Cointegration and Causality between Return on Investment and Foreign Direct Investment in Nigeria

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Abstract

Foreign direct investment (FDI) inflows into the Nigerian economy has not been stable. Notwithstanding this fluctuation, the country is still one of the largest destinations of FDI inflows in Africa. It is empirically unclear how return on investment affects FDI inflows in Nigeria. This paper investigates the effect of return on investment on FDI in Nigeria using yearly data for the period 1971 to 2015 by means of the (ARDL) approach. The study reveals the existence of a cointegration relationship among return on investment, electricity infrastructure, official exchange rate, real GDP growth, political instability, and FDI net inflows in Nigeria, It showed that both short-run and long-run relationships exist between return on investment and FDI net inflows, while both electricity and real GDP growth only has a long run relationship with FDI inflows. The Granger Causality Test reveals a unidirectional causality running from return on investment to FDI net inflows and not vice versa. The paper submits that return on investment, electricity infrastructure, and real GDP growth, exerted a positive and statistically significant influence on FDI net inflows in Nigeria. This shows they are important factors in determining FDI inflows. However, both official exchange rate and political instability did not have any significant effect on FDI net inflows both in the short-run and in the long-run. Thus, it is recommended that the Nigerian government should sponsor and host programs that will create the awareness that Nigeria is an investors' haven.

Keywords: Foreign direct investment (FDI), return on investment, ARDL, Granger causality, Nigeria.

1. Introduction

Foreign direct investment (FDI) is an investment made by investors in a different country. According to Organization for Economic Co-operation and Development (OECD) (2008) foreign direct investment can be inflow, to a benefited country, or outflow, from an investing country. It is a cross-border investment made by the citizen of one country, in an enterprise of another country with the objective of obtaining a lasting interest in the enterprise (OECD, 2008). The lasting interest implies the existence of a long-term relationship between the direct investor and the enterprise with a significant degree of influence on the management of the enterprise (Ridgeway, 2004). The basic criterion used for ownership is at least 10% of the voting power, representing the influence by the investor (Ridgeway, 2004). FDI net inflows is defined by World Bank as the value of inward direct investment made by non-residents investors in a receiving country (World Bank, 2016). FDI has become an important aspect of economic development in Nigeria and all developing countries due to the acute shortage of required capital for investment in education - particularly research and development, manufacturing, agriculture, new technology, power sector, health care systems, and shelter.

Since the 1970s, FDI inflows into the Nigerian economy has not been stable. In 1970 the country received $205 million in FDI inflows. The figure climbed to $610.5 million in 1987 and the next year, in 1988, it drastically reduced to $378.8 million (World Bank, 2017). This has been the trend until now. Notwithstanding this fluctuation in FDI inflows into the Nigerian economy, the country is still one of the largest destinations of FDI inflows in Africa. In 1997, Nigeria received the largest FDI inflows in African (Odenthal and Zimny, 1999), while in 2014, Nigeria was the fifth recipient of the largest FDI inflows in the continent (UNTCAD, 2015). Nigeria FDI inflows reached $8.8 billion in 2011 (World Bank, 2017).

Due to this, various empirical studies have research into the determinants of FDI inflow in Nigeria. However, how return on investment affects FDI inflows in Nigeria has not been fully explored. This study examines the relationship between foreign direct investment (FDI) net inflows and return on investments in Nigeria. This paper seek to answer these questions: Is return on investment a determinant of FDI in Nigeria? If yes, is there a long-run relationship between them? And, what is the direction of causality between the two variables? Return on investment is the gains expected to be benefited by an investing citizen of another country. This is expected to be high because Nigeria is a capital scarce country.

2. Literature Review

Various literature and empirical studies has made efforts to identify major factors or determinants of FDI in Nigeria. Results from this literature is inconclusive, due to different data sources, different periods under review, different methodologies and variables estimated. Even studies with the same variables do not usually come up with the same results. Wafure and Nurudeen (2010) used error correction techniques to estimate the determinants of FDI as market size of the host country, deregulation, political regime, exchange rate, and infrastructure. The authors used annual secondary data collected from Central Bank of Nigeria for the period 1977 to 2006. They concluded that deregulation, political regime and market size have

a positive effect on FDI in Nigeria. Exchange rate negatively impacts foreign direct investment, while openness of the economy, inflation, and infrastructure are statistically insignificant.

Oba and Onuoha (2013) employed the ordinary least square method to analyze how variables such as real GDP, inflationary levels, openness of trade, electricity consumption, and transport and communication have determined FDI in Nigeria between 2001-2010, a ten-year period. The paper concluded that real GDP, electricity consumption, and inflation have a negative relationship with FDI and this calls for policy reconsiderations, while openness of trade, transport and communication positively influenced FDI. Ogunleye (2014) made use of qualitative techniques to examine factors that affect foreign direct investment; in a case study of Nigeria, the paper identified adequate infrastructural facility as one of the most important factors that attracts FDI to Nigeria.

Using least square regression approach, Obadan (1982) established that most important factors that determined FDI in Nigeria are market size, trade policies and raw materials, However, Anyanwu (1998) employed cointegration techniques and claimed that domestic investment, domestic market size or GDP, openness of the economy, the structural adjustment program, and indigenization policy are the major determinants of net FDI inflows in Nigeria and they represent significant long-run and short-run determinants of net foreign direct investment. Offiong and Atsu (2014), by using multiple regression analysis tested the functional relationship that exists between FDI and the following variables: GDP, wage rate, interest rate, and relative openness index. The paper revealed that GDP and real wage rate significantly affect FDI inflows, while the relative openness index and lending rate have no impact on FDI inflows in Nigeria. The results showed that improvement in GDP and an increase in wage rate would lead to an increase in foreign direct investment inflows. Ekpo (1997), emphasized the importance of a stable political regime, real income per capita, rate of inflation, world interest rate, and credit rating and debt service on FDI inflow to Nigeria. He concluded that changes in these factors explained the variance of FDI inflow to Nigerian economy.

Moses et al. (2013), examined the impact of domestic investments on FDI inflows in Nigeria from 1970 to 2009. The study employed a decomposed, single-linear econometric model estimated by the OLS methodology, and established that domestic investments (both private and public), human capital, and market size have a negative influence on FDI inflows, while trade openness and natural resources positively impact foreign direct investment inflows in Nigeria. Maghori (2014), employed error correction modeling technique on the annual time series data for the period 1970 to 2010, where the data were sourced from the CBN statistical bulletin (2009). The results show that inflation rate, debt-GDP ratio, and openness of the economy have a significant negative effect on the FDI. However, GDP (size of the economy), fiscal deficit ratio, and real exchange rate have a significant positive impact on FDI in the economy. It concluded that debt-GDP ratio is the major factor that influences FDI both in the short and the long-run.

This paper is contributing to a body of knowledge by estimating the cointegration (the long-run relationship) and causality between return on investment and FDI in Nigeria. For robustness, the following variables were added as control: electricity as a proxy for infrastructure, official exchange rate, real GDP growth, and political instability as a dummy variable.

2.1. The importance of foreign direct investment to Nigeria economy

Nigeria is a developing country where a considerable number of the people live below the poverty line. World Bank 2014b (as cited by NHDR for Nigeria, 2016) use General Household Survey (GHS) panels to compute the new poverty rates in Nigeria and concludes that in 2012/2013, 33.1% of the population, that is 56 million, are poor. This is partly due to an acute shortage of capital for investment. To eliminate poverty, capital is very important to stimulate investment, increase productivity, and raise per capita income, thereby stimulating economic growth and development. It becomes imperative to source capital outside the shores of the country in the form of foreign direct investment (FDI). Therefore, the importance of FDI in meeting the capital needs of the Nigerian economy can never be over emphasized. According to Wafure and Nurudeen (2010), FDI provides capital for investment, enhances job creation and managerial skills, and possibly technology transfer.

Offiong and Atsu (2014) stated that FDI is an engine of growth. It provides investment capital, boosts competition, and aids local firms in adapting more efficient technology and management styles in their operations (Offiong and Atsu, 2014). It also serves as a source of infrastructure, employment generation, resource utilization and access to the international markets, as well as managerial and technological transfers (Offiong and Atsu, 2014). FDI should be seen as a factor that plays a key role in the growth and development process of developing nations, Nigeria inclusive, whose human and material resources are underemployed or not fully employed (Oba and Onuoha (2013). De Gegorio (2003), maintains emphatically that given the unpredictability and volatilities of aid flows, the low share of Nigeria in world trade, the high volatility of short-term capital flows, and the low savings rate that characterizes the Nigerian economy, along with the desired increase in investment, this has to be achieved through an increase in FDI, at least in the short-run.

Due to the important role played by the FDI in an economy, Nigerian government has been making frantic efforts to increase its share through various reforms. These include: deregulation of the economy, the new industrial policy of 1989, the establishment of the Nigeria Investment Promotion Commission (NIPC) in early 1990s, and the signing of the Bilateral

Investment Treaties (BITs) in the late 1990s. Others include the establishment of the Economic and Financial Crime Commission (EFCC) and the Independent Corrupt Practices Commission (ICPC) to deter financial crime (Wafure and Nurudeen, 2010). All these reforms were to make the business environment conductive and attractive for foreign investors in Nigeria.

Despite these reforms, FDI net inflows in Nigeria remained perpetually low in the 1980s compared to other developing countries. Nevertheless, the influx of foreign direct investment has continued to increase from 1990 to 2003 where it rose from $587 million in 1990 to $2.05 billion in 2003 (World Bank, 2017). Though these figures were positive from the 1990s, Asiedu (2005) critically accessed the country with her huge natural resource base and large market size, concluding that Nigeria is qualified to be a recipient of more FDI in Africa. Presently, Nigeria is one of the top three leading African countries that consistently received foreign direct investment in the past decade. However, the level of FDI attracted by Nigeria is mediocre compared with its resource base and potential need. Oyatoye et al. (2011) claimed that special incentives should be offered to attract FDI to Nigeria, because it produces externalities in the form of technology transfer and spillovers.

3. Data and Methodology

3.1. Model specification

A multiple regression model was used to estimate the relationship between return on investment and foreign direct investment. Official exchange rate, real GDP growth rate, and electricity are control variables, while political instability is a dummy variable. According to the literature (Wafure and Nurudeen, 2010) and (Asiedu, 2002) the economic model for foreign direct investment is specified thus:

$$FDI = f(RETURN, ELECT, OFFEX, GDPGROWTH, POLINST)................(1)$$

Where FDI is foreign direct investment, ELECT is electricity, OFFEX is official exchange rate in Nigeria, GDPGROWTH is the real gross domestic product growth rate in Nigeria, and POLINST is political instability. The above equation (1) can be specified as an econometric model as below:

$$FDI_t = \beta_0 + \beta_1 RETURN_t + \beta_2 ELECT_t + \beta_3 OFFEX_t + \beta_4 GDPGROWTH_t + \beta_5 POLINST_t + \varepsilon_t........(2)$$

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the coefficients of respective variables, β_0 is the constant, t is time, and ε is the error term. Based on the model, the expected signs of the coefficients are $\beta_1 > 0, \beta_2 > 0, \beta_3 < 0, \beta_4 > 0, \beta_5 < 0$. The variables included in the above model is based on literature, economic theory, availability of data and their significance in the model chosen for the study.

3.2. Data

Annual secondary data from World Bank Indicator (WDI, 2017), International Monetary Fund (IMF, 2016), and CBN Annual Reports and Statistical Bulletins were used for this research work for the period 1971 to 2015. The variables used in this study are as follows: Foreign direct investment net inflows (FDI), return on investment (RETURN), electricity (ELECT), official exchange rate (OFFEX), real GDP (GDPGROWTH) where GDP is Gross Domestic Product, and political instability (POLINST).

3.2.1. Brief description of the variables

Dependent variable: *Foreign Direct investment (FDI)*

In accordance with the literature, foreign direct investment net inflows (% of GDP) is used to measure the dependent variable: net inflows of FDI in Nigeria (Asiedu, 2002).

Independent Variables:

Return on Investment

This captured the expected rate of return to investors for investing in Nigeria. It is assumed that the higher the expected rate of return the higher the investment foreign investors will make in Nigerian economy. According to Asiedu (2002), Nigeria is a capital scarce country. There is an acute shortage of capital needed for investment in the country and according to the literature, the marginal product of capital is equal to the return on capital, therefore investment in capital scarce countries will generates higher returns (Asiedu, 2002:110-111) and (Alavinasab, 2013). This shows that higher rate of return should be expected for investors in the country. As is revealed in the literature, countries with a low per capita income, have higher returns on investment, while high per capita income countries, have low return on investment. Thus, there is an inverse relationship between GDP per capita and return on investment (Asiedu, 2002:110-111), (Alavinasab, 2013), (Onyeiwu, 2003), and (Jaspersen et al., 2000). Therefore, the inverse of the log of real GDP per capita: Log (1/real GDP per capita) will

be used to measure the rate of return on investment (Asiedu, 2002:110-111). Nigeria has a low per capita income, which means that return on investment should be high.

Electricity

Electric power consumption –kWh per capita (ELECT) is used as a proxy for levels of infrastructure in Nigeria, with the assumption that higher levels of infrastructure as captured by improvement in electricity generation, transmission, and distribution will be a catalyst for higher investment in Nigeria. Using electricity as a measure of infrastructure is consistent with the literature (Oba and Onuoha, 2013).

Official Exchange Rate

Official exchange rate (LCU per US$, period average) is used to measure the effect of official exchange rate on FDI in Nigeria. Official exchange rate is one of the major factors that influence foreign direct investment in Nigeria, although there is no consensus as to its effect (Wafure and Nurudeen, 2010).

Real GDP Growth

Real GDP growth (real Gross Domestic Product growth) annual percent change capture the growth rate of the economy and its market attractiveness to investors (Asiedu, 2002). Thus, improvement or higher real GDP growth should make the economy attractive to investors.

Political Instability

Political instability was captured as a dummy variable. Years of military rule is represented by 1, while democracy rule is represented by 0. This is one of the major factors that influences foreign direct investment in Nigeria (Ekpo 1997) and (Wafure and Nurudeen 2010). After reviewing various literature there is no consensus on how political instability affects the Nigerian economy.

3.3. Estimation procedure
3.3.1. Cointegration test

To carry out the bounds test procedure for cointegration, a restricted version of the ARDL model is used to test for the long-run relationship between foreign direct investment and its determinants.

According to Pesaran and Pesaran (1997), Pesaran and Shin (1999), and Pesaran et al. (2001) ARDL bounds test is an alternative cointegration technique to Johansen's cointegration technique in determining the long-run relationship between variables. The following are the advantages ARDL has over Johansen's technique and why it is used in the paper: ARDL give more statistical significance when used in small samples; ARDL can be used whether the independent variables are I (0) or I (1). This eliminates the pre-testing problems associated with standard co-integration which mandates that variables should already be classified into I(0) or I(1); lastly, ARDL is applicable when the independent variables are endogenous and is sufficient to simultaneously correct, for residual serial correlation (Tang, 2006). Thus, equation (2) was remodeled as a conditional ARDL as:

$$\Delta FDI_t = \alpha_0 + \beta_1 FDI_{t-1} + \beta_2 RETURN_{t-1} + \beta_3 ELECT_{t-1} + \beta_4 OFFEX_{t-1} + \beta_5 GDPGROWTH_{t-1} +$$

$$\beta_6 POLINST_{t-1} + \sum_{i=1}^{p} \phi_{1i} \Delta FDI_{t-1} + \sum_{t=1}^{p} \phi_{2i} \Delta RETURN_{t-1} + \sum_{i=1}^{p} \phi_{3i} \Delta ELECT_{t-1} + \sum_{i=1}^{p} \phi_{4i} \Delta OFFEX_{i-1} +$$

$$\sum_{t=1}^{p} \phi_{5i} \Delta GDPGROWTH_{t-i} + \sum_{t=1}^{p} \phi_{6i} \Delta POLINST_{t-1} + \varepsilon_t ....(3)$$

In the equation (3), the null hypothesis is: No long-run relationship exist among the variables, while the alternative hypothesis is: There is long-run relationship among the variables which is represented by: F_{FDI} (FDI|RETURN, ELECT, OFFEX, GDPGROWTH, POLINST). The null hypothesis (H_0) and the alternative hypothesis (H_a) are stated as:

$H_{0:} \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = 0$

$H_{a:} \beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq 0$

3.4. Long-run and short-run dynamics.

After proving the existence of cointegration among the variable, we have to estimate the following ARDL [p, q1, q2, q3, q4, q5] model to obtain the long-run coefficients.

$$FDI_t = \alpha_0 + \sum_{t=1}^{p}\beta_1 FDI_{t-1} + \sum_{i=0}^{q_1}\beta_2 RETURN_{t-1} + \sum_{i=0}^{q_2}\beta_3 ELECT_{t-1} + \sum_{i=0}^{q_3}\beta_4 OFFEX_{t-1} +$$

$$\sum_{i=0}^{q_4}\beta_5 GDPGROWTH_{t-1} + \sum_{i=0}^{q_5}\beta_6 POLINST_{t-1} + v_t \dots\dots\dots\dots(4)$$

3.4.1. Short-run dynamics

The dynamic relationship among cointegrated variables can be specified by an error correction representation ECT (error correction term). This is computed from the long-run equations and must be incorporated in order to capture both the short-run and the long-run relationships (Engle and Granger, 1987). ECT shows the speed of adjustment to long-run equilibrium in the dynamic models and it is expected to be negative and statistically significant. The negative sign shows that any shock that occurs in the short-run will be corrected in the long-run. Thus, the greater the coefficient of the ECT in absolute terms, the faster the convergence to equilibrium. Thus, the unrestricted ARDL error correction model of equation (3) is represented as:

$$FDI_t = \alpha_0 + \sum_{t=1}^{p}\phi_{1i}\Delta FDI_{t-1} + \sum_{i=0}^{q_1}\phi_{2i}\Delta RETURN_{t-1} + \sum_{i=0}^{q_2}\phi_{3i}\Delta ELECT_{t-1} + \sum_{i=0}^{q_3}\phi_{4i}\Delta OFFEX_{t-1} +$$

$$\sum_{i=0}^{q_4}\phi_{5i}\Delta GDPGROWTH_{t-1} + \sum_{i=0}^{q_5}\phi_{6i}\Delta POLINST_{t-1} + \psi ECT_{i-1} + v_t \dots\dots\dots(5)$$

Δ is difference operator, ECT_{t-1} is error corrected term lagged one period. $\phi_1,\phi_2,\phi_3,\phi_4,\phi_5,\phi_6$, are the elasticities of the

respective variables, ψ is the speed of adjustment, α_0 is the drift component, t is time, and V_t is the stochastic error term. The residuals from the cointegration equation lagged one period is stated as:

$$ECT_t = FDI - \alpha_0 - \sum_{t=1}^{p}\phi_{1i}\Delta FDI_{t-1} - \sum_{i=0}^{q_1}\phi_{2i}\Delta RETURN_{t-1} - \sum_{i=0}^{q_2}\phi_{3i}\Delta ELECT_{t-1} - \sum_{i=0}^{q_3}\phi_{4i}\Delta OFFEX_{t-1} -$$

$$\sum_{i=0}^{q_4}\phi_{5i}\Delta GDPGROWTH_{t-1} - \sum_{i=0}^{q_5}\phi_{6i}\Delta POLINST_{t-1}\dots\dots\dots(6)$$

4. Empirical results.
4.1. Results of unit root test

To test for stationarity properties of the data, Augmented Dicky-Fuller (ADF) test was conducted on the variables. Though ARDL bound test for cointegration does not mandate the pretesting of the variables for unit roots, it is important to conduct unit root tests to ascertain that the variables are not integrated of an order higher than one I (1).

The results in Table 1 shows that all the variables are non-stationery at levels but they are stationary at first difference I (1), therefore we can proceed to test for cointegration.

4.2. Results for the bounds test for cointegration

According to Pesaran, Shin, and Smith (2001), it is important to confirm the existence of a long-run relationship between the variables by employing the bound testing approach to cointegration. The variables are integrated of order one I (1), thus the cointegration of the variables is a required condition for the presence of a long-run relationship. Table 2 shows the results of the bound test, the joint null hypothesis of lagged level variables (variable additional test) of the coefficient being zero (no cointegration) is rejected at 1 percent level of significance. The null hypothesis was rejected because the calculated F-Statistic value of 4.7103 (i.e. $F_{FDI}(.) = 4.7103$ exceeds the upper bound critical value of 4.15 at 99% level. This shows there is a long-run relationship between foreign direct investment and its determinants.

Table 1: Results of the Unit Root Test: ADF Test

Levels			First Difference			
Variables	ADF-Statistic	Lag	Variables	ADF-Statistic	Lag	I(0)
FDI	-2.190423[0.2126]	2	ΔFDI	-6.131474[0.0000]***	1	I(1)
RETURN	-0.378777[0.9037]	1	ΔRETURN	-3.903756[0.0044]***	1	I(1)
ELECT	-0.941467[0.7652]	1	ΔELECT	-6.531905[0.0000]***	1	I(1)
OFFEX	0.814814[0.9932]	1	ΔOFFEX	-3.953280[0.0038]***	1	I(1)
GDPGROWTH	-2.031948[0.2726]	2	ΔGDPGRWOTH	-9.317114[0.000]***	1	I(1)

Note: No test of unit root on POLINST because it is a dummy variable.

Source: Author's computation.

Table 2: Results of Bounds Tests for Cointegration (intercept only)

Critical value bounds test		90% Level		95% Level		99%Level	
k	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)	
5	2.08	3	2.39	3.38	3.06	4.15	
Dependent Variable							
F_{FDI} (FDI|RETURN, ELECT, OFFEX, GDPGROWTH, POLINST).				F-Statistic 4.710307			

Source: Computed using Eviews 9.0 Package

4.3. Results of the long run relationship

The results displayed in Table 3 shows that all the estimated coefficients have prior expected signs except political instability. The results indicate that return on investment is statistically significant at 1 percent significance level implying that a 1 percent increase in return on investment will increase FDI net inflows by 0.078 percent. The positive effect of return on investment on FDI net inflows is consistent with the literature (Asiedu, 2002), (Alavinasab, 2013), and (Onyeiwu, 2003). This lays credence to the fact that high return on investment will lead to an increase in FDI net inflows in Nigeria. This shows that Nigeria, as a developing country is an investors' haven. The more the investment, the higher the returns. This is a great catalyst for Nigeria to attract the needed capital for development and a good incentive for foreign investors to invest in the country. The awareness that return on investment is high in Nigeria, can actually go a long way to solve the problem of scarce capital for investment, and spur the country in the right direction of development and accelerated growth.

In addition, the coefficient of electricity is positive and statistically significant at 10 percent. This indicates that improvement in electricity (a proxy for levels of infrastructure) will lead to more FDI net inflows in Nigeria. The positive influence infrastructure as on FDI is confirmed by Alavinasab (2013). The results indicates that electricity is statistically significant at 10 percent significance level, that is, a 1 percent increase in electricity will increase FDI net inflows by 0.045 percent. Cheap, stable and available electricity to the general public will go a long way to stimulate FDI net inflows in Nigeria. Electricity is one of the major components of the cost of production, non-availability, high cost and non-stable electricity over the years has greatly increased the cost of production, thereby discouraging FDI inflows in Nigeria.

This paper shows that improvement in electricity supply will encourage foreign investors to invest in the country. Even with the abysmal supply of electricity in Nigeria, its positive effect is clearly shown in this paper. Therefore, to encourage foreign investors, the Nigerian government should put more efforts in improving the power sector. Recently, the Nigerian government privatized the power sector and it is too early to see the effects. This may be a policy move in the right direction, but this move did show that the government is fully aware of the inefficiency in the sector and is looking for ways to improve it. Again, it indicates that the Nigerian government recognized the importance of the power sector to the development of the economy.

Table 3: Estimated Long-Run Coefficients using the ARDL Approach

ARDL [1,0,1,04,0] selected based on HQ		Dependent Variable FDI		
Regressor	Coefficients	Standard Error	T-Ratio	P –values
Constant	55.06232	13.93601	3.951082	[0.0005]***
RETURN	7.894578	1.924619	4.101891	[0.0003]***
ELECT	0.045747	0.023363	1.958122	0.0599*
OFFEX	-0.002333	0.014964	-0.155929	[0.8772]
GDPGROWTH	0.278235	0.141966	1.958122	[0.0597]*
POLINST	1.095058	1.279333	0.855958	[0.3990]

Source: Author's computation

Furthermore, the coefficient of real GDP growth is positive and statistically significant at 10 percent. This indicates that an increase in real GDP growth will lead to more FDI net inflows in Nigeria, as confirmed by Asiedu (2002). The results indicate that real GDP growth is statistically significant at a 10 percent significance level that is a 1 percent increase in real

GDP growth, which will increase foreign direct investment net inflows by 0.27 percent. Real GDP growth indicates the Nigerian market's attractiveness and an increase in real GDP growth, showed that purchasing power in Nigeria is improving, and more people will be able to afford both domestically produced and imported goods.

Both official exchange rate and political instability are not statistically significant, but it is worth noting that political instability does not have the expected sign. This is due to the peculiar nature of the Nigerian economy: Nigeria is a low per capita income country and its return on investment is expected to be high; and the country is one of the major exporters of crude oil in Africa. This is an extractive industry and it is very lucrative. Again, this confirms that the return on investment in Nigeria is very high compare to the risk factor (political instability) and the risk factor is not high enough to discourage investors.

4.4. Granger-Causality Test

After cointegration among the variables is established, Pairwise Granger Causality Test was conducted to measure the linear causation between foreign direct investment and return on investment. Table 4 shows the results of the test.

Table 4: Results of Bivariate/Pairwise Granger causality test

Null Hypothesis	F-Statistic	Prob
RETURN does not Granger Cause FDI	3.74931	0.0080***
FDI does not Granger Cause RETURN	0.36827	0.8923

*Note: *, **, and *** denote rejection of Null Hypothesis at 10%, 5%, and 1% levels of significant.*
Source: Conducted using Eviews 9.0 package.

The Pairwise Granger Causality Test (results in Table 4) rejects the null hypothesis that RETURN does not Granger cause FDI net inflows at 1% level of significant. The rejection of the null hypothesis indicates that return on investment (RETURN) causes changes in FDI net inflows in Nigeria. However, the null hypothesis that FDI net inflows does not does not Granger cause return on investment (RETURN) cannot be rejected. The results of the Pairwise Granger Causality Test confirms unidirectional causality from return on investment to FDI net inflows in Nigeria.

4.5. Results of the short run dynamic model

After estimating the long-run cointegrating model, the paper modeled the short-run dynamic relationship among the variables within the ARDL framework. That means that the lagged value of all levels of variables (a linear combination is indicated by ECM_{t-1}), the error-correction term is preserved in the ARDL model. Table 5 displays the results of the estimated error-correction model of foreign direct investment in Nigeria using the ARDL technique. The model is selected based on Hannan-Quinn criterion (HQ).

Table 5: Estimated Short-Run Error Correction Model using ARDL Approach

ARDL [1,0,1,0,4,0] selected based on HQ		Dependent Variable FDI		
Regressor	Coefficients	Standard Error	T-Ratio	P –values
Constant	44.9417	13.0777	3.43651	[.002]***
ΔRETURN	6.3270	1.8174	3.4814	[.002]***
ΔELECT	.036610	.029389	1.2457	[.223]
ΔOFFEX	-.0016257	.013822	-.11761	[.907]
ΔGDPGROWTH	.010230	.076166	.13432	[.894]
ΔPOLINST	.53248	1.1516	.46237	[.647]
ECM(-1)	-0.78094	.16343	-4.7784	[.000]***
R-squared 0.53967		R-Bar-squared .35882		
		F-Stat. F(9,30) 3.6474 [.004]		

Source: Author's computation

The results from the ARDL model shown in Table 5 indicated that the signs of the estimated coefficients for all the variables are the same, both in the short-run and in the long-run. Furthermore, return on investment is highly statistically significant at 1 percent significance level in the short-run, as it was in the long-run. That is, 1 percent increase in return on investment will increase FDI net inflows by 0.063 percent. This shows the importance of return on investment in attracting FDI net inflows both in the short-run, as well as the long-run. This indicates that the government should focus more on policies that bring awareness to investors that Nigeria is an investor's haven. None of the control variables are statistically significant in the short-run. Again, this means that the long-run effect of these variables is of very importance in determining foreign direct investment net inflows into the Nigerian economy.

Moreover, the results in Table 5 indicates the expected negative sign of the ECM_{t-1} and is highly significant at 1 percent significance level. This is a confirmation of the presence of the cointegration relationship among the variables. The error correction term is the rate of adjustment to restore equilibrium in the dynamic model following a disturbance. The

ECM's estimated coefficient is -0.78, which means that any deviation from the long-run equilibrium due to a short-run shock is corrected by 78 percent at the end of each year.

4.6. Evaluation of the models
Table 6 shows that the model does not suffer from serial correlation, heteroskedasticity, and the residuals are normally distributed.

**Table 6: Diagnostic test for FDI model**

Diagnostic	Statistic	Conclusion
Heteroskedasticity Test- Breusch-Pagan-Godfrey	F-Statistic 1.194126[0.3337] Obs*R-squared 12.78144[0.3079]	No Heteroskedasticity
Serial Correlation LM Test- Breusch-Godfrey Serial Correlation LM Test	F-Statistic 1.385593[0.2675] Obs*R-squared 7.440067[0.1144]	No Serial Correlation
Multivariate Normality	Jack-Bera test 2.719412 P-value [0.256736]	Residuals are normal.

Source: Author's computation

4.7. Stability Tests
Stability tests are conducted to show whether the parameter estimates are stable over-time (Pesaran and Pesaran, 1997). This test is suitable and advisable in a time series data when we are uncertain when we will have structural change. The Cumulative Sum (CUSUM) and Cumulative Sum of Squares (CUSUMQ) are used to test for the stability of the parameters.
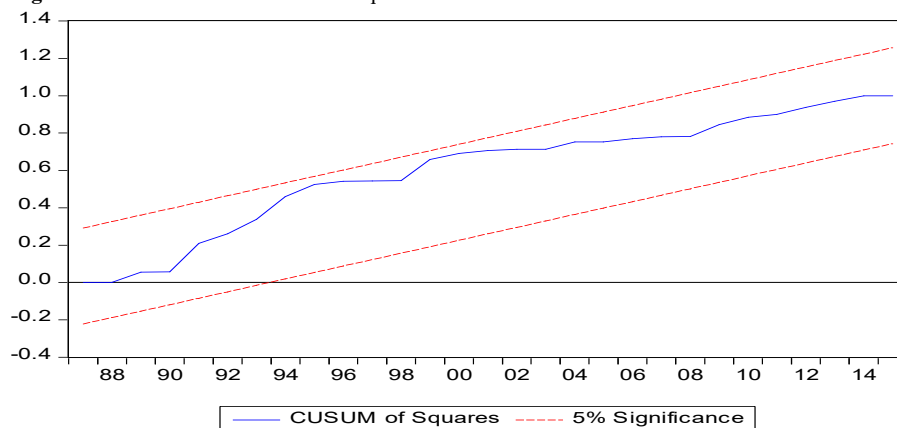
Figure 1: Plot of Cumulative Sum of Recursive Residuals
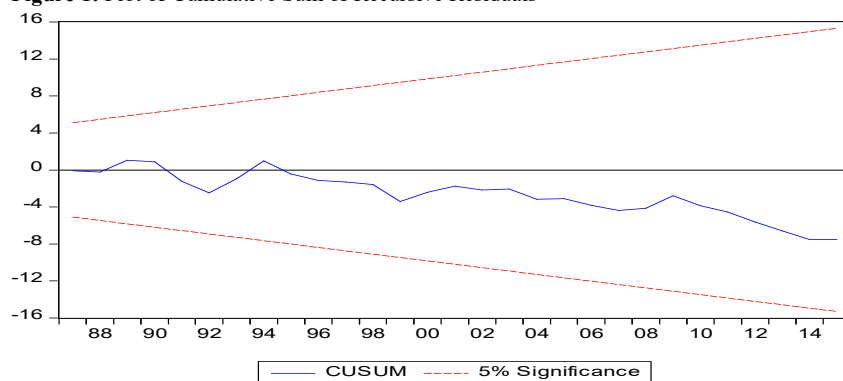
The vertical axis shows the residuals and the horizontal axis shows the years. The critical bounds at 5% is represented by the straight lines.
Source: Generated using Eviews 9.0 Package.

Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals

The vertical axis shows the residuals and the horizontal axis shows the years. The critical bounds at 5% is represented by the straight lines.

Source: Generated using Eviews 9.0 Package.

The CUSUM and CUSUMSQ statistics are plotted at the critical bounds of 5% levels of significance. If these plots remain inside the critical bounds, the null hypothesis that all the coefficients are stable will not be rejected (Pesaran et al., 2001). Figures 1 and 2, indicate that the CUSUM and CUSUMSQ residuals are within the 5% critical boundaries. This shows that the two plots confirm the stability of the coefficients.

5. Conclusion and Recommendation

The cointegration and causality between return on investment and foreign direct investment (FDI) net inflows in Nigeria has been examined. This paper established that both short-run and long-run relationships exist between return on investment and FDI net inflows in Nigeria, with the error correction process converging monotonically to the equilibrium path relatively quickly at 78 percent. Furthermore, this study confirmed a unidirectional causality from return on investment to FDI net inflows in Nigeria and not vice versa, with the model indicating no evidence of any structural instability.

Therefore, we can rightly conclude that return on investment has a positive impact on FDI net inflows in Nigeria. Higher return on investment will lead to more FDI net inflows. This paper has shown that a high return on investment is a catalyst for more FDI net inflows to provide desperately needed capital for development and accelerated growth. Again, it has shown the importance of the power sector to the development of the economy. Improvement in electricity will greatly motivate foreign investors to invest in the economy. Nigerian growing market attractiveness, as confirmed by the positive relationship between its real GDP growth and FDI net inflow, will certainly encourage more foreign investors to invest in the country.

The Nigerian government needs to sponsor and host programs which can create the awareness that the country is an investors' haven, e.g. international business conventions. Macroeconomic policies of the government should be strengthened to improve its performance, thereby leading to an increase in Nigerian real GDP growth. Lastly, the Nigerian government should put more effort in improving the power sector. This paper indicates that return on investment is unusually high in Nigeria due to scarce capital. Therefore, encouraging more FDI inflows in Nigeria will generate a high return on investment and at the same time lead to accelerated growth and development of the economy. Promising area for future research is sector-specific FDI. The economy is made up of various sectors, each sector attracts various levels of FDI inflows. Thus, upcoming research can examine which sector generates highest return on investment on FDI net inflows into the Nigerian economy.

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