

Foreign Direct Investment and the growth of the Nigerian Economy

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Abstract

This paper investigates the relationship between economic growth (GDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN) in Nigeria from 1981 to 2013. The paper employed Augmented Dickey-Fuller and Phillip-Perron technique in testing the unit root property of the series, Granger causality test of causation between the variables, Engel-Granger ECM technique in testing the long run adjustment speed of the model, Breusch-Pagan-Godfrey test of heteroskedasticity, Breusch-Godfrey serial correlation test, Ramsey RESET test of mis-specification, Chow Breakpoint test, after which Jarque-Bera test of normality. The results of the OLS revealed that foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN) impacted positively on economic growth (GDP) in the Nigeria. The results of unit root suggest that all the variables in the model are stationary at first difference $d(1)$. The results of Causality suggested that one-way causation existed between economic growth (INGDP) and foreign direct investment (INFDI) but the causation runs from economic growth (INGDP) to foreign direct investment (INFDI) implying that GDP can cause FDI but not the other way round. One-way causation also existed between economic growth (INGDP) and openness (OPN) but the causation runs from openness (OPN) to economic growth (INGDP) implying also that OPN can cause GDP but not the other way round. The result further indicated that no causation existed between exchange rates (EXR) and economic growth (INGDP), openness (OPN) as well as foreign direct investment (INFDI), no causation existed between openness (OPN) and foreign direct investment (INFDI). The ECM result revealed the existence of long run relationship between economic growth (INGDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN). The speed of adjustment was found to be at least three years for the long run equilibrium. This paper found that, there is no serial correlation among the error values, no mis-specification of the model, and also that the variables of the are not stable throughout the period of the study and the break was found to be 1999 when the current democratic dispensation started. The result further revealed that the residuals of the model are normally distributed which make it possible for the results of this paper be used for policy purposes. In conclusion, this paper found a positive and significant relationship between economic growth and foreign direct investment in Nigeria. Therefore, this paper recommends that concerted effort be made by policy makers and relevant authorities to formulate policies aim at creating a conducive investment environment so that Nigeria can be better destination for foreign investment Policy makers should also take step to ensuring foreign exchange stability and increase openness of the economy so as to achieve meaningful economic growth.

Keywords: Foreign direct investment (FDI), economic growth, foreign exchange, openness

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1.0 Introduction

The prevailing trend in business by governments globally is the systematic process of wooing and or attracting multinational companies to come and invest in a given country with a view to achieving mutual benefits. The multinational companies make the investment in what is known as foreign direct investment (FDI). In other words, over the past two decades, most Governments have been actively involved in advertising and promoting their countries as investment destinations to attract scarce private capital, technical knowhow; managerial skills and other associated technology with sole intent of achieving their developmental goals. Nations have not relented in increasing tactics and or strategies capable of facilitating the entry of foreign direct investment (FDI) into their territories. Nigeria is not left behind because one of the major agenda in the late Yar'adua's administration was to induce investment – foreign investors.

It is an undisputable fact that foreign direct investment brings about scores of benefits to all the parties involved. The universe has since been metamorphosed into a village, this, has made business and business environments more stiff competitive wise. This recent scenario had made organizations to adopt varied corporate and or production strategies with a view to remaining active participants and or a dominants in the business world.

Bello (2011) opined that for FDI to continuously flow and to be sustained in any given economy there is the need to ensure a conducive and friendly investment climate. Again, World Bank (2003) suggested that for any country to benefit from FDI there is the need for the establishment of infrastructure, political risk, labour cost and productivity, openness, size of market and incentives. However, in order to avert the tendencies of turning countries into a dumping ground, and encouraging the growth and development of local industries so that they could favourably compete with their foreign counterparts as well as enhancing FDI, government do take varied fiscal measures.

One of such fiscal measures is taxation. Taxation is simply put as the compulsory contribution made by individuals and corporate organizations to the government of a given country with a view to complementing and or providing income for the government to discharge its civic responsibilities (Buhari, 1991, Aguolu, 2002).

It is an instrument used to regulate and control fund and other socio-political and economic activities. If government wishes to make economic activities boom it reduces its tax rate and if otherwise it increases it. In other words tax regulates an economy thereby ensuring an enabling and business friendly environment (Abiola and Asiweh, 2012)

Nigerian tax system has three broad intertwined components which must all be effective in order to have a virile and sound tax system. These are tax administration, tax policies and tax laws (Committee on National tax policy, 2008). Tax administration has to do with all the procedures and or processes involved in ensuring that laws and policies are strictly adhered to. This can only be achieved where there are competent staff; good and conducive working environment; application of modern facilities and approaches in identifying, assessing, collecting and remitting of actual tax collected as at when due. Tax laws and policies serve as the ethics, rules and regulations and guidelines which assist government, tax authorities and other stakeholders to know and appreciate the state of tax in the country.

It is important to appreciate the fact that one of the major objectives of any good tax system is the ability to assist government in wooing investors both within and without. This cannot be possible where there is a problem with the tax laws, policies and administration. These three interwoven variables must work together as a system in order to see the success and effectiveness of a tax system.

Despite the numerous efforts made by government to use tax in stimulating FDI it appeared that significant impact has not been made. Empirical evidences have it that most investors seem to be skeptical about the tax system for it does not work effectively and efficiently. Perhaps the most inherently difficult challenge is how to strike a balance between tax regimes that are investment friendly and expected returns from such sacrifice. This study intends to find the relationship between tax system and foreign direct investment in Nigeria with a view to enhancing the administration and procedures of taxation in Nigeria perhaps it will pave more ways for Nigeria to attract more foreign investment.

The new paradigm for growth and development is through Foreign Direct Investment (FDI).

Nations are devising different mechanisms capable of attracting FDI to their territory. Government do charges higher tax particularly on imported goods and or imported services in order to prevent multinational companies to have field day and enhanced the growth of indigenous companies.

Most foreign investors opined that they are investing in countries as a result of what they referred to as more important factors (primary variables) such as basic infrastructure, political stability, low cost and availability of labor and what have you. However, ample facts about Nigeria have it that in spite of the abundant natural resources the Nigerian economy had been in steep decline over the past decades. The economy was yet to experience the necessary critical structural changes that would guarantee rapid growth and sustainable human development. Poverty and unemployment, poor infrastructure, insecurity, inconsistency in government policies, high cost of doing business, It is important to appreciate the fact that taxes are working in other nations and hence Iheanyi (2011) posited that Nigeria's case needs not be different as investment experts are recommending that taxation should be seen as not only means of revenue generation but also as a catalyst for attracting and sustaining Foreign Direct Investment (FDI).

It then follows that if the primary variables are nothing to write home about and the tax system were not effective, there is then the need to demystify the issue. Could it be that there is problem in the administration of the taxes on investment just the way it is in personal income tax as claimed by Adebisi, (2010) or could it be that the tax policies and laws are not efficient to woo investors Naiyeju (2010) opined that Nigerian tax system is still having series of constraints which need to be revisited. Tax can play a useful role in encouraging both domestic and foreign investment. How useful, and at what cost, depends on how well the tax system are designed, implemented, and monitored.

The main objective of the study is to examine the relationship between growth (GDP) and foreign direct investment.

In order to achieve the objectives raised above, the following hypothesis was formulated in null form to guide the study:

H_{0,1}, there is no significant relationship between foreign direct investment (FDI) and economic growth in Nigeria

2.0 Review of Related Literature

This section presents the review of the relevant literature on foreign direct investment and economic growth in Nigeria including a review of empirical studies on the subject matter. The review is divided into different section and the literature covered an overview of Nigerian economic growth and foreign direct investment, the concept of economic growth, and its importance, concepts of foreign direct investment and its merits and the like. This will go along way in assisting the researcher to make informed deductions viz-a-viz providing factual answers to the hypotheses formulated and thereby addressing the problem that prompted the study.

Foreign Direct Investment (FDI)

FDI has been defined by various scholars and stakeholders at different times for instance Omankhanlen (2011), sees Foreign Direct investment as an investment made by an investor or enterprises in another enterprise or equivalent in voting power or other means of control in another country with the aim to manage the investment and maximize profit. In brief, FDI serves as an important engine for growth in developing countries through two modes of action: expanding capital stocks in host countries and bringing employment, managerial skills, and technology. Several frameworks have evolved for analyzing the determinants and effects of FDI.

Macaulay (2011) citing World Bank (1996); Adeolu (2007), citing World Bank (2006), opined that FDI is an investment made to acquire a lasting management interest a business enterprise operating in a country other than that of the investor. Foreign direct investment (FDI) is an integral part of an open and effective international economic system and a major catalyst to development. Yet, the benefits of FDI do not accrue automatically and evenly across countries, sectors and local communities. National policies and the international investment architecture matter for attracting FDI to a larger number of developing countries and for reaping the full benefits of FDI for development. The challenges primarily address host countries, which need to establish a transparent, broad and effective enabling policy environment for investment and to build the human and institutional capacities to implement them (Pfister, 2009).

The Relevance of Foreign Direct Investment to Nigeria

Foreign direct investment (FDI) is increasingly being recognized as an important factor in the economic development of countries. Besides bringing capital, it facilitates the transfer of technology, organizational and managerial practices and skills as well as access to international markets (UNCTAD, 2000). More and more countries are striving to create a favorable and enabling climate to attract FDI as a policy priority. In addition to reducing the restrictions on the entry of FDI, they are actively liberalizing their FDI regimes. The goal of FDI is to increase investment and expand the range of economic activities (Bruce, 2004). Olayiwola and Okadua (2007) said that FDI is one of the most important strategies for the promotion of economic growth and development in poor developing countries.

FDI can serve as an engine of growth and development for developing countries by increasing the opportunity for their integration into global financial and capital flows, expand employment and exports base, generate technological capability-building and efficiency spillovers to local firms, as well as establish investment arrangements that increase the potential of host countries for economic growth.

The benefits of FDI include serving as a source of capital, generating employment, facilitating access to foreign markets, and generating both technological and efficiency spillovers to local firms. It is expected that by providing access to foreign markets, transferring technology and generally building capacity in the host country firms, FDI will inevitably improve the integration of the host country into the global economy and foster growth (Ajayi, 2006)

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Investment Allowances

Investment allowances are deductions from taxable income based on some percentage of new investment (depreciation). They tend to lower the effective price of acquiring capital. Both investment allowances and investment tax credits are given as a specified percentage of qualifying investment expenditures. Because they are deducted against the tax base, however, their value to the investing firm depends, among other things, on the value of the corporate income tax rate applicable to the tax base — the higher (lower) the tax rate, the higher (lower) is the amount of tax relief on a given amount of investment allowance claimed (Aviana, 2009). Depending on whether investment allowances must be claimed in the year they were earned or not, their value to a firm will differ.

Investment Tax Credits

Investment tax credits may be flat or incremental. A flat investment tax credit is earned as a fixed percentage of investment expenditures incurred in a year on qualifying (targeted) capital. In contrast, an incremental investment tax credit is earned as a fixed percentage of qualifying investment expenditures in a year in excess of some base that is typically a moving-average base (e.g. the average investment expenditure by the taxpayer over the previous three years). The intent behind the incremental tax credit is to improve the targeting of the relief to incremental expenditures that would not have occurred in the absence of the tax relief

In some countries, investment tax credits may only be claimed in the year they are earned. Typically, however, unused credits may be carried forward for a limited number of years to offset future tax liabilities. As in the case of investment allowances, they are meaningful to firms only if they can be carried forward or backward. Another option is to make unused credits refundable (i.e. allow their value to be claimed in cash in the year earned).

This can considerably increase the attractiveness of the incentive. However, it entails significantly higher revenue cost for the Government and a risk of abuse.

Empirical evidence has it that tax policies in Nigeria are positively correlated with investment. A typical example is that of MTN who took the advantage and stayed up to about seven (7) years in Nigeria without paying a penny to the government. But has assisted via transfer of technical knowhow, employment generation transfer of technology and the integration of the company into global player (Ajayi, 2006)

3.0 Methodology of the Research

This section explains the procedures used by the researcher in eliciting the necessary and or relevant data needed for the study. It presents the methodology of the research. The source of data for this study is secondary through CBN statistical Bulletin. In order to analyze the data generated for the study, the statistical tool utilized were OLS technique (multiple regression), ADF and PP unit root test, Granger causality test, after which ECM was used to determine the existence of long run relationship between the variables of the model and the speed of adjustment of the model to equilibrium in the long run. .

Model Specification

To establish the relationship between economic growth (GDP) and FDI this model was developed:

$$GDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXR + \beta_3 OPN + \varepsilon_1 \dots \dots \dots \quad 1$$

$$\ln GDP_t = \ln \beta_0 + \beta_1 \ln FDI_t + \beta_2 \ln EXR + \beta_3 \ln OPN + \ln \varepsilon_2 \quad \dots \dots \dots \quad 2$$

Where $\ln GDP$ is natural logarithm of gross domestic product at current basic prices, $\ln FDI$ is natural logarithm of foreign direct investment, $\ln EXR$ is natural logarithm of foreign exchange rate, $\ln OPN$ is natural logarithm of openness which is obtained by export divided by import and ε_i is stochastic variable or error term (random walks).

Apriori Expectation

It is expected that $\beta_0\beta_1\beta_2\beta_3 > 0$

Granger Causality Model

The model of causality test is thus specified as follows:

$$\begin{aligned}
 \text{GDP} &= \sum \beta_1 \text{GDP}_{t-1} + \sum \beta_2 \text{FDI}_{t-1} + \sum \beta_3 \text{EXR}_{t-1} + \sum \beta_4 \text{OPN}_{t-1} + \mu_{t1} \text{-----} 1 \\
 \text{FDI} &= \sum \phi_1 \text{GDP}_{t-1} + \sum \phi_2 \text{FDI}_{t-1} + \sum \phi_3 \text{EXR}_{t-1} + \sum \beta_4 \text{OPN}_{t-1} + \mu_{t2} \text{-----} 2 \\
 \text{EXR} &= \sum \alpha_1 \text{GDP}_{t-1} + \sum \alpha_2 \text{FDI}_{t-1} + \sum \alpha_3 \text{EXR}_{t-1} + \sum \beta_4 \text{OPN}_{t-1} + \mu_{t3} \text{-----} 3 \\
 \text{OPN} &= \sum \pi_1 \text{GDP}_{t-1} + \sum \pi_2 \text{FDI}_{t-1} + \sum \pi_3 \text{EXR}_{t-1} + \sum \pi_4 \text{OPN}_{t-1} + \mu_{t4} \text{-----} 4
 \end{aligned}$$

Decision Rules

The decision rule for equation (1), (2),(3) and (4) under causality models is test of null hypothesis that the estimated coefficients are equal to zero at an appropriate level of significance or using the rule of thumb that if t-statistic is at least 2 the null hypothesis is rejected otherwise accepted. Therefore,

Equation(1) FDI, EXR or OPN causes GDP if Ho: $\beta_2, \beta_3, \beta_4 = 0$ is rejected.

Equation(2) GDP, EXR or OPN causes FDI if Ho: $\phi_1, \phi_3, \phi_4 = 0$ is rejected.

Equation(3) FDI, GDP or OPN causes EXR if Ho: $\alpha_1, \alpha_2, \alpha_4 = 0$ is rejected.

Equation(4) FDI, EXR or GDP causes OPN if Ho: $\pi_1, \pi_2, \pi_3 = 0$ is rejected.

Error Correction Model (ECM)

The Engel-Granger (1987) developed an error correction technique to examine cointegrating vectors. This cointegration test is based on an examination of the residuals of a spurious regression performed using 1(1) variables. If variables are cointegrated then the residuals should be 1(0). On the other hand if the variables are not cointegrated then the residuals will be 1(1). This test applies Error Correction Model (ECM) technique. After establishing stationary of the data, Johansen Co-integration test is applied to determine whether a long run relationship exist among the variables in question.

When it is established that the variables are co-integrated, an over-parameterized model (ECM1) is developed which involves leading and logging of the variables after which parsimonious model (ECM2) is built in accommodate short-run dynamic in the model. The ECM was also used in estimating the speed of adjustment to the deviation in the long run equilibrium.

The over parameterized ECM was specified as follows:

$$\Delta GDP_{t-1} = \alpha + \sum FDI_{t-1} + \sum EXR_{t-1} + \sum OPN_{t-1} + ECM_{t-1}$$

..... (9)

Where: GDP is gross domestic product at current basic prices, FDI is foreign direct investment, EXR is foreign exchange rate, OPN is openness which is obtained by export plus import divided by GDP and ECM_{t-1} = Error Correction term, t-1 = Variable Lagged by one period.

4.0 Result and Discussion

Table 1: Regression Results

Dependent Variable: INGDP

Method: Least Squares

Date: 12/18/14 Time: 15:15

Sample: 1981 2013

Included observations: 33

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.356856	0.649543	3.628487	0.0011
INFDI	0.327087	0.099231	3.296235	0.0026
INEXR	0.556916	0.159827	3.484484	0.0016
INOPN	0.024016	0.107667	0.223057	0.8251
R-squared	0.924834	Mean dependent var		7.854129
Adjusted R-squared	0.917058	S.D. dependent var		2.189663
S.E. of regression	0.630615	Akaike info criterion		2.028970
Sum squared resid	11.53259	Schwarz criterion		2.210365
Log likelihood	-29.47801	Hannan-Quinn criter.		2.090004
F-statistic	118.9373	Durbin-Watson stat		0.435355
Prob(F-statistic)	0.000000			

E-Views 7 output

Table 1 contains multiple regression results for economic growth proxy by GDP, foreign direct investment, exchange rates and openness in Nigeria. The results indicate that the constant, the coefficients of foreign direct investment (FDI) and foreign exchange rates (EXR) are found to be statistically significant while the coefficient of openness (OPN) was found to be statistically insignificant. Precisely, the constant, coefficients of foreign direct investment (FDI) and foreign exchange rates (EXR) are found to be statistically significant at 1 percent level respectively as indicated by their probability values of 0.0011, 0.0028, and 0.0016 respectively. The coefficient of openness (OPN) was found to be statistically insignificant at 82.51 per cent as indicated by its probability value of 0.8251. The coefficients foreign direct investment (FDI), foreign exchange rates (EXR) and openness (OPN) were rightly signed (positive) and consistence with theoretical expectation this study. The regression results implies that 1 unit change in foreign direct investment (FDI), foreign exchange rates (EXR) and openness (OPN) raises economic growth rate (GDP) by 0.327087, 0.556916 and 0.024016 units respectively. The F-statistics value of 118.9373, which measure the joint effects of the explanatory variables, was found to be significant at 1 per cent as indicated by the corresponding probability value 0.000000. This implies that the variables of the model are jointly and statistically significant affected economic growth (GDP) in Nigeria.

The R^2 value of 0.9248 implies that 92.48 per cent of the total variation in economic growth (GDP) in Nigeria was explained by foreign direct investment (FDI), foreign exchange rates (EXR) and openness (OPN). Coincidentally, the goodness of fit of the regression remained high after adjusting for the degree of freedom as indicated by the adjusted R^2 ($R^2 = 0.9171$ or 91.71%). The R-Square suggested that not only the included variables of the model that affect economic growth rate in Nigeria, but there are other variables, although their influence is higher insignificant than those variables captured in the model. The Durbin-Watson statistics (0.935355) in table 1 is higher than R^2 (0.924834) indicating that the model is non-spurious. The Durbin-Watson statistics value of (0.924834) is very low and less than 2 indicating the presence of/or positive autocorrelation. This provides the basis for conducting unit root test.

Table 2: Unit Root Test Results for GDP, FDI, EXR and OPN

VAR	CRITICAL VAL (1%)	ADF 1(1)	CRITICAL VAL (1%)	PP 1(1)	PROB. (ADF)	PROB. (PP)	REMARK
INGDP	-3.6617	-5.3043	-3.6617	-5.3262	0.0001*	0.0001*	1(1)
INFDI	-3.6617	-5.2451	-3.6617	-7.5102	0.0002*	0.0000*	1(1)
INEXR	-3.6617	-4.4023	-3.6617	-4.3839	0.0015*	0.0016*	1(1)
INOPN	-3.6617	-6.0961	-3.6617	-6.8841	0.0000*	0.0000*	1(1)

*Stationary at 1percent

ADF = Augmented Dicky Fuller Statistics

PP = Phillips-Perron Statistics

The results of unit root test were contained in table 2. The results of both ADF and PP revealed that all the variables of the model were stationary at 1percent as indicated by their probability values. The result further indicated that economic growth rate (GDP), foreign direct investment (FDI), foreign exchange rates (EXR), and openness (OPN) were stationary at first difference 1(1). The ADF and PP statistics for all the variables are less than the critical values in negative direction. These results provide the basis for conducting Engel-Granger error correction test (ECM).

Table 3: ECM Unit Root Test Result

Null Hypothesis: ECM has a unit root

Exogenous: Constant

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.99806	0.0434
Test critical values:		
1% level	-3.653730	
5% level	-2.957110	
10% level	-2.617434	

The results of ECM unit root test were contained in table 3. The results of both ADF revealed that ECM residuals are stationary at 5percent as indicated by its probability value of 0.0434. The result further indicated that the ECM residuals are stationary at level 1(0). This paper further supports the adoption of ECM techniques in testing the speed of adjustment in the long run of the included variables.

Table 4: Pair wise Granger Causality Tests

Pairwise Granger Causality Tests

Date: 12/18/14 Time: 15:16

Sample: 1981 2013

Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
INFDI does not Granger Cause INGDP	31	1.30923	0.2872
INGDP does not Granger Cause INFDI		3.57178	0.0426
INEXR does not Granger Cause INGDP	31	2.28920	0.1214
INGDP does not Granger Cause INEXR		0.06968	0.9329
INOPN does not Granger Cause INGDP	31	3.28058	0.0500
INGDP does not Granger Cause INOPN		0.00802	0.9920
INEXR does not Granger Cause INFDI	31	1.32283	0.2837
INFDI does not Granger Cause INEXR		0.27018	0.7654
INOPN does not Granger Cause INFDI	31	1.74131	0.1951
INFDI does not Granger Cause INOPN		0.24117	0.7874
INOPN does not Granger Cause INEXR	31	0.15863	0.8541
INEXR does not Granger Cause INOPN		0.07834	0.9249

The results of causality are contained in table 4. The results revealed that one-way causation existed between economic growth (INGDP) and foreign direct investment (INFDI) but the causation runs from economic growth (INGDP) to foreign direct investment (INFDI) implying that GDP can cause FDI but not the other way round. One-way causation also existed between economic growth (INGDP) and openness (OPN) but the causation runs from openness (OPN) to economic growth (INGDP) implying also that OPN can cause GDP but not the other way round.. The result further indicated a no causation existed between exchange rates (EXR) and economic growth (INGDP), openness (OPN) as well as foreign direct investment (INFDI), no causation existed between openness (OPN) and foreign direct investment (INFDI).

Table 5: Error Correction Model Parsimonious Results

Dependent Variable: INGDP

Method: Least Squares

Date: 12/19/14 Time: 12:05

Sample (adjusted): 1983 2013

Included observations: 31 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.01945	1.263552	-7.929592	0.0000
LOG(INGDP(-1))	5.395245	1.226271	4.399717	0.0002
LOG(INFDI(-1))	2.593801	1.194540	2.171380	0.0400
LOG(INFDI(-2))	0.603351	0.793026	0.760822	0.4542
LOG(INEXR(-1))	-0.401294	0.192002	-2.090053	0.0474
LOG(INOPN(-1))	0.067797	0.052715	1.286099	0.2107
ECM(-1)	-0.392688	0.185325	-2.118915	0.0406
R-squared	0.988995	Mean dependent var		8.065298
Adjusted R-squared	0.986244	S.D. dependent var		2.086597
S.E. of regression	0.244728	Akaike info criterion		0.218341
Sum squared resid	1.437404	Schwarz criterion		0.542145
Log likelihood	3.615708	Hannan-Quinn criter.		0.323893
F-statistic	359.4792	Durbin-Watson stat		2.059185
Prob(F-statistic)	0.000000			

The results of ECM were contained in Table 5. The coefficient of ECM shows the speed of adjustment to the deviation in the long run equilibrium. The negative value of the coefficient of ECM implies that there is a long run relationship between economic growth (GDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN). The value of the coefficient of ECM (-0.392688) shows that the data will adjust by 39.27 percent to go back to equilibrium in the long run. Precisely, -0.3927 implied that when there is a state of disequilibrium between economic growth (GDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN) will be brought back to equilibrium in at least three years' time. The coefficient of LOGINFDI of (2.593801) shows that 1 percent change in foreign direct investment (FDI) will result to 2.593801percent increase in economic growth (GDP) in Nigeria and the coefficient of LOGINEXR (-0.4013) shows that 1 percent change in foreign exchange rate (EXR) result to 0.4013 percent reduction in economic growth (GDP) in Nigeria and the coefficient of LOGINOPN (0.0678) shows that 1 percent change in openness (OPN) will result to 0.0678 percent increase in economic growth (GDP) in Nigeria.

The R^2 value of 0.9890 shows that 98.90 per cent variation in economic growth (GDP) in Nigeria was explained by the included variables of model; this further implies that the model is fit to explain the relationship between economic growth (GDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN). The Durbin Watson statistics value of (2.059185) shows the absence of autocorrelation; hence the model is non-spurious and can be used for policy purpose.

Table 6: Serial Correlation Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.099651	Prob. F(2,22)	0.9056
Obs*R-squared	0.278312	Prob. Chi-Square(2)	0.8701

The results of Breusch-Godfrey serial correlation LM test are contained in table 6. The results revealed that there is absence of serial correlation in the model which further confirmed the Dubin Watson statistics values in both regression result and ECM results respectively. The null hypothesis of no serial correlation is accepted at 90.56 per cent level of confidence as indicated by the probability value of 0.9056 in Table 6.

Table 7: Heteroscedasticity Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.363719	Prob. F(6,24)	0.2691
Obs*R-squared	7.881710	Prob. Chi-Square(6)	0.2469
Scaled explained SS	5.410735	Prob. Chi-Square(6)	0.4923

The results of Breusch-Pagan-Godfrey Heteroskedasticity test are contained in table 7. The results revealed that there is absence of Heteroskedasticity in the model. The null hypothesis of no Heteroskedasticity is accepted at 26.91 per cent level of confidence as indicated by the probability value of 0.2691 in Table 7.

Table 8: Stability Test Results

Chow Breakpoint Test: 1999

Null Hypothesis: No breaks at specified breakpoints

Varying regressors: All equation variables

Equation Sample: 1981 2013

F-statistic	3.673537	Prob. F(7,17)	0.0134
Log likelihood ratio	28.56127	Prob. Chi-Square(7)	0.0002
Wald Statistic	25.71476	Prob. Chi-Square(7)	0.0006

The Chow breakpoint test is contained in table 8. 1999 was assumed to be the break period because of its significant in the politics of the country. The null hypothesis of no breakpoints is rejected 5 per cent level as indicated by F-statistics value of 3.6735 and the probability value of 0.0134. This implies that economic growth in Nigeria is not stable over the years, especially with the advent of democratic dispensation.

Table 9: Model Specification Test Result

Ramsey RESET Test

Equation: UNTITLED

Specification: INGDP C LOG(INGDP(-1)) LOG(INFDI(-1)) LOG(INFDI(-2))

LOG(INEXR(-1)) LOG(INOPN(-1)) ECM(-1)

Omitted Variables: Squares of fitted values

	Value	df	Probability
t-statistic	4.168428	23	0.0004
F-statistic	17.37579	(1, 23)	0.0004
Likelihood ratio	17.44482	1	0.0000

F-test summary:

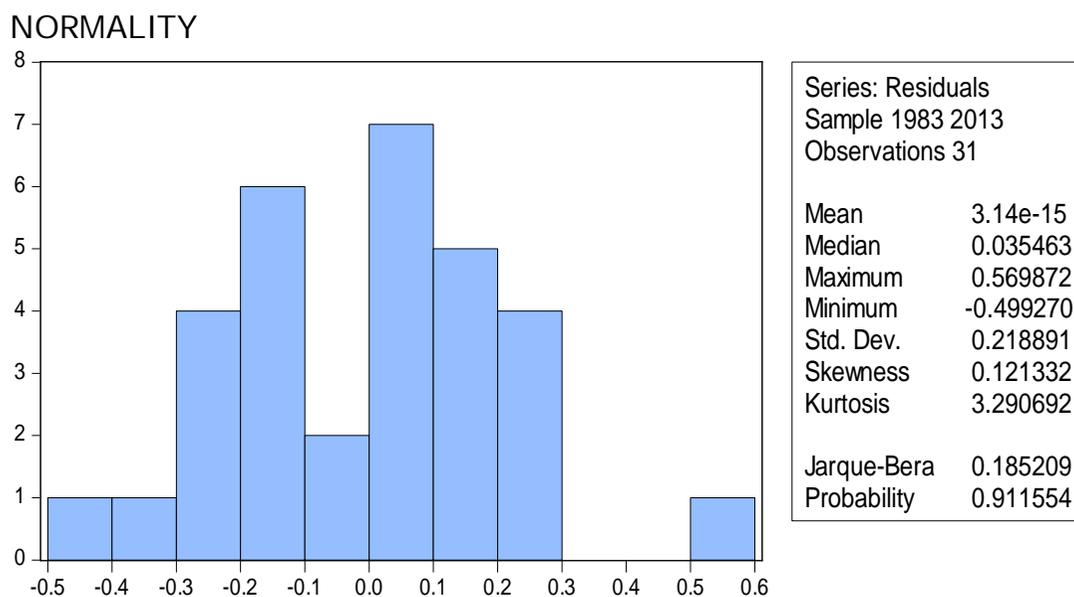
	Sum of Sq.	df	Mean Squares
Test SSR	0.618589	1	0.618589
Restricted SSR	1.437404	24	0.059892
Unrestricted SSR	0.818815	23	0.035601
Unrestricted SSR	0.818815	23	0.035601

LR test summary:

	Value	df
Restricted LogL	3.615708	24
Unrestricted LogL	12.33812	23

The Ramsey RESET Test result is contained in table 9. The result revealed that the model is well and properly specified. The null hypothesis of that the model is mis-specified is rejected at 1 per cent level as indicated by the probability value of 0.0004. This implies that the model relating economic growth, foreign direct investment, foreign exchange rate and openness in Nigeria as presented in this paper is not mis-specified.

Figure 1/Table 10: Normality Test



The Jarque-Bera Test result of normality is contained in Figure 1/table 10. The result revealed that the residuals of the data are normally distributed. The null hypothesis of normality of the residuals of the data is accepted at 91.16 per cent confidence level as indicated by the probability value of 0.9116 and Jarque-Bera value of 0.1852 which is greater than zero.

5.0 Conclusion and Recommendations

This paper investigates the relationship between economic growth (GDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN) in Nigeria.

The properties of time series variables were examined through the application of Augmented Dickey-Fuller and Phillip-Perron technique in testing the unit root property of the series, Granger causality test of causation between the variables, Engel-Granger ECM technique in testing the long run adjustment speed of the model, Breusch-Pagan-Godfrey test of heteroskedasticity, Breusch-Godfrey serial correlation test, Ramsey RESET test of mis-specification, Chow Breakpoint test, after which Jarge-Bera test of normality was used. The results of the OLS revealed that foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN) impacted positively on economic growth (GDP) in the Nigeria. The results of unit root suggest that all the variables in the model are stationary at first difference $d(1)$.

The results of Causality suggested that one-way causation existed between economic growth (INGDP) and foreign direct investment (INFDI) but the causation runs from economic growth (INGDP) to foreign direct investment (INFDI) implying that GDP can cause FDI but not the other way round. One-way causation also existed between economic growth (INGDP) and openness (OPN) but the causation runs from openness (OPN) to economic growth (INGDP) implying also that OPN can cause GDP but not the other way round.. The result further indicated a no causation existed between exchange rates (EXR) and economic growth (INGDP), openness (OPN) as well as foreign direct investment (INFDI), no causation existed between openness (OPN) and foreign direct investment (INFDI). The ECM result revealed the existence of long run relationship between economic growth (INGDP), foreign direct investment (FDI), foreign exchange rate (EXR) and openness (OPN).

The speed of adjustment was found to be at least three years for the long run equilibrium. This paper found that, there is no serial correlation among the error values, no mis-specification of the model, and also that the variables of the are not stable throughout the period of the study and the break was found to be 1999 when the current democratic dispensation started. The result further revealed that the residuals of the model are normally distributed which make it possible for the results of this paper be used for policy purposes. In conclusion, this paper found a positive and significant relationship between economic growth and foreign direct investment in Nigeria. Therefore, this paper recommends that concerted effort be made by policy makers and relevant authorities to formulate policies aim at creating a conducive investment environment so that Nigeria can be better destination for foreign investment Policy makers should also take step to ensuring foreign exchange stability and increase openness of the economy so as to achieve meaningful economic growth.

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