study. He concluded that there is no direct positive effect of current and lagged values of FDI and portfolio investment on economic growth. Hermes and Lensink (2003) in their own study using 67 less developed countries during the time period of 1970 to 1995 with the ordinary least square (OLS) method, found out that financial development level of a FDI attracting country is an important pre-condition in order to provide positive effect of FDI on economic growth. Bengoa and Sanchez –Robles (2003) used 18 Latin America countries for the time period of 1970 to 1999. The Hausman Test and ordinary least square (OLS) method was used in the study. They found out that economic freedom is an important determinant of FDI inflows. Also FDI affects economic growth positively.

RESEARCH METHODOLOGY

In line with similar studies on FDI and economic growth especially across countries as was discussed in the literature review, the study used a linear regression approach in determining the direction of causality between FDI and economic growth, while incorporating other macroeconomic variable like exchange rate, and inflation rate. The statistical methods used include the Ordinary Least Squares Method (OLS), Unit root test and the Granger no causality test. These methods were used in order to avoid a number of challenges and issues that normally crop up when qualitative methods are used especially in econometric studies. Also for this study, aggregate time series data were used because of its stationary characteristics. This implies that the mean and standard deviation do not systematically differ over a period of time. In addition, aggregate data are normally very useful in establishing long term econometric relationships between variables. The population of the study is the entire Nigerian economy and the data was drawn from 1981 to 2007.

$$lnGDP = \gamma_0 + \sum_{i=1}^{k+d} \alpha_{1i} lnGDP_{t-i} + \sum_{i=1}^{k+d} \beta_{1i} lnFDI_{t-i} + \sum_{i=1}^{k+d} \lambda_{1i} lnEXRATE_{t-i} + \sum_{i=1}^{k+d} \delta_{1i} lnINFRATE_{t-i} + \varepsilon_{1t} \quad \text{.....(1a)}$$

$$lnFDI = \psi_0 + \sum_{i=1}^{k+d} \kappa_{1i} lnFDI_{t-i} + \sum_{i=1}^{k+d} \mu_{1i} lnGDP_{t-i} + \sum_{i=1}^{k+d} \eta_{1i} lnEXRATE_{t-i} + \sum_{i=1}^{k+d} \rho_{1i} lnINFRATE_{t-i} + \varepsilon_{2t} \quad \text{.....(1b)}$$

$$lnEXRATE = \omega_0 + \sum_{i=1}^{k+d} \sigma_{1i} lnEXRATE_{t-i} + \sum_{i=1}^{k+d} \phi_{1i} lnGDP_{t-i} + \sum_{i=1}^{k+d} \iota_{1i} lnFDI_{t-i} + \sum_{i=1}^{k+d} \delta_{1i} lnINFRATE_{t-i} + \varepsilon_{3t} \quad \text{.....(1c)}$$

$$lnINFRATE = \varpi_0 + \sum_{i=1}^{k+d} \tau_{1i} lnINFRATE_{t-i} + \sum_{i=1}^{k+d} \zeta_{1i} lnGDP_{t-i} + \sum_{i=1}^{k+d} \theta_{1i} lnFDI_{t-i} + \sum_{i=1}^{k+d} \varsigma_{1i} lnINEXRATE_{t-i} + \varepsilon_{4t} \quad \text{.....(1d)}$$

where ln*GDPGR* and ln*FDI* are, the natural logarithm of GDP growth (proxy for economic growth) and of foreign direct investment respectively, and INFL and EXCO represent inflation rate and exchange rate that proxies macroeconomic stability. *k* is the optimal lag order, *d* is the maximal order of integration of the variables in the system and ε_1 and ε_2 are error terms that are assumed to be white noise. Each variable is regressed on each other variable lagged from one (1) to the $k+d_{max}$ lags in the SUR system, and the restriction that the lagged variables of interest are equal to zero is tested. Finally, in order to determine the direction of causality between this two variables; FDI and economic growth, the Granger no-causality test is applied.

The Unit Root test was used to test for stationarity/non-statonarity of the variable. This was done in other to avoid the danger of obtaining spurious regression. If this is not done, a significant result may be obtained from unrelated data. The unit root test for this work was done by using the Augumented Dickey-Fuller Test. The ADF tests allow one to specify how lagged difference terms are to be included in the ADF test equation. In this case, we have chosen to estimate an ADF test that includes a constant in the test regression and employs automatic lag length selection using a Schwarz Information Criterion (BIC) and a maximum lag length of 2. Applying these settings to data on the Nigerian FDI and economic growth figure for the period 1981 to 2007, we can obtain the results as described below. The first part of the unit root output provides information about the form of the test (the type of test, the exogenous variables, and lag length used), and contains the test output, associated critical values, and in this case, the p-value.

From the result, if the statistic t_{α} value is greater than the critical values, we reject the null at conventional test sizes and vice versa. The second part of the output shows the intermediate test equation is used to calculate the ADF statistic. In assessing the statistical properties of the data series used. First, the order of integration in each of the GDP, FDI, EXRATE and INFRATE series were tested. The stationarity test, that is the unit root showed that the included variables were non-stationary at their level and first difference. The exception is INFRATE, which is I(0), but others are integrated of order one I(1). The lag lengths were chosen using Akaike Information Criteria (AIC). This means that the null of a unit root for the individual series was not rejected for all of the series tested. Given the short span of the individual series, we do not reject the entire unit root null for the 27 observations. On the other hand, some were rejected in 0 and 1lag respectively. The results strongly support the conclusion that the series are stationary only after being differenced once. Hence, it shows that the series are integrated of order one, i.e.,

I(1) at the 1%, 5% and 10% significance levels. In brief, the test results on the levels of GDP, FDI, EXRATE and INFRATE indicate a failure to reject the null of non-stationarity. Unit root test for the variable were in their levels and 1st difference forms. Having established that the various series are integrated of the first order, the second step in testing the relationship between FDI, GDP, EXRATE and INFRATE is to test for the cointegration relationship between the variables, in order to determine if there is a long-run relationship between the two variables. The test for the long-run relationship between both variables was done using Johansen cointegration test. It can be seen from the test results in the table that there are two cointegrating equations at both 1% and 5% significance level. This implies a long run relationship among the variables. That is, there is a long-run steady-state relationship between FDI, GDP, EXRATE and INFRATE for Nigeria. Once we have established a cointegration relationship between the variables, then we may conclude that there exists a long-run relationship between them, even if they are individually non-stationary. If the trace statistics or the Likelihood ratio is greater than the critical value, then there is a cointegration.

Using a lag length of 3 for the Granger test which we think corresponds to a reasonable time over which one of the variables could help predict the other. The reported F-statistics are the Wald statistics for the joint hypothesis that the coefficients on the lagged values of the other variable are zero for each equation. The F-statistics is the Wald statistics for the null hypothesis. If the coefficient of $\sum_{i=1}^{k+d}\alpha, \sum_{i=1}^{k+d}\kappa, \sum_{i=1}^{k+d}\sigma$ and $\sum_{i=1}^{k+d}\tau$ in equations 1a, 1b, 1c and 1d respectively is significantly different from zero, then we conclude that GDP Granger causes FDI or FDI causes GDP and so on. Granger causality in both directions is of course, a possibility.

ANALYSIS/DISCUSSION OF RESULTS

In table 1 (see appendix), we have the summary of the unit root test for some of the variables that were used in the analysis. The R-squared statistics measures the regression in predicting the values of the dependent variables within the sample. The R-squared statistics is the fraction of the sample mean of the dependent variable. The log likelihood is the value of the function evaluated at the estimated values of the coefficients. The figures were arrived at by looking at the log likelihood of the equation. The AIC or the Akaike Information Criterion is a guide to the selection of the number of terms in an equation. This is normally based on the sum of squared residuals but places a penalty on extra coefficients. The Schwarz criterion is basically the same with AIC but the only difference is that it places larger penalty for extra coefficients. The Durbin-Watson statistics is a test for serial correlation. If it is far less than 2 there is an evidence of positive serial correlation. On the other hand if it approximately or exactly 2, then there is complete absence of serial correlation.

From table 2 (see appendix), it can be seen that the AC's are significantly positive and that AC(k) dies off geometrically with increasing lags k, it is a sign that the series obeys a low-order autoregressive (AR) process. In addition, since the partial autocorrelation (PAC) is significantly positive at lag 1 and close to zero thereafter, the pattern of autocorrelation can be captured by an auto regression of order one, that is, AR(1).

Results of the Tests

To test H_{O1} ,we use simple regression analysis which is found not to be spurious by the rule of thumb. The result of the simple regression analysis is presented in table as follow.

Table 4: OLS Regression

Dependent Variable: GDP
Method: Least Squares
Sample: 1981 – 2007
Included observations: 27

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	898800.1	1002023.	0.896986	0.3783
FDI	258.1693	51.68672	4.994887	0.0000
R-squared	0.499488	Mean dependent var		3825390.
Adjusted R-squared	0.479468	S.D. dependent var		5854329.
S.E. of regression	4223775.	Akaike info criterion		33.42154
Sum squared resid	4.46E+14	Schwarz criterion		33.51753
Log likelihood	-449.1908	F-statistic		24.94890
Durbin-Watson stat	1.066784	Prob(F-statistic)		0.000038

Estimation Command:
==========
LS GDP C FDI
Estimation Equation:
==========
GDP = C(1) + C(2)*FDI
Substituted Coefficients:
==========
GDP = 898800.0969 + 258.1693386*FDI

It is evident from table 4 that the probability value 0.0000 is lower than 0.5 which suggests the rejection of the null hypothesis for a two tailed test at 5% significance level. It can also be seen that the calculated t-value of 4.994 for FDI is equally significant at the 5% level of significance. By this, the null hypothesis that growth in foreign direct investment does not exert significant impact on economic growth in Nigeria is rejected, thereby accepting the alternate hypothesis that the growth in foreign direct investment significantly influences economic growth in Nigeria. This implies that economic growth which has been experienced in Nigeria for the period under review has a lot to do with the inflow of foreign direct investment into the country.The test for hypothesis 2, H_{O2} using Granger Causality Tests are presented in table 5 bellow.

Table 5: Causality between the Variables

Pairwise Granger Causality Tests
Sample: 1981 – 2007
Lags: 3

Null Hypothesis:	Obs	F-Statistic	Probability	Causality
IN_FDI does not Granger Cause IN_GDP	19	2.87981	0.04004	Yes
IN_GDP does not Granger Cause IN_FDI		0.94361	0.45015	No
IN_EXRATE does not Granger Cause IN_GDP	24	2.89669	0.06539	Yes
IN_GDP does not Granger Cause IN_EXRATE		1.22121	0.33243	No
IN_INFRATE does not Granger Cause IN_GDP	24	1.02492	0.40631	No
IN_GDP does not Granger Cause IN_INFRATE		0.88101	0.47055	No
IN_EXRATE does not Granger Cause IN_FDI	19	2.05260	0.16021	Yes
IN_FDI does not Granger Cause IN_EXRATE		0.70506	0.56713	No
IN_INFRATE does not Granger Cause IN_FDI	19	0.71594	0.56121	No
IN_FDI does not Granger Cause IN_INFRATE		0.09807	0.95958	No
IN_INFRATE does not Granger Cause IN_EXRATE	24	1.83817	0.17851	No
IN_EXRATE does not Granger Cause IN_INFRATE		2.91176	0.06451	Yes

From table 5 above, the F-statistic and the probability values indicate that IN_FDI granger causes IN_GDP with no reverse or feed back effect. From the above observation, the null hypothesis that FDI does not Granger cause GDP is rejected. This shows that the null hypothesis that there is a bi-directional relationship between FDI and economic growth in Nigeria is rejected thereby accepting the alternate hypothesis that there is a unidirectional relationship between FDI and economic growth in Nigeria. The result show that there is a causality between foreign direct investment and economic

growth in Nigeria for the period under review and the causality runs from FDI to GDP and not from GDP to FDI indicating a unidirectional relationship. There is also no causality between EXRATE/GDP, EXRATE/FDI and EXRATE/INFRATE. The findings also revealed that there is no causality relationship between GDP/EXRATE, INFRATE/GDP, GDP/ INFRATE, FDI/EXRATE, INFRATE/FDI, FDI/INFRATE and EXRATE/INFRATE.

SUMMARY AND CONCLUSION

From the analysis, it is clear that the inflow of foreign direct investment caused economic growth in Nigeria within the period under review. Also, from the result of the Granger causality test, it was ascertained that the causality ran from FDI to GDP and not from GDP to FDI. The positive relationship implies that Foreign Direct Investment stimulates economic growth in Nigeria. The result can be put forward as a guide for policy makers to take the advantage of foreign direct investment spillover effects. The positive relationship also indicates that foreign direct investment has really contributed to the growth of the Nigerian economy for the period under review. Moreover, strong evidence emerging from this study shows that economic growth as measured by GDP in Nigeria is Granger caused by FDI, which shows that Nigeria's capacity to progress on economic development will depend largely on the country's performance in attracting foreign direct investment. This study supports the impact of FDI on GDP growth in Nigeria. These findings confirm the relevance of the economic reform programmes in Nigeria to reduce macro-economic instability, remove economic distortions, promote exports and restore sustainable domestic investment for economic growth. The study also revealed that there is no significant positive spillover from foreign direct investment and exchange rate (FDI - EXRATE) and foreign direct investment and inflation rate (FDI - INFRATE).

This implies that they do not have a direct effect on each other, no causality exists between them. Finally from the findings of this study, the conservative view that the direction of causality runs from FDI to economic growth was confirmed in the case of Nigeria. This supports the validity of policy guidelines which stipulates the importance of foreign direct investment for the growth and stability of developing countries under the assumption of FDI led growth.From the foregoing, it becomes imperative that improving the currently bad image of the country is the key to reversing the dismal FDI trend of the country and Africa at large. This requires an increase in Political stability, Macroeconomic stability and the protection of property rights as well as the rule of law. It is suggested that in order to attract greater inflows of foreign direct investment in the future, African nations and Nigeria in particular, need to accelerate progress towards more open economies, greater economic freedom, more effort in fighting corruption and a legal environment that guarantees property rights (Egbo, 2010). Finally, Nigerian leaders should make sure that the principles enshrined in the New Partnership for Africa's Development (NEPAD) documents are taken seriously and implemented in the country, because there is the distinct possibility that this may change the quality of economic policy-making in the country and improve the investment climate. A robust and efficient mechanism of monitoring and recording foreign direct investment flows should be established. This will enable policy makers, academics and stakeholders make accurate decisions, forecasts and also undertake studies. Our leaders should improve on its effort to curb corruption which they are already doing with the help of agencies established to fight corruption such as the Economic and Financial Crimes Commission (EFCC) and Independent Corrupt Practices Commission (ICPC). These agencies should be seen to do their job to convince both foreigners and nationals that Nigeria is a safe place to invest in.

APPENDIX

Table 1: Unit root test for the variables in levels with (2) lags

R-squared	Log-Likelihood	Akaike info criteria	Schwarz criterion	Durbin-Watson statistics
IN_GDP in levels				
Without Intercept and Trend				
0.015845	6.379904	-0.28165	0.134402	1.927139
With Intercept				
0.050699	6.812582	-0.234382	-0.038040	1.929477
With Intercept and Trend				
0.219570	9.163162	-0.346930	-0.101502	1.951935
IN_GDP in difference				
Without Intercept and Trend				
0.320661	3.275501	-0.023957	0.124151	2.149471
With Intercept				
0.495482	6.696955	-0.234518	-0.037041	2.015476
With Intercept and Trend				
0.496035	6.709547	-0.148656	0.098190	2.017834
R-Squared	**Log-Likelihood**	**Akaike info criteria**	**Schwarz criterion**	**Durbin-Watson statistics**
IN_FDI in levels				
Without Intercept and Trend				
0.544728	-25.80373	3.031971	3.181093	1.828717
With Intercept				
0.548507	-25.72455	3.128900	3.327729	1.816064
With Intercept and Trend				
0.651159	-23.27407	2.976218	3.224755	1.988063
IN_FDI in difference				
Without Intercept and Trend				
0.852739	-23.98965	3.175253	3.322291	1.930492
With Intercept				
0.859947	-23.56310	3.242718	3.438768	1.949330
With Intercept and Trend				
0.863719	-23.33104	3.333064	3.578126	1.938208
R-Squared	**Log-Likelihood**	**Akaike info criteria**	**Schwarz criterion**	**Durbin-Watson statistics**
IN_EXRATE in levels				
Without Intercept and Trend				
-0.185464	-10.50209	1.125174	1.272431	2.017030
With Intercept				
0.142307	-6.618380	0.884865	1.081207	2.065805
With Intercept and Trend				
0.207077	-5.676132	0.889678	1.135106	2.042848
IN_EXRATE in difference				
Without Intercept and Trend				
0.365406	-10.47585	1.171813	1.319921	2.010247
With Intercept				
0.473150	-8.336048	1.072700	1.270177	2.003364
With Intercept and Trend				
0.553528	-6.432356	0.994118	1.240964	2.138722
R-Squared	**Log-Likelihood**	**Akaike info criteria**	**Schwarz criterion**	**Durbin-Watson statistics**
IN_INFRATE in levels				
Without Intercept and Trend				
0.284424	-24.88413	2.323678	2.470934	2.031279
With Intercept				
0.386407	-23.03905	2.253254	2.449596	1.916733
With Intercept and Trend				
0.398214	-22.80589	2.317158	2.562585	1.903975
IN_INFRATE in difference				
Without Intercept and Trend				
0.621380	-24.65166	2.404492	2.552600	1.812523
With Intercept				
0.624877	-24.54496	2.482170	2.679647	1.812859
With Intercept and Trend				
0.626281	-24.50182	2.565376	2.812222	1.817765

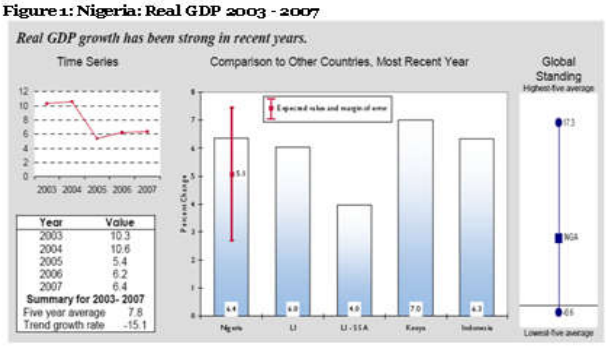
Table 2: Test for non-stationarity by calculating the auto correlation function ACF

Sample: 1981 - 2007
Included observations: 27

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
. |******* |	. |******* |	1	0.902	0.902	24.498	0.000
. |****** |	. |*| . |	2	0.803	-0.059	44.670	0.000
. |***** |	. |*| . |	3	0.695	-0.098	60.441	0.000
. |**** |	. |*| . |	4	0.585	-0.079	72.092	0.000
. |**** |	. | . |	5	0.480	-0.037	80.306	0.000
. |*** |	. |*| . |	6	0.372	-0.091	85.467	0.000
. |**. |	. | . |	7	0.270	-0.045	88.326	0.000
. |*. |	. |*| . |	8	0.166	-0.091	89.467	0.000
. |*. |	. | . |	9	0.074	-0.029	89.702	0.000
. | . |	. |*| . |	10	-0.017	-0.077	89.716	0.000
. *| . |	. |*| . |	11	-0.113	-0.120	90.335	0.000
.**| . |	. |*| . |	12	-0.201	-0.073	92.438	0.000

Source: Authors' calculations based on domestic authorities' data.

Figure 1: Nigeria: Real GDP 2003 - 2007



Source: IMF Article IV Nigeria, 2008 and IMF World Economic Outlook Database (April, 2008)

Fig. 1: Statistical description of GDP

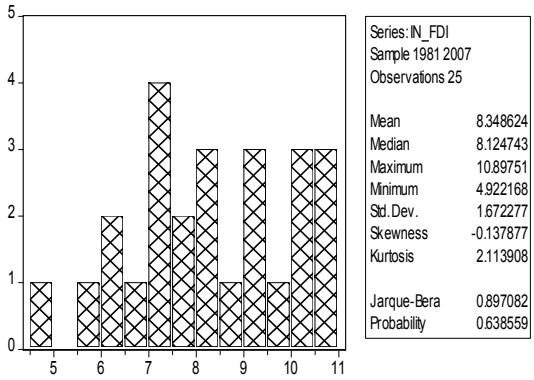


Fig. 2: Statistical description of FDI

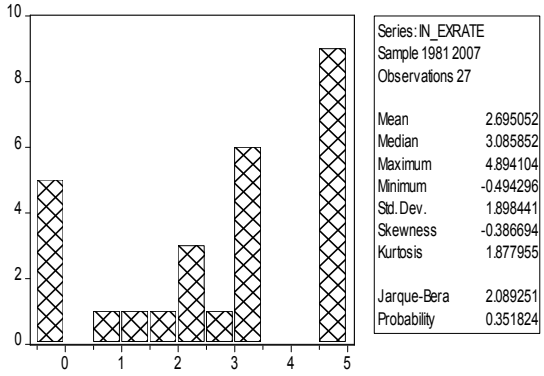


Fig. 3: Statistical description of EXRATE

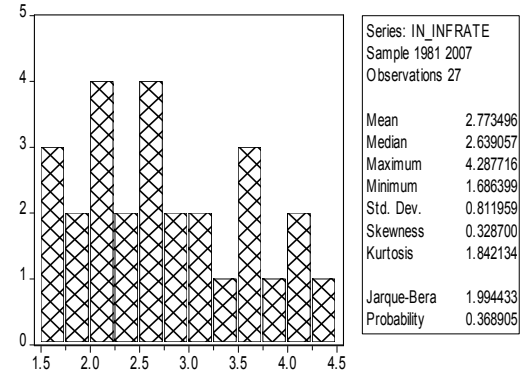


Fig. 4: Statistical description of NFRATE

Table 3: Summary of Descriptive Statistics

	IN_GDP	IN_FDI	IN_EXRATE	IN_INFRATE
Mean	13.66757	8.348624	2.695052	2.773496
Median	13.71000	8.124743	3.085852	2.639057
Maximum	16.96314	10.89751	4.894104	4.287716
Minimum	10.77100	4.922168	-0.494296	1.686399
Std. Dev.	2.059819	1.672277	1.898441	0.811959
Skewness	-0.044467	-0.137877	-0.386694	0.328700
Kurtosis	1.598013	2.113908	1.877955	1.842134
Jarque-Bera	2.220161	0.897082	2.089251	1.994433
Probability	0.329532	0.638559	0.351824	0.368905
Observations	27	25	27	27

Source: Authors' calculations based on domestic authorities' data.

Various Data generated for the Statistical Analysis

S/N	Year	Net Flow of FDI	GDP Current Price	Exchange Rate	Inflation Rate
1	1981	137.3	47,619.70	0.61	20.9
2	1982	1,624.90	49,069.30	0.6729	7.7
3	1983	556.7	53,107.40	0.7241	23.2
4	1984	534.8	59,622.50	0.7649	39.6
5	1985	329.7	67,908.60	0.8938	5.5
6	1986	2,499.60	69,147.00	2.0206	5.4
7	1987	680	105,222.90	4.0179	10.2
8	1988	1,345.60	139,085.00	4.5367	38.3
9	1989	-439.4	216,707.50	7.3916	40.9
10	1990	-464.30	267,550.00	8.0378	7.5
11	1991	1,808.00	312,139.80	9.9095	13.0
12	1992	8,269.20	532,613.80	17.2984	44.5
13	1993	32,994.40	683,869.20	22.0511	57.2
14	1994	3,907.20	899,863.20	21.8861	57.0
15	1995	48,677.00	1,933,211.60	21.8861	72.8
16	1996	2,731.00	2,702,719.10	21.8861	29.3
17	1997	5,730.90	2,801,972.60	21.8861	8.5
18	1998	24,078.80	2,708,430.90	21.8861	10.0
19	1999	1,779.10	3,194,023.60	92.6934	6.6
20	2000	3,347.00	4,537,637.20	102.1952	6.9
21	2001	3,377.00	4,685,912.20	111.9433	18.9
22	2002	8,205.50	5,403,006.80	120.9702	12.9
23	2003	13,056.50	6,947,819.90	129.3565	14.0
24	2004	19,909.10	11,411,066.90	133.5004	15.0
25	2005	25,881.80	14,610,881.50	132.147	17.9
26	2006	41,470.80	15,564,594.70	128.6516	8.2
27	2007	54,041.90	23,280,715.00	125.8331	5.4

Source: Central Bank of Nigeria Statistical Bulletin

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