

Determinants of Foreign Direct Investment in Nigeria: An ARDL Analysis

Eugene Iheanacho (PhD)

Department of Economics, Abia State University, Uturu, P.M.B. 2000, Uturu, Abia State, Nigeria.
E-mail: dreugene.iheanacho@yahoo.com

Abstract

This study examines the determinants of FDI in Nigeria over the period of 1981 to 2015 using the ARDL approach to cointegration analysis. Four macroeconomic variables are employed: oil prices, real GDP per capita, exchange rate, inflation rate over the study period. The results suggest that the long and short run effects of the selected macroeconomic variables in determining the FDI inflow in Nigeria over the period. First, in the long run exchange rate and inflation rate are found to be positive and statistically significant on FDI. Furthermore, the negative and significant position of market size (RGDP) and oil price are found to coexist in the short and long interaction of FDI and some of the selected variables. In sum, all other variables are found to be statistically significant in attracting FDI in Nigeria both at the short and long run. This study has some policy implications. Policies aimed at improving and reducing macroeconomic instability will be beneficial for FDI flows to the continent. Finally, policies aimed at attracting FDI are necessary because higher FDI flows can cause more banking and financial development. Finally, government should allow the exchange rate to depreciate further since it will reduce the dollar price of some ailing indigenous industries, thereby attracting more foreign investment in the form acquisition or mergers.

Keywords: FDI, ARDL, Macroeconomic variables

1.1 Introduction

The growing interest in foreign direct investment is driven by the perceived opportunities that can be derived from the utilization of foreign capital injection into the economy to add to domestic savings and promote economic growth and development (Aremu, 2005). Owing to the above statement, UNCTAD (2014) opines that foreign direct investment inflow have accounted for more than forty percent of external development finance to developing and transition economies. For this purpose, high level of FDI inflow is clearly desirable in Nigeria. Similarly, Portnoy (2012) is of the opinion that before any country takes the full advantage of what foreign direct investment has to offer, it must first improve on their economic environment by making it an enabling environment for investors. On that note, the environment in which these businesses function is influenced by several forces, one of such forces are the macroeconomic performance of the country. Therefore, the stability and instability of the indicators of macroeconomic performance reflects the economic situation of a country, and the level of business activities and growth determines the attractiveness of the inflow of foreign direct investments into the country (Agbonifob, 2005).

Glenn and Patrick (2008) conceptualized foreign direct investment to be the purchase or building by a domestic firm of a facility in a foreign country, of which involves a package of resources that

is made to complement the financial flows and make a distinctive contribution to the development process. Mankiw (2008) views foreign direct investment as a capital investment that is owned and operated by a foreign entity. In like manner, Blomqvist (2000) defines foreign direct investment as a situation where foreigners establish or expand firms that they control in another country. The World Bank (1996) equally views foreign direct investment to be an investment that is made to procure a lasting management interest (usually 10% of voting stock) in an enterprise and operating in a country other than that of investors.

Furthermore, Agbonifob (2005) expressed the enormous benefits of foreign direct investment to the economic prospect of Nigeria in numerous ways: first, foreign direct investment can greatly enhance the industrialization and development goals of Nigeria, by helping to finance investment. It is assumed by many economists that one of the objectives of industrialization is to provide employment for the inhabitants, and make goods available for consumers. Hence, if foreign direct investment is wooed into the country it will help provide employment, training and development of talents, technical or managerial skills to the citizens. It will also bring about development of technology. Moreover, it can also impact on the country's balance of payment by promoting export, also helping in integrating the country's economy into a global market. Foreign Direct Investment serves as an important engine for economic development which will result in the increase of the standard of living of the people, and much more. With so much benefit, one can only wish to have these foreign direct investments troop into the country for economic enhancement.

Akinboade (2006), highlighted that the level of consumer price index used as proxy for inflation determines the inflow of FDI into a country, thus, low inflation is taken to be a sign of internal economic stability in the host country. Any form of instability introduces a form of uncertainty that distorts investor perception of the future profitability in the country. Chingarande and Karambakuwa (2011) supported the statement that a stable economy attracts more FDI thus a low inflation environment is desired in countries that promote FDI as a source of capital flow, as such inflation is one of the indicators of macroeconomic performance which determines FDI inflow.

Few studies have been carried out based on the impact of macroeconomic performance on foreign direct investment, Bajo-Rubia and Sosvilla-Rivero, (1994) and Yang, *et al.* (2000) documented that inflation is one of the factors influencing foreign direct investment. Based on research, the steady increase of price level leads to the decrease in the value of domestic assets. Invariably, the increase in price level leads to the decrease in net investment profit, and assets values which decreases capital inflow into the country. Inflation results in the increase of investment risk, and the disturbance in information transferred through prices. Inflation hereby is a sign of instability and lack of macro policies control. Thus, inflation has an inverse relationship with the inflow of foreign direct investment.

Exchange rate is the value of the domestic currency relative to the foreign currency, it is viewed as a major indicator of macroeconomic performance. Oude (2013) enumerated that exchange rate fluctuations are mainly caused by changes in the demand and supply of the money in the FOREX market. When imports surpass the exports, the exchange rate will appreciate and rise in value. However if the exports exceeds the imports, then the exchange rate falls in value and depreciates. In the long-run, changes in the demand and supply of money depend on changes in the value of

goods imported and exported as well as long-term capital flows such as foreign direct investments (FDI). Thus, exchange rate is an important determinant oil international trade in consideration to export earnings generated

Exchange rate has been a contributing factor that determines foreign direct investment, it is on this jurisdiction that Masayuki and Ivohasina (2005) pointed out that if exchange rate depreciates, it will definitely attract foreign direct investment since foreign firms may merge with or acquire domestic industries. But, Harvey (1990) on the other hand, opined that exchange rate volatility in the long run has a negative effect which in comparison is far greater than the positive effects in attracting foreign direct investment, this is because greater exchange rate volatility of Dollar currency against Naira increases uncertainty over the return of a given investment in Nigeria. Potential investors will only invest in a foreign location only as long as the expected returns are high enough to cover the currency risk.

Soludo (1998) emphasized that, it is not the profitability of investment today that attracts investors to invest, but how long the profit will remain fairly stable overtime. In his opinion, whenever, the economic situation is volatile, the investors may decide to wait, in his idea, they may decide to invest in projects whose cycles are short. He also enumerated that while maintaining the macroeconomic stability, avoidance of over-valued exchange rates and export orientation are important for the renewal of investment.

Nigeria is a mono cultural economy which is heavily dependent on oil, these accounts for about 95 percent of its foreign exchange earnings, for that reason, the fall in oil price will bring forth unimaginable consequences in the economy. Vividly speaking, majority of the foreign direct investment are mostly in the oil sector, for instance Exxon Mobil, Chevron etc., it is on this platform that Chinwendu (2010) particularly commented that the fall in oil price may lead to stopping of exploration for discovery of new oil fields, he further stated that it is the price of crude that determines whether an oil firm will go and drill or not. Because of this, most foreign direct investment may be discouraged. Modjtahedi (2007) summarized that economic growth is the increase in real GDP in the long run-say over several decades and it is one of the indicator of macroeconomic performance in a country. The Performance of the host country in terms of its GDP is an important factor that boosts investor's confidence. Thus, in Nigeria many local companies are currently operating below capacity because of the decaying state of machines and equipment leading to lower productivity, this situation has a huge effect on FDI inflow as economic growth is a major factor that influences FDI inflow in a country. On the assertion of Akinlo (2004) the increase in economic growth has a positive relationship with FDI, since economic growth leads to greater market which in turn attracts FDI.

It is on this context that a clear understanding of the connection between the macroeconomic performance and foreign direct investment in Nigeria is to be examined as this study progresses. The macroeconomic performance to be considered in this study includes economic growth, exchange rate, consumer price index and oil price. Following the assertions, the relationship between macroeconomic factors and FDI could have a significant impact on the policy formulation and implementation targeting FDI inflow. It could also guide formation of economic policies on trade. This paper therefore aims at examining the factors that cause FDI while controlling for relevant variables using the autoregressive distributed lag (ARDL) bound test to cointegration

analysis. This enables us to propose some measures for FDI promotion in Nigeria and its peculiar characteristics.

The remainder of this study is structured as follows: Section 2 stylised facts on FDI end empirical studies of the factors determinants of FDI inflows, Section 3 presents the econometric model and data. The empirical results are presented in Section 4. Section 5 summarizes and concludes the paper with some policy recommendations for increased FDI inflows to Nigeria.

1.2 Stylized Facts on FDI

Foreign direct investment is without any doubt, vital to the economic growth of Nigeria. The Nigerian economy has been classified as one of the highest recipients of capital inflow in recent times but recent events in the country shows that such benefit might not be sustainable. For instance, Nigeria's share of Foreign Direct Investment (FDI) inflows to Africa fell from 35.3% in 1990 to 13.6% in 2000 then rose to 16.3% in 2005 and stood at 14.1% in 2010. Attempts have been made in the literature to unravel the cause of this volatile and unstable flow of FDI and the consequences of such volatility on overall economic progress in the country. Uncertainty may emanate from macroeconomic variables like exchange rates, inflation rates, interest rate, decline in economic growth and many more. According to Senbet (1996), in Africa, macroeconomic variables play a significant role in hampering capital flows along with the economic and political instability.

Recent studies reveal that foreign investors are attracted to a country where there is macroeconomic stability and low investment risk in terms of steady price, high economic growth, less volatile exchange rate, increase in GDP and much more. But when we take a closer look at the situation in Nigeria, we find out that there is a high level of macroeconomic disequilibrium emanating from various disturbances on these macroeconomic variables. Let's take for instance the issue of dwindling oil price which occurred as a result of the collapse in the global oil price per barrel, this situation has reduced our foreign reserve as well as the GDP growth rate in the country. Nevertheless, the recent increase in the inflationary rate as a result of scarcity in petroleum product is not helping matters as this has caused an increase in the prices of goods and services leading to investment risk. Our currency (Naira) is depreciating day after day owing to the fact that only just a few country are demanding for our products. Economic growth is not left out as lower investment leads to lower GDP. This situation has weakened the economy against its global competitors driving away potential investors. Which shows that even though we are one of the top recipient for FDI destination as attested by UNCTAD, (2014) it is much less compare to the number of foreign direct investment we are supposed to get with a country blessed with so much natural resources.

Added to the above problem is the inability to retain the foreign direct investment which has already come into the country and understanding the factors driving FDI inflows into a country and their impact on a country's economic development. The analysis here reveals that a country like Nigeria needs stable macroeconomic performance to take full advantage of what FDI has to offer and attract more FDI. In addition, there is insufficient research undertaken on this research topic, where, numerous studies have analyzed the impact of foreign direct investment on economic growth in Nigeria. Some other works are on the magnitude of direction and prospects of foreign direct investment. But just few researches have been conducted on the impact of macroeconomic

performance on foreign direct investment in Nigeria. This gap needs to be filled, as no finding has come to a verdict on how these variables determines the inflow of foreign direct investment in Nigeria.

2.1 Empirical Review

This framework attempts an apt overview of previous empirical studies on FDI inflows. Empirically, there is a lot of literature on the effects of FDI on Economic growth in Nigeria, but just a few amount of literature exists on the impact of macroeconomic performance on FDI inflow in Nigeria. On that note, Malik and Malik (2013) analyzed and evaluated the impact of core macroeconomic variables QDP, Inflation and Exchange Rate on FDI inflow in Pakistan. A time series data covering four decades from year 1971 ' to year 2009, as well as OLS technique was adopted for the analysis, . The results showed that all three macroeconomic variables are positively associated to the dependent variable - FDI. The results show that GDP, inflation and exchange rate have positive impact on FDI inflows.

Nazir and Sarwar (2012) in their paper examined the impact of capital inflows on domestic inflation in the context of Pakistan. The study covered the period 1980 to 2010, the variables incorporated are exports, FDI, Remittances and inflation rate. The paper applied unit root test for stationary, cointegration test and VECM were used to check for the long-run and short run relationship among the variables. The results show that there prevails long run and significant relationship. The error correction term for INF growth bears the correct sign i.e. it is negative and statistically significant. A number of empirical research works confirm the strong impacts of exchange rate on FDI. Froot and Stein (1991) investigated the impact of real exchange rates on FDI from industrialized countries to the United States by, using annual data covering 1974-87 periods. Breaking total FDI inflows to thirteen separate industries, they found that all of the thirteen coefficients on the exchange rate present negative signs, five of which were statistically significant.

In other words, Razmi and Behname (2012) made an experiment on FDI determinants and oil effects on foreign direct investment from Islamic countries using cointegration analysis as well times series data from 1981- 2010. Based on their results GDP had a positive and significant effect on FDI attraction; this means that a high market size is important for investors because they can sell their outputs very easily, and since a high GDP shows a high purchasing power, increase in GDP leads to high inflow of FDI. Also, he considered four exporting oil countries (Iran, Qatar, Saudi Arabia and Kuwait) to evaluate the effect of oil extraction on FDI attraction. Their result shows that oil extraction has a negative and significant impact on FDI. This is because investors estimate that in the host countries there is a dependency between government income and oil sale. This dependency shows that with a sudden change in oil price, economic risk in these countries will increase. Economic crisis in the years 1997, 1998 and 1999 in Asian countries had a negative effect on FDI.

Okafor (2012) analyzed on the impact of pull factors on capital movement in Nigeria. The empirical analysis addresses the role of key domestic macroeconomic variables on FDI in Nigeria using the OLS estimation technique. The result shows that real GDP, interest rate, and real exchange rate are key determinants of FDI in Nigeria. Osinubi and Amaghionyeodiwe (2009) conducted a study on the impact of exchange rate volatility on foreign direct investment in Nigeria for the period 1970 to 2004. Using Ordinary Least Squares (OLS) and the error correction model

ECM estimation techniques, the findings revealed a significant positive relationship between real inward FDI and exchange rate. The study also suggested that exchange rate volatility need not be a source of worry for foreign direct investors in Nigeria.

In furtherance, Oladipo (2013) carried a study on the macroeconomic determinants of FDI in Nigeria. It, specifically, examines a few selected macroeconomic variables that have either direct or indirect relationship with FDI in Nigeria. Also, a trend analysis was performed to throw light on the flow of FDI. The author used annual time series data for the period of 1985 to 2010 on macroeconomic variables such as FDI, Money Supply (MS), GDP, Inflation (INF), Trade Openness (OP), Government Capital Expenditure (GCE), Government Recurrent Expenditure (GRE), Poverty Level (POV) Exchange Rate (EXR) and Interest Rate (INR). The results show that only EXR, INR, MS and OP determines FDI in Nigeria. Udoh and Egwaikhide, (2008) studied the impact of exchange rate volatility and inflation uncertainty on foreign direct investment in Nigeria for the period 1970-2005. Based on their study these two variables were estimated using GARCH model and the result showed that exchange rate volatility and inflation uncertainty exerted a significant influence on foreign direct investment.

Consequently, Anyanwu (1998) experiment on the economic determinant of foreign direct investment in Nigeria and it showed the positive role of domestic market size in determining foreign direct investment inflows into the country. This study noted that the abrogation of the indigenization policy in 1995 significantly encouraged the flow of foreign direct investment into the country and that more effort is required in raising the nation's economic growth so as to attract more foreign direct investment. Ogunleye (2008) examined the relationship between exchange rate volatility and foreign direct investment in Nigeria and South Africa. The study observed that exchange rate volatility negatively influenced foreign direct investment inflows while FDI inflows aggravated exchange rate volatility in both countries, which corresponds with the finding carried out by Osinubi and Amaghionyeodiwe (2009).

Asiedu (2002), Behnane (2011, 2011) and Charkrabarti (2001) conducted survey on inflation, they discovered that 'inflation reveals economic risk, in line to their observation, the countries that had a high level of inflation showed a high level of economic risk then investors showed a negative reflex to investment in such countries. Onuorah and Chi-Chi (2013) designed to investigate the long run relationship between macroeconomic variables and FDI in Nigeria. The result showed evidence of negatively strong relationship between FDI and GDP in the country suggesting inverse relationship. EX, IF, MSP and IR exact direct impact on FDI.

3.0 Data and Methodology

3.1. Definition of Variables and Data Description

This study uses annual data covering the period of 1981 to 2015. Four macroeconomic variables are employed: oil prices, real GDP per capita, exchange rate, inflation rate. All data are sourced from central bank of Nigeria and World Bank development indicators. Oil price and real GDP per capita are included in the study to control for the possible influence of other components of Nigeria macro-economy. These factor have been identify among the most significant determinants of FDI.

Table 1 provides additional information on all the variables.

Table 1: Data Description

Variables	Year	Explanation	Source	Type of Data	Expected Sign
Foreign direct Investment (FDI)	1981-2015	Foreign direct investment (FDI) is an investment involving acquiring or creation of assets that is undertaken by foreigners or a joint venture with local governments with the main aim of creating a long-term relationship.	World Development Indicators (World bank)	FDI, net inflows (BOP, current US\$).	
Real Gross domestic product (RGDPC)	1981-2015	Real gross domestic product (GDP) is an inflation-adjusted measure that reflects the value of all goods and services produced by an economy in a given year, expressed in base-year prices, and is often referred to as "constant-price," "inflation-corrected". It is a proxy for economic growth.	World Bank Development Indicators (World Bank)	GDP at constant 2005, in local currency (LCU).	+
Inflation (INFLA)	1981-2015	Frequent fluctuations in the level of prices reflects instable macroeconomic environment in a country	World Bank Development Indicators (World Bank)	Consumer price index 2010=100	-
Official Exchange rate (EXTR)	1981-2015	Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (local currency units relative to the U.S. dollar)	World Bank Development Indicators	Official exchange rate (LCU per US\$, period average)	+ or -
Oil price (OILP)	1981-2014	Oil price is the price for which crude oil per barrel is bought or purchased, it is the global oil price.	British Petroleum.	Brent oil price at \$.	-

Source: Author's Computation

3.2 Model Specification

Following the empirical literature in FDI, it is plausible to form the long-run relationship between FDI, INFLA, OILP, EXTR and RGDPC in linear form, with a view of testing the long-run and short-run between these variables in Nigeria as follows:

$$FDI = f(INFL, OILP, RGDPC, EXTR) \quad (1)$$

The above model can be re-written in logarithmic form as follows:

$$LFDI_t = \alpha + \beta_1 LINFL_t + \beta_2 LOILP_t + \beta_3 LRGDPC_t + \beta_4 LEXT_t + \varepsilon_t \quad (2)$$

$\ln fdi_t$ is the natural log of foreign direct investment, $\ln pcrd_t$ is the natural log of credit to private sector, $\ln infl_t$ is the natural log inflation, $\ln rgdp_t$ is the natural log of real gross domestic product, $\ln oilp_t$ is natural log oil prices, $\ln extr_t$ is the natural log of exchange rate α is the intercept, β_1 to β_4 are the elasticities with respect to change to foreign direct investment.

3.3 Methodology

3.3.1 Unit Root Test

In time series analysis, before running the cointegration test the variables must be tested for stationarity. For this purpose, we use the conventional ADF tests, the Phillips–Perron test following Phillips and Perron (1988). The ARDL bounds test is based on the assumption that the variables are I(0) or I(1). Therefore, before applying this test, we determine the order of integration of all variables using unit root tests by testing for null hypothesis $H_0: \beta = 0$ (i.e β has a unit root), and the alternative hypothesis is $H_1: \beta < 0$. The objective is all variables should not be I(2) so as to avoid spurious results. In the presence of variables integrated of order two we cannot interpret the values of F statistics provided by Pesaran, *et al.* (2001) or it will go boasted.

3.3.2 Cointegration Approach

In order to empirically analyse the long-run relationships and short-run relationship between *FDI*, *EXTR*, *rgdpc*, *INFL* this study apply the autoregressive distributed lag (ARDL) cointegration technique as a general vector autoregressive (VAR). The ARDL cointegration approach was developed by Pesaran and Shin (1999) and Pesaran, *et al.* (2001). This approach enjoys several advantages over the traditional cointegration technique documented by (Johansen and Juselius, 1990). Firstly, it requires small sample size. Two set of critical values are provided, low and upper value bounds for all classification of explanatory variables into pure I(1), purely I(0) or mutually cointegrated. Indeed, these critical values are generated for various sample sizes. However, Narayan (2005) argues that existing critical values of large sample sizes cannot be employed for small sample sizes. Secondly, Johansen’s procedure require that the variables should be integrated of the same order, whereas ARDL approach does not require variable to be of the same order. Thirdly, ARDL approach provides unbiased long-run estimates with valid t-statistics if some of the model explanatory variables are endogenous (Narayan 2005 and Odhiambo, 2008). Fourthly, this approach provides a method of assessing the short run and long run effects of one variables on the other and as well separate both once an appropriate choice of the order of the ARDL model is made, (see Bentzen and Engsted, 2001). In this regard, Pesaran and Shin (1999) explained that AIC and SC perform well in small sample, but SC is relatively superior to AIC. The ARDL model is written as follow;

$$\begin{aligned} \Delta LFDI_t = & \alpha_0 + \sum_{i=1}^n \beta_{1i} \Delta LFDI_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta LEXTR_{1t-i} + \sum_{i=0}^n \beta_{3i} \Delta LRGDP_{2t-i} + \\ & + \sum_{i=0}^n \beta_{4i} \Delta LOILP_{4t-i} + \sum_{i=0}^n \beta_{5i} \Delta LINFL_{4t-1} + \beta_{6i} \ln fdi_{t-i} \\ & + \beta_7 LEXTR_{t-1} + \beta_8 LRGDP_{t-1} + \beta_9 LOILP_{t-1} + \beta_{10} LINDL_{t-1} + \varepsilon_t \end{aligned} \quad (3)$$

Where Δ is the difference operator while ε_t is white noise or error term. The bounds test is mainly based on the joint F-statistic whose asymptotic distribution is non-standard under the null hypothesis of no cointegration. The first step in the ARDL bounds approach is to estimate the four equations (2) by ordinary least squares (OLS). The estimation of the three equations tests for the existence of a long-run relationship among the variables by conducting an F-test for the joint significance of the coefficients of the lagged levels of the variables. The null hypothesis of no cointegration and the alternative hypothesis which are presented in (Table 2) below as thus:

Table 2: Statement of Hypothesis

null hypothesis of no co-integration	alternative hypothesis	Eq
$H_0: \beta_6 = \beta_7 = \beta_8 = \beta_9 = \beta_{10} = \beta_{13} = 0$	$H_1: \beta_6 \neq \beta_7 \neq \beta_8 \neq \beta_9 \neq \beta_{10} \neq 0$	2

Source: Author’s Design

According to Narayan (2005), two sets of critical values for a given significance level can be determined. The first level is calculated on the assumption that all variables included in the ARDL model are integrated of order zero, while the second one is calculated on the assumption that the variables are integrated of order one. The null hypothesis of no cointegration is rejected when the value of the test statistic exceeds the upper critical bounds value, while it is not rejected if the F-statistic is lower than the lower bounds value. Otherwise, the cointegration test is inconclusive. Following Odhiambo (2009) and Narayan and Smyth (2008), we obtain the short-run dynamic parameters by estimating an error correction model associated with the long-run estimates. The equation, where the null hypothesis of no cointegration is rejected, is estimated with an error-correction term (see Narayan and Smyth, 2006; Morley, 2006). The vector error correction model is specified as follows:

$$\Delta \ln fdi_t = \alpha_0 + \sum_{i=1}^n \beta_{1i} \Delta \ln fdi_{t-i} + \sum_{i=0}^n \beta_{2i} \Delta \ln infla_{1t-i} + \sum_{i=0}^n \beta_{3i} \Delta \ln oilp_{2t-i} + \sum_{i=0}^n \beta_{4i} \Delta \ln pcrd_{3t-i} + \sum_{i=0}^n \beta_{5i} \Delta \ln rgdpc_{4t-i} + \lambda_1 ECM_{t-i} + \mu_{1t} \quad (4)$$

ECM_{t-1} is the error correction term obtained from the cointegration model. The error coefficients (λ_1) indicate the rate at which the cointegration model corrects its previous period’s disequilibrium or speed of adjustment to restore the long run equilibrium relationship. A negative and significant ECM_{t-1} coefficient implies that any short run movement between the dependant and explanatory variables will converge back to the long run relationship.

3.3.3 Stability and Diagnostic Test

To ensure the goodness of fit of the model, diagnostic and stability tests are conducted. Diagnostic tests examine the model for serial correlation, functional form, non-normality and heteroscedasticity. The stability test is conducted by employing the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares of recursive residuals (CUSUMSQ) suggested by Brown, *et al.* (1975). The CUSUM and CUSUMSQ statistics are updated recursively and plotted against the break points. If the plots of the CUSUM and CUSUMSQ statistics stay within the critical bonds of a 5 percent level of significance, the null hypothesis of all coefficients in the given regression is stable and cannot be rejected.

4.0. Empirical Results

4.1 Unit Root Tests

The results of the ADF (Augmented Dickey Fuller) and the PP (Phillips Perron) unit root tests in Table 2 show that the order of integration of the variables is mixed [I(0) and I(1)]. However none of the variables is integrated of order two I(2). The integration of the variables at I(0) and I(1) makes ARDL the preferred approach in this empirical analysis. The results of unit root with unknown single structural break presented in Table 3 dates indicate the presence of a structural break in all the data series. Interestingly, the stationary properties confirm that none of the variables is stationary at second difference [I(2)].

Table 3: ADF and PP Unit Root Tests

	ADF		PP		Decision	ADF		PP		Decision
	Level					First Difference				
FDI	-2.5958	0.1036	-2.4756	0.1301	I(0)	-9.8019	0	-9.8693	0	I(1)
EXTR	-2.0160	0.2789	-2.1770	0.2179	I(0)	-4.9548	0.0003	-4.9548	0.0003	I(1)
RGDP	0.47207	0.9832	0.20354	0.9689	I(0)	-4.3450	0.0016	-4.3308	0.0017	I(1)
OILP	-1.0274	0.7322	-1.0247	0.7332	I(0)	-5.3201	0.0001	-5.3157	0.0001	I(1)
INFL	-2.5958	0.1036	-2.4756	0.1301	I(0)	-9.8019	0	-9.8693	0	I(1)

Note: All variables are in the natural log form

Source: E-view9

The results for the unit root test are reported in table 3. All that data are transformed into the natural log form. To determine the order of integration of the variables, the ADF (augmented Dickey-Fuller) test complemented with the PP (Philips-Perron) test in which the null hypothesis is $H_0 = \beta = 0$ (i.e. β has a unit root) and the alternative hypothesis is $H_1: \beta < 0$ are implemented. The result for both the level and differenced variables are presented in table 3. The stationarity tests were performed first in levels and then in first difference to establish the presence of unit roots and the order of integration in all the variables. The results of the ADF and PP stationarity tests for each variable show that both tests fail to reject the presence of unit root for the data series in level, indicating that these variables are non-stationary at levels. The first difference results show that these variables are stationary at 1% significance level (integrated of order one I(1)).

4.2 Results of ARDL Co-integration Test

Since ARDL bounds test is known to be sensitive to lag length, this study examines the VAR Lag Order Selection. Table 4 suggests the specification of a maximum lag length of one (Max lag = 1) in the ARDL bound test using Akaike information Criteria (AIC). Given the sample size of 35 observations (1981-2015) used in this study, the critical values for the evaluation of the null hypothesis are taken from Narayan (2005). The results of the co-integration test based on the ARDL-bounds testing method for one specifications of the log-linear empirical model in Eq. (2) are presented in Table 5. The results indicate that the F-statistic is greater than the upper critical bound from Narayan (2005) at 5% significance level using restricted intercept and no trend. This study therefore rejects the null hypothesis of no cointegration among the variables. This shows that there is a long-run causal relationship among the variables in Nigerian economy.

Table 4: VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-177.3795	NA	0.061387	11.39872	11.62774	11.47463
1	-64.98309	182.6442*	0.00026*	5.93644*	7.31057*	6.39192*
2	-43.01254	28.83634	0.000364	6.125784	8.645017	6.960839
3	-26.02641	16.98613	0.000851	6.62665	10.29099	7.841275

* indicates lag order selected by the criterion; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion

Source: eview9

Table 5: ARDL Bounds Cointegration Test Results

Selected Model: ARDL(1, 0, 0, 0, 1)

Test Statistic	Value	K
F-statistic	3.632942*	4
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.50%	3.25	4.49
1%	3.74	5.06

ARDL Models selected on Akaike info criterion (AIC)

* indicate significance at 10% level respectively.

Source: E-view9

4.3 Long Run and Short Run Estimates

The estimated long-run and short-run coefficients are presented in Table 6 and 7. The long-run coefficient of exchange rate is positive and statistically significant at 1% level and it is in position with a priori. This indicates that a unit increase in exchange rate will likely lead to 0.245% increase foreign direct investment in Nigeria. This is because it will cheaper to invest in Nigerian economy. Per capital income (RGDP) indicates negative and statistically significant at 5% level and in line relevant economic and empirical finding-market size hypothesis. It means that a unit decrease in real GDP will lead to 0.2975% decrease in FDI. Oil price is negative and statistically significant at 10% level. With a coefficient of -0.3409, a unit increase in oil price will lead to 0.3409% decrease in foreign direct investment to increase in long run. Inflation rate shows positive and statistically significant at 1% level. With a coefficient of 0.4785, a 1% increase in inflation will cause the foreign direct investment to increase by 0.4785 in the long run. This means that the rising of inflation affects foreign direct investment positive. This result is consistent with the findings of Saymeh and Orabi (2013) for Jordan and Rogoff and Reinhart (2002) for Africa. This is contrary to the past findings and documented theories that inflation has inverse relationship with FDI (see Schneider and Frey, 1985; Trevino and Mixon, 2004, Agbloyor, *et al.*, 2013).

On the side of short run estimates in table 7, the coefficient of ECM (-1) is negative and significant at 1% level. It means, about 0.2855% of the short-run disequilibrium is corrected in the long-run. The short-run coefficient of exchange rate is positive and statistically significant at 1% level and it is in position with a priori. This indicates that a unit increase in exchange rate will likely lead to 0.2855% increase foreign direct investment in Nigeria. This is because it will cheaper to invest in Nigerian economy. Per capital income (RGDP) indicates negative and statistically significant at

5% level. It means that a unit decrease in real GDP will lead to 0.264% decrease in FDI. Oil price shows negative and statistically significant at 10% level. With a coefficient of -0.3030, a unit increase in oil price will lead to 0.3030% decrease in the foreign direct investment to increase in long run. However, inflation rate shows positive and statistically insignificant at 10% level.

Table 6: Long Run Estimates

Long Run Coefficients				
Variable	Coefficient	Std. Err	t-Stat	Prob.
LEXTR	0.2450***	0.063193	3.877311	0.0006
LRGDP	-0.2975**	0.126033	-2.36125	0.0257
LOILP	-0.3409*	0.18247	-1.86838	0.0726
LINFL	0.4785***	0.16419	2.914866	0.0071
C	1.9555*	1.084913	1.802502	0.0826

Note: *, **, and *** indicate significance at 10%, 5% and 1%, respectively

Table 7: Short Run Estimates

Variable	Coefficient	Std. Err	t-Stat	Prob.
D(LEXTR)	0.2177***	0.078348	2.779672	0.0098
D(LRGDP)	-0.264**	0.123507	-2.14166	0.0414
D(LOILP)	-0.3030**	0.175388	-1.72773	0.0955
D(LINFL)	0.20855	0.139934	1.490353	0.1477
CointEq(-1)	-0.888***	0.192721	-4.61202	0.0001
Diagnostic Test				
R-squared	0.618407			
Adjusted R-squared	0.533609			
Durbin-Watson stat	2.119591			
Het Test: Breusch-Pagan-Godfrey	7.131995			0.3088
Breusch-Godfrey Serial Correlation LM Test:	4.415748			0.1099
Ramsey RESET Test	0.05195			0.8215

Note: *, **, and *** indicate significance at 10%, 5% and 1%, respectively

3.3 Diagnostic and Stability Tests

The diagnostic test results in Table 7 show that there are no evidence of serial correlation, heteroscedasticity and functional form misspecification in the two ARDL models estimated. Figure 1 shows the cumulative sum of recursive residuals (CUSUM) and the cumulative sum of squares (CUSUMSQ) stability test results. The figures suggest that the coefficients of the estimated ARDL model are stable.

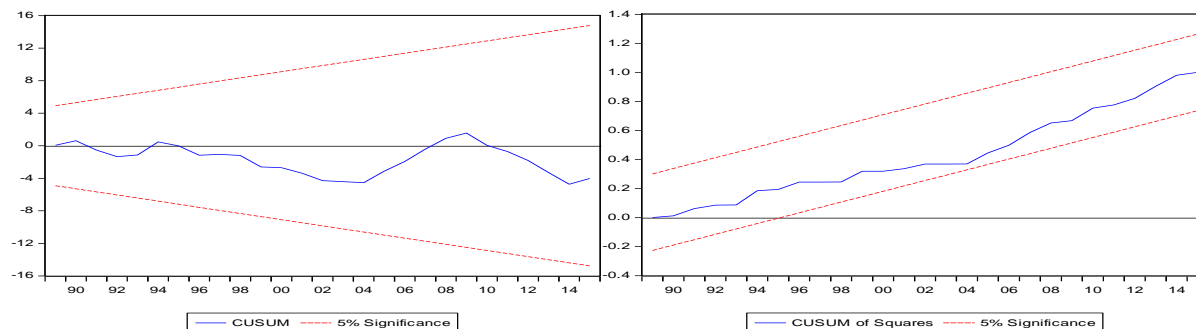


Figure 1: CUSUM and CUSUM of Squares for the model

5.0 Conclusion and Policy Implications

This study examines the determinants of FDI in Nigeria over the period of 1981 to 2015 using the ARDL approach to cointegration analysis. Four macroeconomic variables are employed: oil prices, real Gdp per capita, exchange rate, inflation rate over the study period. The results suggest that the long and short run effects of the selected macroeconomic variables in determining the FDI inflow in Nigeria over the period. First, in the long run exchange rate and inflation rate are found to be positive and statistically significant on FDI. This supports the results from Oladipo (2013), Onuorah and Chi-Chi (2013), Asiedu (2002) and Osinubi and Amaghionyeodiwe (2009) in highlighting the significant influence of the selected variables. Furthermore, the negative and significant position of market size (RGDP) and oil price are found to coexist in the short and long interaction of FDI and some of the selected variables. This could be as a result of investors' perception that that in the host countries there is a dependency between government income and oil sales. Contrary to the findings from Razmi and Behname (2012) that GDP has positive and significant effect on FDI attraction for Iran, Qatar, Saudi and Kuwait while oil extraction has a negative and significant impact on FDI. In sum, all other variables are found to be statistically significant in attracting FDI in Nigeria both at the short and long run. See related studies (Malik and Malik, 2013; Nazir and Sarwar, 2012; Froot and Stein, 1991).

However, this study has some policy implications. Policies aimed at improving stock improving the level of infrastructure on the continent, opening up and liberalizing trade, strengthening institutions and reducing macroeconomic instability will be beneficial for FDI flows to the continent. Finally, policies aimed at attracting FDI are necessary because higher FDI flows can cause more banking and financial development. Also government should strengthened the political institutions and adopt democratic principles that will ensure stability within the polity. Fourthly, government should allow the exchange rate to depreciate further since it will reduce the dollar price of some ailing indigenous industries, thereby attracting more foreign investment in the form acquisition or mergers.

References

- Aliber, R.Z. (1970). *A theory of foreign direct investment*. In Kindleberger, C.P. (Ed.), *The international corporation*. Cambridge, MA: MIT Press.
- Anyanwu, J.C. (1998). An econometric investigation of the determinants of foreign direct investment in Nigeria. *Annual Conference, Nigeria Economic Society*.
- Aremu, J.A. (1997). Foreign Private Investment: Issues, Determinants and Performance. *Paper Presented at a Workshop on Foreign Investment Policy and Practice, Nigeria Institute of Advanced Legal Studies, Lagos*.
- Asiedu, E. (2004). Capital controls and foreign direct investment. *World Development*, 32 (3), 479–90.
- Asiedu, E. (2006). Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability. *World Economy*, 29, 63–77.
- Asiedu, E. (2002). On determinants of foreign direct investment in developing countries. Is Africa different? *Development Economics*, 30(1), 107-119
- Baniak, A., Cukrowski, A. J. and Herczynski, J. (2005). On the determinants of foreign direct investment in transition economies. *Problems of Economic Transition*, 48(2) 6–28.
- Bekhet, H.A. and Al-Smadi, R.W. (2012). Exploring the relationship among FDI determinates: Evidence from Jordan. *Conference on Asian Forum on Business Education (AFBE), UNITEN, Selangor, Malaysia, July, 9*.
- Bekhet, H.A. and Mugableh, M.I. (2013). Examining the equilibrium relationships between foreign direct investment inflows and employment in manufacturing and services sectors: evidence from Malaysia. *J. Soc. Dev. Sci.*, 4(1), 32–38.
- Bentzen, J. and Engsted, T. (2001). A revival of the ARDL model in estimating energy demand relationship (Cointegration: Bounds Testing Approach). *Energy Finance*, 26, 45-55.
- Bloningen, B. A. (2005). A review of the empirical literature on FDI determinants. *NBER Working Papers No. 11299*. Cambridge, MA.
- Bornschiefer, V., Chase-Dunn, C., and Rubinson, R. (1978). Cross-national evidence of the effects of foreign investment and aid on economic growth and inequality: A survey of findings and reanalysis. *American Journal of Sociology*, 84, 651–683.
- Brown, R. L., Durbin, J. and Ewans, J.M. (1975). Techniques for testing the constance of regression relations overtime. *J. R. Stat. Soc.* 37, 149–172.
- Buckley, P. J. and Casson, M. (1991). *The future of multinational enterprise*, MacMillan, London
- Central Bank of Nigeria (CBN) Annual Bulletin various issues (1981-2014).
- Chandran, V.G. and Krishnan, G. (2008). Foreign direct investment and manufacturing growth: the Malaysian experience. *Int. Bus. Res.* 1 (3), 83–90.

- Cleeve, E. (2008). How effective are fiscal incentives to attract FDI to Sub-Saharan Africa?, *The Journal of Developing Areas*, 42(1) 135–53.
- Dickey, D. A. and Fuller, W. A. (1979). Distribution of the estimators for autoregressive time series with a unit root, *Journal of the American Statistical Association*, 74, 427–31.
- Dunning, J. H. (1993) *Multinational Enterprises and the Global Economy*, Addison-Wesley, Reading, MA.
- Edwards, S. (1990). Capital flows, foreign direct investment, and debt-equity swaps in developing countries. *NBER Working Paper*, 3497.
- Ekpo, A.H. (1997). Determinants of foreign direct investment in Nigeria: Evidence from time series data. *CBN Economic and Financial Review*, 35(1) 59-78.
- Engle, R. F. and Granger, C. W. J. (1987). Cointegration and error correction: Represent estimation, and testing. *Econometrica*, 55, 251–76.
- Faras, R.Y. and Ghali, K. H.(2009). Foreign direct investment and economic growth: the case of the GCC countries. *Int. Res. J. Financ. Econ.* 29, 135–145.
- Fernandez-Arias, E. (1996), The new wave of capital inflows: Push or pull?, *Journal of Development Economics*, 48, 389–418.
- Fernandez-Arias, E. and Montiel, P. J. (1996). The surge in capital inflows to developing countries: An analytical overview. *The World Bank Economic Review*, 10(1) 51–77.
- Frey, B. (1984). *International political economics*. Basil Blackwell, 76–81.
- Froot, K. A. and Stein, J. C. (1991). Exchange rates and foreign direct investment and imperfect capital market approach. *Quarterly Journal of Economics*, 1191–217.
- Goldberg, L. S. and Klein, M. W. (1998). Foreign direct investment, trade and real exchange rate linkages in Southeast Asia and Latin America. *Cambridge University Press*.
- Grosse, R., and Trevino, L. J. (1996). Foreign direct investment in the United States: An analysis by country of origin. *Journal of International Business Studies*, 27(1).
- Harms, P. and Lutz, M. (2006). Aid, governance, and private foreign investment. *Economic Journal*, 116, 513,
- Hosein, E., Noorbakhsh, F., Paloni, A. and Azemar, C. (2009). The causal relationships between foreign direct investment (FDI), domestic investment (DI) and economic growth (GDP) in North African non-oil producing countries: Empirical evidence from cointegration analysis. *Advances In Management*, 2(11), 19–25.
- Hsiao, F. and Hsiao, M. (2006). FDI, exports, and GDP in east and Southeast Asia panel data versus time-series causality analyses. *J. Asian Econ.* 17, 1082–1106.
- Iamsiraroj, S. (2015). The foreign direct investment-economic growth nexus. *International Review of Economics and Finance*, 42, 116-133.

- Imoudu, E. C.(2012). The impact of foreign direct investment on Nigeria's economic growth; 1980–2009: Evidence from the Johansen's co-integration approach. *Int. J. Bus. Soc. Sci.* 3(6), 122–134.
- Johansen, S.and Juselius, K. (1990). Maximum likelihood estimation and inference on cointegration with applications to the demand for money. *Oxford Bulletin of Economics and Statistics*, 52, 169–210.
- Karakaplan, U. M., Neyapti, B. and Sayek, S. (2005). Aid and foreign direct investment: international evidence.*Bilkent University Discussion Paper*, 05-05.
- Kindleberger, C. P. (1969).*American business abroad*, Yale University Press, New Haven
- Kumar, N. and Pradhan, J.P. (2002). Foreign direct investment, externalities and economic growth in developing countries: Some empirical explorations and implications for WTO negotiations on investment. Research and information system for the non-aligned and other developing countries.
- Lall, P., Norman, D. W. and Featherstone, A. M. (2003). Determinants of US direct foreign investment in the Caribbean.*Applied Economics*, 35(13), 1485–96.
- Loree, D. W. and Guisinger S. E. (1995). Policy and non-policy determinants of U.S. equity foreign direct investment.*Journal of International Business Studies*, 26(2), 281-99.
- Lv, L.,Wen, S.,and Xiong, Q.(2010). Determinants and performance index of foreign direct investment in China's agriculture. *China Agric. Econ. Rev.* 2 (1), 36–48.
- Markusen, J. R., and Maskus, K. E. (2002). Discriminating among alternative theories of the multinational enterprise. *Review of International Economics*, 10(4), 694-707.
- Marr, A. (1997). Foreign direct investment flows to low-income countries: A review of the evidence. *Briefing paper, OverseasDevelopment Institute*.
- Moore, M. O. (1993). Determinants of German manufacturing direct investment: 1980–1988. *Weltwirtschaftliches Archiv*, 129, 120–137.
- Narayan, P.K. and Smyth, R. (2008). Energy consumption and real GDP in G7 countries: New evidence from panel cointegration with structural breaks. *Energy Economics*,30, 2331–2341.
- Narayan, P. K. and Smyth, R.(2006). Higher education, real income and real investment in China: Evidence from Granger causality tests. *Education Economics*, 14, 107–125.
- Narayan, P. K. (2005). The saving and investment nexus for China: Evidence from cointegration tests.*Applied Economics*, 37:17, 1979-1990
- Obadan, M. I. (1982). Direct Investment in Nigeria: An empirical analysis.*African Studies Review*, 25(1).

- Odhiambo, N.M.(2009). Energy consumption and economic growth in Tanzania: An ARDL bounds testing approach. *Energy Policy*,37 (2) 617–622
- Okere, K. and Iheanacho, E. (2016). The impact of trade protectionist policy on the economic growth of Nigeria, *International Journal of Finance and Accounting*.5 (4)171-183.
- Olatunji, D. (2001). At home abroad when titles get in the way. *The Nation Newspapers*, Tuesday, September, 25.
- Onyeiwu, S. and Shrestha, H. (2004). Determinants of foreign direct investment in Africa. *Journal of Developing Societies*,20, 89–106.
- Othman, R., Salleh, N. and Sarmidi, T.(2012). Analysis causal relationship between development, economic growth and foreign direct investment: An ARDL Approach. *J. Appl. Sci.* 12 (12), 1245–1254.
- Pal, K. and Mittal, R.(2011). Impact of macroeconomic indicators on Indian capital markets. *J. Risk Financ.* 12 (2), 84–97.
- Pesaran, M. and Pesaran, B. (1997). *Working with Microfit 4.0: Interactive Economic Analysis*, Oxford University Press, Oxford
- Pesaran, M. H. and Shin, Y. (1995). Autoregressive distributed lag modelling approach to cointegration analysis. *DAE WP 9514*. Department of Applied Economics, University of Cambridge.
- Pfefferman, G.P. and Madarassy, A. (1992). Trends in private investment in developing countries. International Finance Corporation. *Discussion Paper No. 14, Washington, DC*.
- Pradhan, R., Saha, D. and Gupta, V. (2011). Determinants of FDI in SAARC countries: an investigation using panel VAR model. *Inf. Manag.Bus. Rev.* 3 (2), 117–126.
- Raff, H. (2004). Preferential trade agreements and tax competition for foreign direct investment. *Journal of Public Economics*, 55(12), 2745-2763.
- Samimi, A.J., Rezanejad, Z. and Ariani, F.(2010). Growth and FDI in OIC countries. *Aust. J. Basic Appl. Sci.* 4 (10), 4883–4885.
- Scaperlanda, A. and Balough, R. (1983). Determinants of US direct investment in the EEC revisited. *European Economic Review*,21(3), 381–390.
- Scaperlanda, A. and Mauer, L.J. (1973). The impact of controls on US direct foreign investment in the EEC. *Southern Economic Journal*, 39(3), 419–423.
- Schneider, F. and Frey, B. (1985), Economic and political determinants of foreign direct investment. *World Development*,13, 161–75.
- Sun, H. (2011). Co-integration study of relationship between foreign direct investment and economic growth. *Int. Bus. Res.* 4 (4), 226–230.

- Trevino, L. J., and Mixon, F. G., Jr. (2004). Strategic factors affecting foreign direct investment decisions by multi-national enterprises in Latin America. *Journal of World Business*, 39.
- Trevino, L. J., Daniels, J. D., Arbelaez, H. and Upadhyaya, K. P. (2002). Market reform and foreign direct investment in Latin America: Evidence from an error correction model. *International Trade Journal*, 16(4), 367-392.
- Tsai, P. (1994). Determinants of foreign direct investment and its impact on economic growth. *Journal of Economic Development*, 19, 137–63.
- Tsoukalas, D. (2003). Macroeconomic factors and stock prices in the emerging Cypriot equity market. *Manag. Finance* 29(4), 87–92.
- Weis, J. (2000). Local corruption and global capital flows. *Brookings Paper. Econ. Act.* 0(2), 303–46.
- Wheeler, D. and Mody, A. (1992). International investment location decision: The case of United-States Firms. *Journal of International Economics*, 33, (1–2)57–76.
- World Bank Development Indicator-online