International Journal of Research
Available at https://pen2print.org/index.php/ijr/
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

# Foreign Direct Investment and Economic Growth in Nigeria: Sectors Specific Analysis (1970 – 2016)

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**Abstract**

*This study examined the effect of Foreign Direct Investments flow to agriculture, manufacturing and processing, and mining and quarrying subsectors of the Nigerian economy on Economic Growth (GDP). Conceptual as well as empirical literature were reviewed and evaluated. The relevant data were extracted from the annual statistical bulletin of the central Bank of Nigeria. A unit root test was carried out using Augmented Dickey Fuller method which revealed that the variables were integrated at different orders. The autoregressive distributive lag/bound test was used to explore the long run relationship existing among the variables in our model and the result of the bound test showed that the variables are co-integrated thus the study proceeded in evaluating the long run as well as the co-integrating form in the model. It was found that Foreign Direct Investments to agriculture does not support the growth of the Nigerian economy in the long run as its coefficient turned out negative and insignificant whereas the coefficient of manufacturing and processing was not significant both in the short and long run, mining and quarrying was not significant in the long run, however it was significant in the short run. The study recommended that government can by the use of moral suasion; appeal to foreign investors to plough back about 70% of their earnings so as to expand their output as such expansion will invariably increase the Gross Domestic Products growth; Frantic efforts should also be made through active policies to redirect some of the excess and idle capital in the mining sector to other producing sectors like agriculture and manufacturing as such will help to check the increasing inflation rate caused by idle resources in some overcrowded sectors in the Nigerian economy.*

**Keywords:** Foreign Direct Investment; Economic Growth; Gross Domestic Products; Manufacturing and Processing Sector; Agricultural Sector; Mining and Quarrying Sector.

## 1. Introduction

Operationally, Foreign Direct Investment represents a viable source for filling the savings, foreign exchange, revenue management and technology gaps in less developed countries thereby contributing to higher economic growth (Olusanya, 2013). Foreign Direct Investment has the potential to bring not only more stable capital inflows but also greater technological know-how, higher paying jobs, entrepreneurial and work place skills and new export opportunities (Adelowokan & Maku, 2013).

The influx of Foreign Direct Investment in other developing nations like Brazil, India, Kenya, Ethiopia, and South Africa have shown that some of the sectors in these countries performed better in attracting the required FDI than that of Nigeria, even though, these countries have almost the same historical economic and political background.

Driven by this, promoting and attracting Foreign Direct Investment has become a major component of economic growth strategy for Nigeria especially as competition for Foreign Direct Investment becomes stiff and investors become selective. Since the 1980's the government of Nigeria has been making serious efforts through institutional and legal frameworks, promotional campaigns and so on to encourage Foreign Direct Investment inflows to the country thereby changing her hitherto hostile policy stand towards Foreign Direct Investment (Adelegan, 2000). Specifically, Nigeria's implementation of the IMF monitored liberalization of her economy has improved her regulatory framework for repatriation and providing tax and other incentives to attract foreign investments (Olusanya, 2013).

Despite all these efforts being made by government in favour of Foreign Direct Investment, the Nigeria economy is still characterized by problems which Foreign Direct Investment is theoretically supposed to have addressed, such as inadequate resources for long term development, declining Gross Domestic Products, widespread poverty, high level unemployment, very weak technology base, weak export base, unfavourable balance of payments, unimpressive economic growth and slow pace of economic development among others.

Although, significant scholarly efforts have been made in the past to investigate the relationship between Foreign Direct Investment and Gross

Domestic Products in Nigeria (Adelowokan & Maku, 2013; Olusanya, 2013; Fasaya, 2012; Olokoyo, 2012) there are still some unresolved issues concerning the effects of different sector level Foreign Direct Investment on Nigeria's Gross Domestic Products. In view of the above, it is evident that the desired impact of Foreign Direct Investment has not completely manifested in the Nigerian economy as the country still lacks the volume of foreign investable resource inflows required to fast track the much desired increase in Gross Domestic Products and consequently, economic growth and development. Also, the empirical literature available seem to tow different stands as regards the effect of Foreign Direct Investment on Gross Domestic Products particularly in Nigeria, these extreme stands of previous empirical studies leaves a gap in literature which needs to be filled. Consequently, the objective of this study is to empirically investigate the effect of Foreign Direct Investment on Gross Domestic Products using selected sectoral data in Nigeria.

## 2. Synopsis of Conceptual and Empirical Literature

Foreign Direct Investments is a phenomenon resulting from globalization, which involves the integration of the domestic economic system with global markets. It is accomplished through opening up of the local economic sector as well as domestic capital for foreign investors to establish business, within the economy. Historically, technological advancement led to the emergence of better means of transport and communication. These in turn led to the movement of investors beyond political boundaries, especially during the post-colonial period (Alam & Zubayer, 2010). Even after nations acquired independence, globalization continued to influence trade between investors and foreign countries, whereby the less developed countries were supported by the developed nations to acquire materials and equipment to extract and utilize the available natural resources for economic development (Omri & Kahouli, 2014). However, the equipments needed the appropriate skills to ensure that less developed countries were able to utilize such equipments to their full potential. As economies expanded, trade grew and exchange of goods and services continued to advance. With the less developed economies possessing plenty of raw materials for industries abroad, foreign investment was inevitable, as industries from developed economies sought to establish in the less developed countries where raw materials were available (Desai, Foley & Hines, 2005).

Nevertheless, foreign investments do not come devoid of some negative aspects. There is normally the tendency for over utilization of the available natural resources, as the companies strive to maximize profits in their venture (Anokye & Tweneboah, 2009). The 'tragedy of the commons' whereby many organizations compete to utilize a shared resource leads to degradation of natural resources as well as environmental pollution, which have largely been associated with the issue of climate change (Ruxand & Muraru, 2010).

A nation's GDP is the total value of all final goods and services produced for the market place during the year, within the nation's borders. Abbas, Akbar, Nasir, Ullah and Naseem, (2011) observes, "A nation's GDP is calculated by adding together total consumer spending, total government spending, total business spending and the value of net exports". Gross Domestic Products is one of the essential indicators of a country's economic status or health. It is also used to gauge the living standard of a given country. Ayanwale, (2007) suggests that "Gross Domestic Products can be expressed in nominal or real terms. Nominal GDP reflects the value of all the goods and services which are produced in a country during a given period, using their prices at the time of production. Real Gross Domestic Products also reflects the value of produced goods and services, but it uses constant consumer and producer price indices to remove the effects of rising price levels (inflation). Periods of real Gross Domestic Products growth are thought to promote the welfare of people as economic growth makes it possible for average incomes to increase, which in turn translates to a greater extent of consumption. Periods of negative real Gross Domestic Products growth are associated with lower incomes, lower consumption and consequently a lower standard of living".

The estimation of Gross Domestic Products can adopt a number of approaches. Ekweogu (2013) asserts that "the production estimate hinges on the values using three different methods; the production estimate is based on the value of final output in the economy less the inputs used up in the production process, the expenditure estimate is based on the value of total expenditure on goods and services, excluding intermediate goods and services, produced in the domestic economy during a given period, the income estimate measures the incomes earned by individuals and corporations directly from the production of outputs (goods and services). Further, Ekweogu (2013) infers that "Gross Domestic Products is estimated on a quarterly basis and if perfect data were available, the three approaches would generate equal estimates. Some of the benefits of Gross Domestic Products are and not limited to; Gross Domestic Products is considered the broadest indicator of economic output and growth, Real Gross Domestic

Products takes inflation into consideration, making it possible for comparisons against other historical time periods and that the Bureau of Economic Analysis issues its own analysis document with each GDP release, which is a great investor tool for analyzing figures and trends, and reading highlights of the very lengthy full release".

Borenszteina, De Gregoriob and Lee (1998) tested the effect of Foreign Direct Investments (FDI) on economic growth in a cross-country regression framework. They utilized data on FDI flows from industrial countries to 69 developing countries over the last two decades. Their results suggest that FDI is an important vehicle for the transfer of technology, contributing relatively more to growth than domestic investment. However, the higher productivity of FDI holds only when the host country has a minimum threshold stock of human capital. Thus, FDI contributes to economic growth only when a sufficient absorptive capability of the advanced technologies is available in the host economy.

Ayanwale (2007) investigated the empirical relationship between non extractive FDI and economic growth in Nigeria and also examined the determinants of FDI inflows into simultaneous equation models to examine the relationship. The results suggest that the determinants of FDI in Nigeria are market size, infrastructure development and stable macroeconomic policy. Openness to trade and human capital were found not to be FDI inducing. Also, he found a positive link between FDI and economic growth in Nigeria.

Jyun-Yi and Chin Chiang (2008) examined whether FDI promotes economic growth by using threshold regression analysis. The empirical analysis shows that FDI alone play an ambiguous role in contributing to economic growth based on a sample of 62 countries covering the period from 1975 to 2000 and found that GDP and human capital are important factors in explaining FDI.

Nuzhat (2009) examined the impact of FDI on economic growth of Pakistan. She collected the data of FDI published by the State of Pakistan and the World Bank Development indicators 2008 from 1980 to 2006 with variables of domestic capital and labour force, with the help of endogenous growth theory and applying the regression analysis she concluded that there is a negative insignificant relationship between GDP and FDI inflows in Pakistan.

Olokoyo (2012) examined the effects of Foreign Direct Investment (FDI) on the development of Nigerian economy. The study employed the use of Ordinary Least Square (OLS) regression technique to test the time series data from 1970 — 2007. The regression analysis results did not provide much support for the view of a robust link between FDI and economic growth in Nigeria as suggested by extant previous literatures. Though the result does not imply that FDI is unimportant, the model analysis reduces the confidence in the belief that FDI has exerted an independent growth effect in Nigeria.

Erhieyovwe and Jimoh (2012) assessed the direction of causality between Foreign Direct Investments and Economic growth in Nigeria. An exploratory research design that involves a combination of ordinary Least Squares (OLS), Augmented Dickey Fuller (ADF) unit root test, and the Granger causality test to test if Foreign Direct Investments granger cause Economic growth in Nigeria. The study found that Economic growth (GDP) Does not granger cause Foreign Direct Investment (FDI) in Nigeria.

Ekweogu (2013) empirically determined the impact of FDI on economic growth in Nigeria. The study made use of the ordinary least square (OLS) method of estimation in determining the impact of FDI amid other variables on economic growth from the period of 1980-2010. This study further reveals that FDI have a negative influence on economic growth.

Olusanya (2013) looked at the impact of Foreign Direct Investments inflow and economic growth in a pre and post deregulated Nigerian economy, a Granger causality test was use as the estimated technique between 1970 and 2010. However, the analysis disaggregated the economy into three period; to test the causality between Foreign Direct Investments inflow (FDI) and economic growth (GDP). However, the result of the causality test shows that there is causality relationship in the pre-deregulation era that is 1970 - 1986 from economic growth (GDP) to Foreign Direct Investments inflow (FDI) which means GDP causes FDI, but there is no causality relationship in the post deregulation era that is (1986-2010) between economic growth (GDP) and Foreign Direct Investments inflow (FDI) which means GDP does not cause FDI. However, between 1970 to 2010 it shows that there is causality relationship between economic growth (GDP) and Foreign Direct Investments inflow (FDI) that is economic growth drive Foreign Direct Investments inflow into the country and vice versa.

## 3. Methodology

### 3.1 Research Design

The research design for this study is based on the use of time-series data in the analysis. Therefore, the study adopts the quasi-experimental research design in determining the structural relationship existing between Foreign Direct Investment and Economic growth in Nigeria. Quasi-experimental design is also referred to as survey. According to

(Cook, 1983 cited in Baridam, 2008), quasi-experimental design constitutes a set of empirical studies involving human beings that lack the true major attributes of experimentation. First, they rarely occur in a laboratory, and they do not involve the random assignment of unit to the treatments being contrasted. The quasi-experimental designs are widely used in administrative and social sciences research because of the complex relationship that exists between variables, such relationship is not subject to manipulation. Therefore the choice of quasi-experimental research design is premised on the fact that the research variables cannot be subjected to controlled laboratory tests which make the experimental design option not suitable for this study.

**3.2 Sources of Data**

The major source of data employed in this study is the secondary source. Thus, the data for this research analysis is obtained from various issues of the Central Bank of Nigeria Statistical bulletin (1970 to 2016). These data covered information on Foreign Direct Investments, and gross domestic products (economic growth) for the periods under investigation. The data for Foreign Direct Investments is proxied by FDI in mining and quarrying, manufacturing and processing, and agriculture.

**3.3 Model Specification**

**Economic Growth Model**

The Economic Growth model is based on the work of Feridun and Sissoko (2011) that examined the relationship between economic growth as measured by GDP per capita and Foreign Direct Investments for Singapore, using the methodology of Granger causality and vector auto regression (VAR) and Olokoyo (2012) that examined the effects of Foreign Direct Investments (FDI) on the development of Nigerian economy. Thus, the Economic growth model is stated as:

$$GDPr = f(FDIAF, FDIMP, FDIMQ) \quad (1)$$

Stating the exact or mathematical form of (1) above we have:

$$GDPr = \alpha_0 + \alpha_1(FDIAF)_t + \alpha_2(FDIMP)_t + \alpha_3(FDIMQ)_t \quad (2)$$

Economic relationships are inexact therefore stating (2) above in econometric form we have:

$$GDPr = \alpha_0 + \alpha_1(FDIAF)_t + \alpha_2(FDIMP)_t + \alpha_3(FDIMQ)_t + U \quad (3)$$

***Apriori Expectation***

Foreign Direct Investments (FDI) on the development of Nigerian economy. Foreign Direct Investments is assumed to benefit a developing country like Nigeria, not only by supplementing domestic investment, but also in terms of employment creation, transfer of technology, increased domestic competition and other positive externalities. Therefore we expect a positive relationship between FDI and Economic Growth (GDP).

Where:

FDIAF = Foreign Direct Investments in Agriculture
FDIMP = Foreign Direct Investments in Manufacturing and Processing
FDIMQ = Foreign Direct Investments in Mining and Quarrying
GDPr = Goss Domestic Product Growth Rate

**3.4 Data Analysis and Estimation Technique**

This study adopted econometric technique. According to Theil (1971) cited in Gujarati and Sangeetha (2007), econometrics is concerned with the empirical determination of economic laws. It is a combination of economic theory, mathematical economics and statistics but it is completely distinct from each of these three branches of science (Koutsoyianis, 1977).

In line with the above, an Autoregressive Distributed Lag (ARDL)/bound testing approach developed by Pesaran, Shin and Smith (2001) was adopted to establish a long run relationship between the variables in each model. This approach was adopted because it can be used without considering the order of integration of variables, i.e. it can be used with a mixture of variables integrated at levels 1(0), variables integrated at first difference 1(1) or variables that are fractionally integrated (see Persaran et al, 2001). But for the avoidance of having any variable integrated at order 2, we used the Augmented Dickey Fuller (ADF) test to formally explore the stochastic properties of each individual series. Another reason why this approach was adopted is because it involves a single equation setup, making it simple to implement and interpret. Also, different variables can be assigned different lag lengths as they enter the model. And finally because of its extra robustness and better performance for small

International Journal of Research
Available at https://pen2print.org/index.php/ijr/
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

sample size such as this study period (see Pesaran & Shin, 1997). The bound test is based on the F-test which has a non-standard distribution and with two sets of critical bounds provided by Pesaran, Shin and Smith (2001). The lower critical bound assumes that all the variables are integrated at levels 1(0), while the upper bound assumes all the variables to be integrated at first difference 1(1).

The generic form of the autoregressive distributed lag, unrestricted Error Correction Model is given as:

$$\Delta Y_t = \alpha_0 + \sum_{t=1}^{K1} \alpha_1 i \Delta Y_{1t-i} + \sum_{t=0}^{K2} \alpha_2 i \Delta X_{1t-i} + \sum_{t=0}^{K3} \alpha_3 i \Delta X_{2t-i} + \cdots + \sum_{t=0}^{K4} \alpha_n i \Delta X_{nt-i} + \theta_0 Y_{t-1} + \theta_1 X_{1t-1} + \theta_2 X_{2t-1} + \theta_n X_{nt-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

The test for the Null hypothesis of no co-integration against the alternative of the existence of a long run relationship is given as:

$H_0: \theta_0 = \theta_1 = \theta_2 = \theta_n = 0$

$H_1: \theta_0 = \theta_1 = \theta_2 = \theta_n \neq 0$

If the computed F-statistic exceeds the upper bound critical values for the asymptotic distribution of the F-statistic provided by Pesaran, Shin & Smith (2001), we conclude that there is co-integration i.e., the null is rejected. On the other hand, if the computed F-statistic falls below the lower bound critical value, we conclude that the variables are 1(0) and the null of no co-integration cannot be rejected. If the F-statistic falls between the bounds, the test is inconclusive.

Recasting (3) in consonance with equation (4) we have:

$$(GDPr)_t = \alpha_0 + \sum_{t=1}^{K1} \alpha_1 i \Delta (GDPr)_{t-i} + \sum_{t=0}^{K2} \alpha_2 i \Delta (FDIAF)_{t-i} + \sum_{t=0}^{K3} \alpha_3 i \Delta (FDIMP)_{t-i} + \cdots + \sum_{t=0}^{K4} \alpha_4 i \Delta (FDIMQ)_{t-i} + \theta_0 (GDPr)_{t-1} + \theta_1 (FDIAF)_{t-1} + \theta_2 (FDIMP)_{t-1} + \theta_3 (FDIMQ)_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

## 4. Data Presentation, Analysis and Interpretation of Results

Pre-estimation, estimation and post estimation tests are carried out and presented in this chapter and result are discussed. Qualitative analysis was also carried out to substantiate the findings of the quantitative analysis.

**Table 1: Data for FDI in Agriculture, Manufacturing and Mining and GDP Growth Rate all expressed in Percentages**

| Year | FDIMP (%) | FDIAF (%) | FDIMQ (%) | GDPR (%) |
|---|---|---|---|---|
| 1970 | 22.4 | 1 | 4.534863 | 4.534863 |
| 1971 | 28.6 | 1.2 | 5.458752 | 5.458752 |
| 1972 | 22.7 | 0.6 | 4.739777 | 4.739777 |
| 1973 | 23.2 | 0.4 | 5.978892 | 5.978892 |
| 1974 | 20.7 | 1 | 8.733014 | 8.733014 |
| 1975 | 22.2 | 0.8 | 5.752583 | 5.752583 |
| 1976 | 23.5 | 0.9 | -6.51026 | -6.51026 |
| 1977 | 27.8 | 3 | -6.11898 | -6.11898 |
| 1978 | 44.1 | 4.3 | 7.858332 | 7.858332 |
| 1979 | 44.5 | 3.8 | 8.226253 | 8.226253 |
| 1980 | 41.5 | 3.3 | 8.477287 | 8.477287 |
| 1981 | 45.4 | 3.2 | 8.706424 | 8.706424 |
| 1982 | 37.7 | 2.2 | 7.93616 | 7.93616 |
| 1983 | 35.8 | 2.1 | -6.40126 | -6.40126 |
| 1984 | 32.9 | 2 | 6.564985 | 6.564985 |
| 1985 | 33.7 | 1.9 | 6.548508 | 6.548508 |
| 1986 | 30 | 1.4 | -7.35794 | -7.35794 |
| 1987 | 31.2 | 1.2 | 5.763318 | 5.763318 |
| 1988 | 32.2 | 1.1 | -8.43124 | -8.43124 |
| 1989 | 49.6 | 1.2 | 9.767416 | 9.767416 |
| 1990 | 60.7 | 3.2 | 10.51858 | 10.51858 |

International Journal of Research
Available at https://pen2print.org/index.php/ijr/
e-ISSN: 2348-6848
p-ISSN: 2348-795X
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November 2018

| | | | | |
|---|---|---|---|---|
| 1991 | 71 | 3.1 | 9.385906 | 9.385906 |
| 1992 | 47.5 | 1.9 | -11.7795 | -11.7795 |
| 1993 | 19.3 | 1.8 | 10.21214 | 10.21214 |
| 1994 | 19.9 | 1.7 | -11.3533 | -11.3533 |
| 1995 | 23.2 | 1 | -12.8755 | -12.8755 |
| 1996 | 24.3 | 1 | -11.5741 | -11.5741 |
| 1997 | 24.4 | 0.9 | 7.674432 | 7.674432 |
| 1998 | 22.6 | 0.8 | -12.9976 | -12.9976 |
| 1999 | 23.5 | 0.8 | -13.3898 | -13.3898 |
| 2000 | 23.7 | 0.8 | 13.35074 | 13.35074 |
| 2001 | 23.5 | 0.8 | 10.80927 | 10.80927 |
| 2002 | 24 | 0.7 | -13.9351 | -13.9351 |
| 2003 | 25.6 | 0.7 | -12.6903 | -12.6903 |
| 2004 | 26.5 | 0.7 | 14.62569 | 14.62569 |
| 2005 | 0.01 | 4.6 | 14.89632 | 14.89632 |
| 2006 | 34.5 | 0.2 | 15.38676 | 15.38676 |
| 2007 | 30.4 | 0.18 | 15.37537 | 15.37537 |
| 2008 | 15.9 | 0.2 | 15.75634 | 15.75634 |
| 2009 | 13.5 | 0.98 | 15.23373 | 15.23373 |
| 2010 | 19.9 | 1.61 | 15.28116 | 15.28116 |
| 2011 | 13.6 | 1.13 | 15.1669 | 15.1669 |
| 2012 | 16.8 | 1.41 | 15.66916 | 15.66916 |
| 2013 | 22.8 | 1.8 | 13.4816 | 13.4816 |
| 2014 | 17.32 | 1.38 | 15.20729 | 15.20729 |
| 2015 | 18.08 | 1.46 | 15.48461 | 15.48461 |
| 2016 | 17.72 | 1.43 | 13.45655 | 13.45655 |

**Source:** Central Bank of Nigeria Statistical Bulletin (1970-2016)

### 4.1 Pre-Estimation Test

The data pre-subjected to descriptive statistics and the result is presented on table 4.2 below.

**Table 2: Descriptive Statistics**

| | FDIAF | FDIMP | FDIMQ | GDPR |
|---|---|---|---|---|
| Mean | 1.550638 | 28.29638 | 23.44319 | 4.277447 |
| Median | 1.200000 | 24.00000 | 22.60000 | 4.410000 |
| Maximum | 4.600000 | 71.00000 | 54.70000 | 33.74000 |
| Minimum | 0.180000 | 0.010000 | -6.600000 | -13.13000 |
| Std. Dev. | 1.065367 | 12.72252 | 19.63315 | 7.871906 |
| Skewness | 1.212099 | 1.128214 | 0.064673 | 1.012879 |
| Kurtosis | 3.806263 | 4.980580 | 1.491270 | 6.716483 |
| Jarque-Bera | 12.78165 | 17.65274 | 4.490450 | 35.08538 |
| Probability | 0.001677 | 0.000147 | 0.105904 | 0.000000 |
| Sum | 72.88000 | 1329.930 | 1101.830 | 201.0400 |
| Sum Sq. Dev. | 52.21028 | 7445.679 | 17731.19 | 2850.478 |
| Observations | 47 | 47 | 47 | 47 |

**Source:** Eview Data Output, 2018

From the above table, the mean values are 1.55, 28.29, 23.44 and 4.27 for foreign direct investment inflows for agriculture, manufacturing and processing, mining and quarrying and gross domestic production growth rate respectively. From these, the data suggests that FDI to the agricultural sector is the least relative to FDI to manufacturing and processing and mining and quarrying.

The standard deviation showed that foreign direct investment in the agricultural sector (FDIAF) has a smaller spread relative to foreign direct investment

International Journal of Research
Available at https://pen2print.org/index.php/ijr/
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 05 Issue 22
November 2018

to manufacturing and processing and mining and quarrying used in this study. The standard deviation for gross domestic products growth rate (GDPR) stood at 7.87.

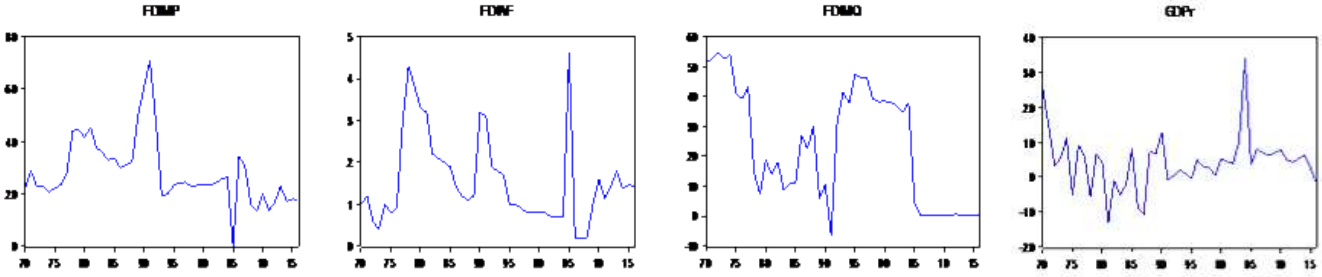
The table also shows that FDI to manufacturing and processing had the highest inflow in relation to agriculture and mining and quarrying. The agricultural sector had its highest/maximum as 4.6% which is far below mining and quarrying that recorded 54.70% and 71% for manufacturing and processing. This suggests that the agricultural sector receive very little attention from foreign investors. Furthermore, the minimum for agricultural FDI stood at 0.18% which was greater than both that for manufacturing and processing and mining and quarrying. This implies that FDI to agriculture is much more stable than FDI to the other subsectors.

The gross domestic products growth rate recorded 33.74 as its maximum value. This maximum was recorded in the year 2004 and a minimum of -13.13 recorded in the year 1981.

Table 2 further reveal that all the data for the respective variables have a positive tail. This is evidenced by their skewness coefficients. The Jarque-Bera test statistics which compares the difference between the skewness and kurtosis calculated with that of normal distribution shows that all variables except foreign direct investment in mining and quarrying are not normally distributed given their respective probability values.

**4.2 Plots for the Series**

All the series were plotted individually and presented below on figure 1



**4.3 Unit Root Test**

The series were subjected to the Augmented Dickey-Fuller (ADF) test to explore their stochastic properties. The result of the ADF test is presented below on table 3.

**Table 3: Unit Root Result**

| VARIABLE | LEVEL | | 1ST DIFFERENCE | | REMARK |
|---|---|---|---|---|---|
| | C | C&T | C | C&T | |
| FDIAF | -3.80* | -3.96** | -8.70 | -8.60 | I(0) |
| FDIMP | -2.82 | -3.28 | -7.08* | -7.00* | I(1) |
| FDIMQ | -2.03 | -2.32 | -7.90* | -7.81* | I(1) |
| GDPr | -5.88* | -5.98* | -8.95 | -8.83 | I(0) |

C is Intercept, C&T is Intercept and Trend. * indicate significance at 1% and ** indicate significance at 5%.

**Source:** Eview Data Output, 2018

The formal unit root result presented on table 3 above shows that some of the variables (series) had the presence of unit root while some had no unit root. In other words, some of the series were stationary at level while some were stationary at first difference. For instance, Foreign Direct Investment in Agriculture (FDIAF) and Gross Domestic Product growth rate (GDPr) were stationary at level or integrated at order zero I(0) while foreign direct investment in manufacturing and processing (FDIMP), and foreign direct investment in mining and quarrying (FDIMQ) were stationary at first difference or integrated at order one I(1). This result suggest that we may likely estimate a spurious relationship using the data without differencing therefore we explore the long run relationship existing (if any) among our variables in various models. To this end, we adopt the Autoregressive Distributive Lag/Bound testing procedure put forward by Pesaran *et al* (2001) as it allows for the combination of variables integrated at order 1 and order 0.

**4.4 Autoregressive Distributive Lag/Bound Test Economic Growth Model**

About five hundred models were estimated from which the most preferred model was chosen using

International Journal of Research
Available at https://pen2print.org/index.php/ijr/
e-ISSN: 2348-6848
p-ISSN: 2348-795X
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the Akaike model selection criterion (AIC). Figure 2 below is a chart of the top twenty models.

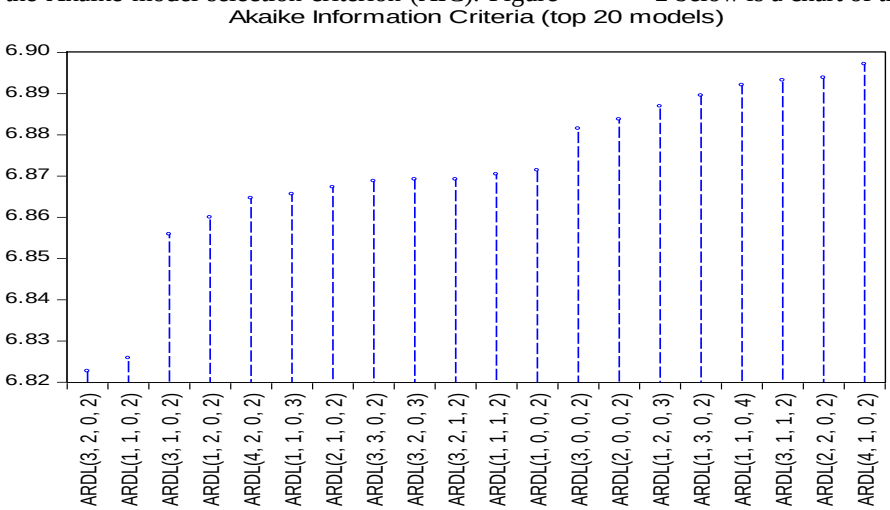


**Figure 2:** Top twenty models preferred by AIC
**Source:** Eview Data Output, 2018

From the diagram, the most preferred model among the top twenty models is (ARDL 3,2,0,2). Extract of this preferred model is presented below on table 4.

**Table 4: ARDL Model (3, 2, 0, 2)**

| Variable | Coefficient | t-Statistic | Prob.* |
|---|---|---|---|
| GDPR(-1) | 0.12 | 0.70 | 0.48 |
| GDPR(-2) | -0.22 | -1.21 | 0.23 |
| GDPR(-3) | 0.29 | 1.95 | 0.05 |
| FDIAF | -0.22 | -0.16 | 0.87 |
| FDIAF(-1) | -1.18 | -0.72 | 0.47 |
| FDIAF(-2) | -2.40 | -1.64 | 0.10 |
| FDIMP | 0.05 | 0.53 | 0.59 |
| FDIMQ | 0.09 | 0.78 | 0.43 |
| FDIMQ(-1) | -0.34 | -2.55 | 0.01 |
| FDIMQ(-2) | 0.24 | 2.23 | 0.03 |
| C | 7.10 | 1.90 | 0.06 |

R – Square 0.39, Adjusted R-Square 0.20 F-Stats: 2.12, Prob. 0.05
**Source:** Eview Data Output, 2018

The first and third lag of the dependent variable shows that the previous values of GDP growth is positively related to its present value while the second lag showed otherwise. These lagged values are not significant except the third lag that is marginally significant at 10% given their respective probability values. The coefficient of Foreign Direct Investment in Agriculture (FDIAF) and its associated lagged values (first and second lag) showed negative suggesting that FDI flows to the agricultural sector inhibit the growth of the economy. Specifically, a 1% increase in FDI flow to the agricultural sector in a current period reduces the growth of the Nigerian economy by about 0.22%. A 1% increase in FDI flow to agriculture in a previous year reduces the growth of the economy by 1.18% in the current years and 1% increase in two previous year reduces growth by 2.40%. These coefficients of FDI to agriculture are not significant given their respective probability values.

The coefficient of FDI to manufacturing production shows that FDI flows to manufacturing and processing is positively related to the growth of the Nigerian economy. Specifically, an increase of FDI to manufacturing and processing by 1% increases economic growth by 0.5%. This however is not

significant given its probability value. The coefficient of FDI to mining and quarrying subsector and its second lag suggest that FDI flows to mining and quarrying is positively related to the growth of the Nigerian economy but its first lag suggests otherwise and the lagged coefficients are significant given their probability values.
The R-square value of about 0.39 shows that the explanatory variables explain about 39% of the variation in the dependent variable the remaining 61% is explained by variables equally important to the model but not explicitly stated in the model. The F-statistic value and its associated probability value show that the entire model is significant at 5% significance level.

**Table 5: Extract of Bound Test**

ARDL Bounds Test

Sample: 1973 2016

Included observations: 44

Null Hypothesis: No long-run relationships exist

| Test Statistic | Value | k |
|---|---|---|
| F-statistic | 4.920425 | 3 |
| Critical Value Bounds | | |
| Significance | I0 Bound | I1 Bound |
| 10% | 2.72 | 3.77 |
| 5% | 3.23 | 4.35 |
| 2.5% | 3.69 | 4.89 |

**Source:** Eview Data Output, 2018.
It is required that the error term from the ARDL model should be serially independent otherwise the parameter estimates will not be consistent due to the lagged values of the independent variables that appear as regressors in the model. To this end, we look out for the serial independence of the error term using correlogram presented in the appendix. It is evident that there is no autocorrelation in the residuals of the model. Thus, there is serial independence of the residuals in the model. The autocorrelation and partial correlation suggest the absence of serial dependence of the error term given that all probability values are greater than 5%.

**4.6 Co-integrating and Long Run Form**

**4.5 Bound Test**
The ARDL model (3, 2, 0, 2) was subjected to bound test to explore the long run relationship among the variables and the result is presented below on table 4.5 from the result, the null hypothesis of no long run relationship existing among the variables was rejected as the calculated f-statistic of 4.92 is greater than the upper critical bound of 4.35 at 5%. Thus, the variables in the economic growth model are co-integrated. Put differently, the variables have long run relationship among them.

The long run and co-integrating form are presented below on table 6. The result shows that in the long run Foreign Direct Investment to Agriculture in Nigeria is inversely related to economic growth. Specifically, a 1% increase in FDI flow to the agricultural subsector reduces economic growth by about 4.76%. This negates the apriori expectation. Foreign Direct Investment to Manufacturing and Processing is positively related to economic growth suggesting that it spurs growth in the Nigerian economy, however it is not significant given its associated probability value of 0.61 which is greater than 5% significance level. Furthermore, Foreign Direct Investment to Mining and Quarrying subsector is inversely related to economic growth in the long run. However, the coefficient is not significant given its probability

value of 0.93 which is greater than 5% significance level.

The co-integrating form which is the equivalent to the famous error correction mechanism shows that in the short-run, all coefficients are not significant except the coefficient of one period for mining and quarrying. The one period lag of mining and quarrying is inversely related to economic growth suggesting that FDI flows to mining and quarrying inhibits economic growth in Nigeria. While the contemporaneous effect of FDI to mining and quarrying is positively related but not significant. Furthermore, foreign direct investment to manufacturing and processing is positively related to economic growth but the coefficient is not significant given its probability value of 0.59 which is greater than 5% significance level. The contemporaneous effect of foreign direct investment to agriculture is negatively related to economic growth whereas its one period lag suggest otherwise. However, they are both not significant given their probability values of 0.87 and 0.10 which are greater than the 5% significance level. The error correction term which measures the speed of adjustment shows up with the appropriate negative sign and is significant with a probability value of 0.001 which is less than 5% significance level. Specifically the error correction term shows that 80% of disequilibrium is reconciled annually. That is, disturbances or shocks in any previous period to the long run relationship are adjusted back to equilibrium in the current period. Thus, the error correction term appearing with the appropriate negative sign and been significant further buttresses the fact that the variables are co-integrated as suggested by the bound test.

**Table 6: ARDL Co-integrating and Long Run Form**

ARDL Co-integrating And Long Run Form

Dependent Variable: GDPR

Selected Model: ARDL(3, 2, 0, 2)

Sample: 1970 2016

Included observations: 44

Co-integrating Form

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(GDPR(-1)) | -0.071677 | 0.199373 | -0.359514 | 0.7215 |
| D(GDPR(-2)) | -0.293787 | 0.150010 | -1.958448 | 0.0587 |
| D(FDIAF) | -0.226314 | 1.378779 | -0.164141 | 0.8706 |
| D(FDIAF(-1)) | 2.400650 | 1.457228 | 1.647408 | 0.1090 |
| D(FDIMP) | 0.053986 | 0.101152 | 0.533708 | 0.5971 |
| D(FDIMQ) | 0.090811 | 0.115508 | 0.786182 | 0.4374 |
| D(FDIMQ(-1)) | -0.247228 | 0.110767 | -2.231960 | 0.0325 |
| CointEq(-1) | -0.800473 | 0.228979 | -3.495837 | 0.0014 |

Cointeq = GDPR - (-4.7675*FDIAF + 0.0674*FDIMP -0.0064*FDIMQ + 8.8760)

Long Run Coefficients

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| FDIAF | -4.767522 | 2.236307 | -2.131873 | 0.0406 |
| FDIMP | 0.067442 | 0.133345 | 0.505775 | 0.6164 |
| FDIMQ | -0.006352 | 0.076058 | -0.083515 | 0.9339 |
| C | 8.876046 | 3.933417 | 2.256574 | 0.0308 |

**Source:** Eview Data Output, 2018.

## 5. Conclusion and Recommendations

### 5.1 Conclusion

Several interesting conclusions are drawn from this study. First, in the long run Foreign Direct Investments in Agriculture (FDIAF) is inversely related to Economic Growth (GDPr) as suggested by the negative and significant coefficient. Similarly in the short-run, FDIAF is inversely related to GDPr but not significant. This shows that FDIAF inhibited economic growth in Nigeria for the period covered by this study. Foreign Direct Investments in Manufacturing and Processing (FDIMP) is positively related to Economic Growth (GDPr) but not significant both in the long and short run. This shows that FDIMP has not been enough to significantly stimulate growth in the Nigerian economy. Foreign Direct Investments in Mining and Quarrying (FDIMQ) is inversely related to Economic Growth (GDPr) but not significant in the long run whereas it is significant in the short run. This is as a result of FDI inflows to Mining and Quarrying been directed to oil and gas explorative and exploitative activities which mainly engage semi-skilled and unskilled work force at the construction/fabrication stages of oil and gas plants and equipment. These engaged workers are laid off immediately after construction phase is completed.

### 5.2 Recommendations

1. Government can by the use of moral suasion; appeal to foreign investors to plough back about 70% of their earnings so as to expand their output as such expansion will invariably increase the Gross Domestic Products growth.
2. Frantic efforts should also be made through active policies to redirect some of the excess and idle capital in the mining sector to other producing sectors like agriculture and manufacturing as such will help to check the increasing inflation rate caused by idle resources in some overcrowded sectors in the Nigerian economy.
3. Tax holidays should be granted to investors in Agriculture and Manufacturing & Processing sectors so as to encourage Foreign Direct Investments inflow to these subsectors which will no doubt stimulate growth, create more jobs, make more commodities available thereby check-mating demand and supply induced inflation.
4. The Nigerian Investment Promotion Council (NIPC) Act and the Foreign Exchange Monitoring and Miscellaneous Provision Act (FEMMPA) should be revisited so as to reduce legalities that inhibit profit repatriation by foreign investors. The Chinese model for profit repatriation that allows foreign investors assess to completely repatriate their earnings/profits after tax to their parent countries, which has contributed immensely in stimulating Foreign Direct Investments inflows to China should be adopted and modified to suit our peculiarities.
5. Recently Nigeria was ranked 145$^{th}$ out of 190 countries by The World Bank as regards Ease of Doing Business Index for 2018 moving up 24 points from 169$^{th}$ position in the 2017 ranking. This feat according to the Bretton Wood Institution was achieved by improving access to getting credit. More can still be done to close rank with other industrialised nations of the world which no doubt will encourage the inflow of Foreign Direct Investments into critical sectors of the economy.

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