

## The Effect of Foreign Direct Investment on Nigeria's Economic Development (1984-2018)

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### Abstract

*This research explored issues pertaining to sectorial allocation of FDI in the major sectors of the Nigerian economy. It focused on the effect of sectorial FDI on Nigerian economy in terms of Gross Domestic Product per capita (GDPpc) and Human Development Index (HDI). It estimated the effect of FDI on economic development employing sectorial data inflows of FDI to Nigeria from 1984 to 2018 (inclusive). Previous studies using sectorial inflows of FDI failed to reach some sort of consensus. However, this study provides an insight to sectorial FDI inflows by evaluating the cross-sector effect of FDI on growth and development. The central objective of the work was to determine the effect of FDI inflows to Mining & Quarrying (FDIMQ), Manufacturing & Processing (FDIMP), Agricultural Sector (FDIAG), Transport & Communication (FDITC), Building & Construction (FDIBC) and Trade & Business (FDITB). The effects seemed to be varying across the various economic sectors, with FDI in the manufacturing and processing sector having the greatest effect on GDPpc and HDI. On the other hand, FDI in the mining and quarrying sector appeared to have impacted positively on GDPpc, while, FDI in the agricultural sector, and FDI in the building and construction sector tended to have some degree of positive effects on HDI but negatively on GDPpc. Based on the findings, the study recommends amongst others that government should encourage the inflow of more FDI into the various sectors by creating an enabling environment and formulating strategic socio-economic policies that would enhance the ease of doing business in Nigeria.*

**Keywords:** Foreign Direct Investment, Gross Domestic Product, Gross Domestic Product Per Capita, Human Development Index

### INTRODUCTION

In recent times, owing to the increasing globalization of the world economy and the liberalization of exchange rates and market access, there is a large amount of capital that moves across borders. Most economies encourage the free flow of capital across national borders, mainly because it allows capital to seek the highest returns. According to Grossman & Helpman (2015), the free flow of capital also assists in diversification of assets and reduction of the risks faced by capital owners. Furthermore, global capital mobility encourages the transfer of investments, especially to regions such as Sub-Saharan Africa, where most of the economies are still developing.

Foreign direct investment (FDI) is largely carried out by multi-national corporations (MNCs). MNCs provide net transfers of real capital from one country to another, and they represent entry into a host economy by a business organization established in a foreign geographical enclave (Asiedu and Lien, 2011). MNCs are veritable tools for carrying out important roles through direct investment. The FDI process occurs when parent corporations carry out vertical or horizontal expansion of operations. FDI also occurs when parent

companies diversify their investments. By broadening their operations to produce the same good abroad, international corporations take advantage of horizontal expansions by way of introducing some highly demanded commodities straight into geographically segmented or tariff-controlled markets (Adelegan, 2008; Akindoyemi, 2011; Awosusi & Awolusi, 2014). Vertical expansions are profitable to MNCs by providing cheaper markets within which to produce intermediary goods (Kok & Ersoy, 2009). This is often the case with developing regions like Africa, with favourable exchange rates and relative abundance of labour.

Nigeria is a developing country, like other developing economies, it needs investments from within and outside, to develop. This study focuses on the investment from outside. In other words, we are looking at those factors that determine the inflow of Foreign Direct Investment into Nigeria. FDI as a major component of international capital-flows is an investment made to acquire lasting interest in enterprises outside the shores of the home office or country of the investor (Ibrahim & Omoniyi, 2011).

According to Gupta & Singh (2016) foreign direct investment comprises not only mergers and acquisitions and new investment, but also reinvested earnings, loans and similar capital transfer between parent companies and their affiliates. Such investments may take the form of either “greenfield” investment, also called “mortar and brick” investment or merger and acquisition (M&A), which entails the acquisition of existing interests, rather than new investment. In a nutshell, ownership of at least 10% of the ordinary shares of voting stock is the criterion for the existence of a direct investment relationship, while ownership of less than 10% is recorded as portfolio investment (Muhammed, Azu and Oko, 2018).

One of the most salient features of today’s globalization drive is conscious encouragement of cross-border investments, especially by MNCs. Many countries (especially developing ones) now see FDI as an important element in their strategy for economic development. This is most probably because FDI is seen as an amalgamation of capital, technology, marketing and management.

The overall economic trend in a country is the key important factor of its business environment, and a growing economy with a considerably high and sustained growth rate in its Gross Domestic Product (GDP) over a long period of time builds business confidence and attracts FDI (Dwivedi, 2009). The competitive advantage of FDI mainly relies on location. Firms will trade and invest globally when they have some advantages over indigenous firms and where there is an imperfect market structure to explore these advantages (Dwivedi, 2009; Grossman & Helpman, 2015). Portfolio investment is hinged on the account of differences in interest rates, thus, capital will flow to location with the highest returns on investment. The major difference between portfolio investment and direct investment is that portfolio investors are creditors to the firm, hence, they get their returns first while direct investors are the owners of the firm which means they have control over the firms but may likely get their returns after all stakeholders have received theirs (Dwivedi, 2009, Pandey, 2015).

Theoretically, interest rate being the basis of capital flow from one location to the other has been highly criticised as it does not address the area of control that investors are also interested in, rather, it suggests that investors are only keen on investing overseas where interest rates are higher and where there are little risks to the flow of capital (Adelegan, 2000; Kok & Ersoy, 2009; Grossman & Helpman, 2015).

Several authors have attempted to explain the determinants of FDI and its effects on economic growth, however, there is no generally accepted theory as every new concept adds new knowledge and expresses disapproval to previous theories. Empirical studies on FDI have deepened the knowledge of economic behaviour at micro and macro levels, giving rise to new areas of study in economic theory. In order to comprehend the key determinants of FDI and its impact on economic growth, there must be a thorough understanding of the

motives that encourage firms and investors to invest outside the shores of their home office or country rather than for them to export (Awosusi and Awolusi, 2014).

### **STATEMENT OF THE PROBLEM**

Nigeria as a country, given her natural resource-base and large market size, qualifies to be a major recipient of FDI in Africa and indeed is one of the top three leading African countries that consistently received FDI in the past decades. However, the level of FDI attracted by Nigeria is insignificant compared with the resource base and potential needs of the country. Foreign Direct Investment means capital flow across borders; it is certainly not a real and tangible economic opportunity, but rather a perceived opportunity. Capital may flow into a country because of speculative bubble on the way there or an over-hyped view of economic prospects. This inflates assets prices and domestic currency, attracting more foreign capital in a self-perpetuating process. Some of the funds may be used for useful investment, but much may be squandered on property speculation or credit-based consumption, including consumption of foreign goods made cheap by an overvalued currency.

Eventually, some investors realize what was happening and withdraw their investments; the result is a stampede of fund out of the country (Capital Flight). The currency will collapse far below its equilibrium value, triggering import-driven inflation and making it difficult to purchase essential supplies from abroad. Banks may also collapse, if they had not hedged their exposure to extreme currency movements. Domestic firms may find it impossible to get trade finance denominated in major currencies ultimately, these developments lead to losses or insolvency for domestic firms, mass unemployment, a downward spiral in aggregate demand and a deep recession. The values of assets remain distorted for years or subject to excess volatility under the influence of speculative capital flow, causing misallocation of resources in the real economy.

However, irrespective of the above disadvantages which the countries often experience, they still continue to seek for a way to attract foreign investments into the country, implying that there are still some advantages that it offers. Based on the above, the need to investigate the effect of Foreign Direct investment on Economic Development cannot be overemphasised.

### **OBJECTIVES OF THE STUDY**

The main objective of this work is to determine the effect of foreign direct investment on economic development of Nigeria. The following specific objectives are set out to be achieved:

1. To assess the effect of foreign direct investment in mining & quarrying on economic development of Nigeria.
2. To examine the effect of foreign direct investment in manufacturing & processing on economic development of Nigeria.
3. To ascertain the effect of foreign direct investment in agricultural sector on economic development of Nigeria.
4. To assess the effect of foreign direct investment in transport & communication on economic development of Nigeria.
5. To examine the effect of foreign direct investment in building & construction on economic development of Nigeria.
6. To determine the effect of foreign direct investment in trading & business on economic development of Nigeria.

### **RESEARCH QUESTIONS**

The following research questions are presented for this study and the answers to these questions will be provided at the end of the work. The answers that will emanate from the questions will enable us solve the above stated problem. The questions are as follows:

1. To what extent does foreign direct investment in mining/quarrying impact on Nigeria's economic development?
2. How significant is the effect of foreign direct investment in manufacturing/processing on economic development of Nigeria?
3. To what extent has foreign direct investment in agricultural sector affects economic development in Nigeria?
4. How significant is the effect of foreign direct investment in transport/communication on economic development in Nigeria?
5. To what degree does foreign direct investment in building/construction impact on economic development of Nigeria?
6. How significant is the effect of foreign direct investment in trading/business on Nigeria's economic development?

### **HYPOTHESES**

The study was guided by the following hypotheses:

- HO<sub>1</sub>:** Foreign direct investment in mining/ quarrying sector has no significant effect on economic development of Nigeria
- HO<sub>2</sub>:** Foreign direct investment in manufacturing/processing sector has no significant effect on economic development of Nigeria
- HO<sub>3</sub>:** Foreign direct investment in agricultural sector has no significant effect on economic development of Nigeria.
- HO<sub>4</sub>:** There is no significant effect of foreign direct investment in transport/communication on economic development of Nigeria.
- HO<sub>5</sub>:** There is no significant effect of foreign direct investment in building/construction on economic development of Nigeria.
- HO<sub>6</sub>:** There is no significant effect of foreign direct investment in trading/business on economic development of Nigeria.

### **SCOPE OF THE STUDY**

The study covers the period of 1984 – 2018 (inclusive), a period of 35 years which is long enough to eliminate bias that could arise from short-term phenomenon. This period of time was chosen with consideration to the fact that it was the era when the Nigerian economy was liberalized. And the period also witnessed a boom in the oil sector of the Nigerian economy. More importantly, the research critically studied this period to see how FDI of different sectors has impacted on the growth and development of the Nigerian economy. For almost two decades, Nigeria has experienced uninterrupted constitutional democracy and it is worthwhile to examine FDI as it were and its determinants under civilian rule as well as in the era of military rule. The study utilizes annual data on real economic growth using indicators such as Gross Domestic Product, Export, Exchange Rate and Inflation as reported and published in the Central Bank of Nigeria (CBN) Statistical Bulletin, World Bank Investment Report and publications from United Nations Conference on Trade and Development (UNCTAD).

### **LITERATURE REVIEW: THEORETICAL REVIEW**

The literature review of this study highlights the theories on which the concept of this research is based. These theories specifically address the need for foreign capital across national boundaries and how these flows of foreign investment can basically result into

increase in output and economic activities for the host economy and its sustainability over the years for economic development.

## **ECONOMIC AND FOREIGN DIRECT INVESTMENT THEORIES**

There exists a wide array of literature regarding the importance of international trade and investment to a country's economy especially welfare, growth and development. The foundation for empirical research about the interaction and relationship of economic variables is drawn from economic theory, neoclassical and endogenous growth models.

### **EXPORT THEORIES**

The export theory can be classified under the neoclassical growth models. This theory is a culmination of a study by Adam Smith, 1776 as cited in Dwivedi (2009) who investigated the causes of wealth of countries. The underlying argument of the export theory is that "countries need to export goods and services in order to generate revenue to finance imports which cannot be produced indigenously" (Dwivedi, 2009; Grossman and Helpman, 2015). Undoubtedly, gross domestic product (GDP) is used as a proxy of a country's economic growth and it provides an estimate of the value of goods and services produced in a country in a specified period (Dwivedi, 2009, Gupta and Singh, 2016). Studies that have been undertaken to ascertain whether international trade influences GDP assume that as exports increase, *ceteris paribus*, the GDP of a country rises and spurs economic growth. The export theory can be interpreted in a way that the performance of exports has a stimulating effect to a country's economy, especially in form of technology spill overs (Dutse, 2008; Dwivedi, 2009; Tokpu, 2010). Grossman & Helpman (2015) indicate that owing to the demands of international markets such as continuous innovation and improved efficiency; there is increased specialization which encourages utilization of economies of scale. The export theory thus, predicts that growth in exports causes economy-wide productivity gains which amounts to enhanced gross domestic product.

In addition, exports can also be linked to sustainable economic growth through the balance of payments. The constraints on the balance of payments arise when a country's level of imports exceeds that of exports. In such a situation, the deficit can only be financed either through government borrowing or use of the country's reserves (Kok and Ersoy, 2009; Gupta and Singh, 2016).

### **INTERNATIONAL PRODUCTION THEORY**

This economic theory states that the tendency of firms to invest overseas is dependent on a cost – benefit analysis of particular factors in both its home country and the host country. This theory explicitly states that the decision to invest in a country is dependent not only on the anticipated returns but could also on country specific factors like barriers to entry, political stability, cost of capital and production, economies of scale and demand for products (Eboh, 2011; Ibrahim and Omoniyi, 2011; Ajayi and Oke, 2012; Muhammed, Azu and Oko, 2018).

According to Dwivedi (2009), firms may invest in countries where labour and raw materials are comparatively cheaper in order to minimize costs. This partly explains the movement of foreign direct investment to Asia; specifically, China and India where the cost of labour is relatively cheaper than the rest of the world.

### **ENDOGENOUS GROWTH THEORIES**

The emergence of "endogenous growth" theories emphasized the importance of human capital accumulation and technological externalities in development processes. In this respect, MNCs which rely on the most advanced production and organization methods are



seen as powerful vehicles of technology transfer to less developed economies. In this regard, the classical paper of Findlay, 1978 as cited in Dwivedi (2009) represents a first formal example of the potential link between FDI and technology transfer while the models of the “new growth theory” provides a very useful tool to analyze how the introduction of new inputs and technologies influence the production function of a given economy and how externalities affect the research efforts of the economic agents and the diffusion of knowledge. Hence, endogenous growth theory constitutes the predominant theoretical framework within which recent research, studies the impact of FDI on growth (Erhieyovwe & Onovwoakpoma, 2013, Uwakaeme, 2015).

The agreement between the academic world and international organizations that FDI plays positive roles in the development and growth process makes many developing countries to design policies that attract foreign investments from industrialized countries. This notwithstanding, Saini and Singhania (2016) in their study about FDI and growth in developing economies noted that FDI being deemed to be a catalyst for output growth, capital accumulation and technological progress is a less controversial hypothesis in theory than in practice.

The “development threshold hypothesis” is clearly related to the notion of absorption capacity under which recipient economies can take advantage of the potential positive externalities that is associated with the presence of FDI provided that the technology gap is not too large. Otherwise, FDI can represent “technological enclaves in the host country, characterized by significant productivity and plant size differentials and limited productivity spill overs” (Gupta and Singh, 2016).

## **RESEARCH DESIGN**

According to Creswell and Creswell (2018) a research design refers to the approaches, techniques, procedures, framework or plans of carrying out research studies. It is used as a guide in collecting and analysing data; and also aimed at identifying variables and their relationship to one another (Flick, 2015). In a nutshell, the research design is used for the purpose of obtaining data to enable the researcher answer research questions and test hypotheses.

This research is an empirical analysis of the relationship between foreign direct investment vis-a-vis economic growth and development of Nigeria. The researchers employed the analytical and ex-post facto research design. It is advantageous for assessing historical data which may be qualitative or quantitative in nature (Creswell and Creswell, 2018). This study relied on historical economic data that bear the common features of an ex-post facto research. It aimed at determining, establishing and/or measuring the relationship between one variable and another or the impact of one variable on another in which the variables involved are not manipulated by the researcher. The importance of ex-post facto research is that it is a realistic approach in solving business and socio-economic problems, which involves gathering of records of past events, analyzing the records and using the outcome of the analysis to predict future events (Creswell, 2012; Bryman and Bell, 2015; Flick, 2015).

## **SOURCES OF DATA COLLECTION**

The issue of data is at the centre of research, and the nature of any study depends entirely on the objectives of the research and the type of research undertaken (Bryman and Bell, 2015). Consistent with the above and in line with previous researches conducted in the area of economics and financial management this research is basically based on secondary data and time series analysis. Secondary data are data which have been processed, collated and exist in published form (Creswell, 2012; Bryman and Bell, 2015). The relevant Secondary data

sources for this study are the Central Bank of Nigeria Statistical Bulletin, World Bank Annual Reports and Publications from United Nations Conference on Trade and Development. For practical purposes and to achieve the stated objectives of the study, annual time series data and cross-sectional data of the variables were used.

### **DATA ANALYSIS TECHNIQUE**

In analyzing the data, the statistical tool adopted is regression technique which is being used to determine the impact and relationship between the dependent variables and the independent variables with a view to minimizing the error term. The statistical tool adopted for this study is based on the apriori expectation that there is significant relationship between foreign direct investment and economic development. In addition, it is believed that the linear regression is capable of measuring the degree of relationship between the dependent and independent variables, estimate the numerical co-efficient, test the long-run equilibrium relationships and at the same time explain the extent to which they affect each other (Bryman and Bell, 2015; Creswell & Creswell, 2018).

In a similar vein, another reason for using this analytical technique is based on the fact that the regression analysis is assumed to be the best linear unbiased estimator and it has minimum variance (Dwivedi, 2009; Gujarati & Porter, 2009; Bryman and Bell, 2015).

Hence:

$$Y = F(X)$$

$$Y = A_0 + A_1X + U_t$$

Where:

Y = Dependent/response variable

X = Independent/explanatory variable

F = Functional notation

A<sub>0</sub> = Intercept of the dependent variable, Y

A<sub>1</sub> = Parameter and coefficient of the independent variable, X

T = Time periods of the variable under study

U = Error term/stochastic variables which serve as a surrogate for all variables omitted from the model but which collectively affect the dependent variable.

### **MODEL SPECIFICATION**

A model is a simplified view of reality designed to enable a researcher describe the essence and inter-relationship within the phenomenon it depicts (Flick, 2015). The model specification conforms to the theoretical expositions of the various schools of thought analyzed in the literature review. Models that specify the relationship between foreign direct investment inflows and economic development are in the works of Oloyede & Obamuyi (2000), Zhang (2001), Saggi (2002), and Zhang (2017); they found that FDI has a significant impact on economic growth and development in the host country.

In order to evaluate the effect of FDI on Nigeria's economic development, the underlisted economic development indicators are used as proxies for economic development: gross domestic product per capita (GDPPC) and human development index (HDI). On the other hand, FDIs in six (6) sectors are adopted namely; FDI in Mining and Quarrying Sector (FDIMQ), FDI in Manufacturing and Processing Sector (FDIMP), FDI in Agricultural Sector (FDIAG), FDI in Transport and Communication Sector (FDITC), FDI in Building and Construction Sector (FDIBC), FDI in Trading and Business (FDITB).

GDPPC = Gross Domestic Product Per Capita.

HDI = Human Development Index

FDIMQ = Foreign Direct Investment in Mining and Quarrying Sector.

FDIMP = Foreign Direct Investment in Manufacturing and Processing Sector.

FDIAG = Foreign Direct Investment in Agricultural Sector.  
FDITC = Foreign Direct Investment in Transport and Communication.  
FDIBC = Foreign Direct Investment in Building and Construction.  
FDITB = Foreign Direct Investment in Trading and Business

Thus,

Model 1:  $GDPPC = F(FDIMQ, FDIMP, FDIAG, FDITC, FDIBC, FDITB)$

In order to express the effect of the random term “ $U_t$ ” in a parametric form, the equation is stated as follows:

$$GDPPC_t = A_0 + A_1 FDIMQ_t + A_2 FDIMP_t + A_3 FDIAG_t + A_4 FDITC_t + A_5 FDIBC_t + A_6 FDITB_t + U_t \dots \dots \dots 3.1$$

To enhance the estimated model using the Ordinary Least Squares (OLS), model

3.1 is transformed into log-linear as follows:

$$\ln GDPPC_t = A_0 + A_1 \ln FDIMQ_t + A_2 \ln FDIMP_t + A_3 \ln FDIAG_t + A_4 \ln FDITC_t + A_5 \ln FDIBC_t + A_6 \ln FDITB_t + U_t \dots \dots \dots 3.2$$

Model 2:  $HDI = F(FDIMQ, FDIMP, FDIAG, FDITC, FDIBC, FDITB)$

Similarly;

$$HDI_t = A_0 + A_1 FDIMQ_t + A_2 FDIMP_t + A_3 FDIAG_t + A_4 FDITC_t + A_5 FDIBC_t + A_6 FDITB_t + U_t \dots \dots \dots 3.3$$

Thus:

$$\ln HDI_t = A_0 + A_1 \ln FDIMQ_t + A_2 \ln FDIMP_t + A_3 \ln FDIAG_t + A_4 \ln FDITC_t + A_5 \ln FDIBC_t + A_6 \ln FDITB_t + U_t \dots \dots \dots 3.4$$

Where;

GDPPC = the dependent variable in model 1

HDI = the dependent variable in model 2

FDIMQ = one of the independent variables in both models

FDIMP = one of the independent variables in both models

FDIAG = one of the independent variables in both models

FDITC = one of the independent variables in both models

FDIBC = one of the independent variables in both models

FDITB = one of the independent variables in both models

ln = Natural logarithms

$A_0$  = Intercept of the response variables, GDPPC & HDI

$A_1 - A_6$  = Parameters/co-efficients of the respective independent variables

T = Time periods of the variables under study

U = Error/stochastic term.

Ceteris paribus, the theoretical *a priori* expectation is:  $A_1 > 0, A_2 > 0, A_3 > 0, A_4 > 0, A_5 > 0, A_6 > 0$ .

## METHOD OF DATA ANALYSIS

The hypotheses developed were analysed using multiple regression technique. Also, 5% (0.05) level of significance or 95% confidence level was chosen for the purpose of this study. In addition, the Eviews software version 7.0 will be used in estimating the models in this study. The models will help to examine the relationship between the independent variables (FDIMQ, FDIMP, FDIAG, FDITC, FDIBC and FDIBT) and dependent variables (GDPPC and HDI)

## STATISTICAL TESTS

### Coefficient of Determination ( $R^2$ )

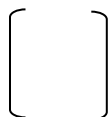
The  $R^2$  is used to determine the explanatory power of the model i.e. the goodness of fit of the regression. Simply put, it measures the proportion of variations in the dependent variable that



is explained by the independent variables. Due to the number of explanatory variables used, the tendency for the value of  $R^2$  to rise is inherent. Therefore, to correct this defect,  $R^2$  is adjusted by taking into account the degree of freedom which decreases as new variables are introduced in the function. The adjusted coefficient of determination is computed thus:

$$\bar{R}^2 = 1 - \frac{n-1}{n-k} (1 - R^2)$$

As already stated, this measures the total variations in the regress and explained by the regressors.



### The Student T-test

This test is used to test the individual significant value of the variables used in the model. The student t-test is carried out to determine if the independent variable contribute to the significance of the linear relationship established.

Decision Rule: If  $t_{cal} < t_{tab}$  at  $\alpha/2$  level of significance and  $n - k - 1$  degree of freedom; accept  $H_0$  and reject  $H_A$ . If  $t_{cal} > t_{tab}$  at  $\alpha/2$  level of significance and  $n - k - 1$  degree of freedom; reject  $H_0$  and conclude that the variable is significant.

Alternatively: If the significant level (prob.) is less than 0.05, reject  $H_0$ , otherwise do not reject.

### The F test

This test measures the overall level of significance of the variables used in the model. It shows the overall soundness of the model and its parameter estimates. If the statistical f-value exceeds the critical value, we reject the null hypothesis that the true slope coefficients are simultaneously equal to zero. Alternatively, if the significant level (prob.) as shown in the regression result is less than 0.05, reject  $H_0$  and vice versa.

## ECONOMETRIC TESTS

### Test for Stationarity

Generally, most time series data are not stationary at level form and as a result, leads to the problem of spurious regression. A time series is stationary if its mean and variance are constant over time and the covariance between two time periods depend only on the disturbance or gap or lag between the two time periods and not the actual time at which the covariance is computed. In order to conduct this test, the Augmented Dickey-Fuller (ADF) test will be employed since it adjusts for serial correlation.

The general form is:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{i=1}^m \alpha_i \Delta Y_{t-1} + \varepsilon_t$$

Where  $\Delta$  = difference factor  $m$

$Y_{t-1}$  = Time series, and

$\varepsilon_t$  = pure white noise error term.

This test is conducted under the following null hypothesis:

$H_0: \delta = 0$  i.e. non-stationarity.

To do this, the test will be applied on the parameter  $\delta$  and the resulting value will be compared with critical values developed by Dickey and Fuller.

Decision: If the statistical value exceeds the critical value, we reject the null hypothesis of non-stationarity.

### Co-integration Test

Co-integration test is used to show whether the linear combination of non-stationary time series is stationary. That is, although the time series is integrated of say order one  $I(1)$ , its

linear combination can be  $I(0)$ . From the viewpoint of economics, two variables will be co-integrated if they have a long term, or equilibrium relationship between them (Creswell, 2018). To test for this, the Engle-Granger (EG) or Augmented Engle-Granger (AEG) test would be employed. To carry out this test, we will follow this procedure:

- Estimate equation and obtain the value of the residuals.
- Perform a unit root test on the residuals using ADF test.

Decision Rule: Reject  $H_0$  (no co-integration) if the statistical value of the result exceeds the critical value at 5% level of significance and conclude that the variables included in equation have long run relationship, otherwise do not reject  $H_0$ .

### Autocorrelation Test

This test is used to verify the randomness of the error term between members of the same series of observations. Put differently, it is used to test for serial correlation of the errors corresponding to different observations. The Durbin-Watson d test will be employed to conduct this test. The Durbin-Watson statistic is computed as:

$$D = \frac{\sum_{t=2}^{t=n} (\mu_t - \mu_{t-1})^2}{\sum_{t=1}^{t=n} \mu_t^2}$$

If the D value is about 2, there is no serial correlation (of the first order) either positive or negative. But the closer d is to zero (0) the greater the evidence of positive correlation and the closer d is to 4 the greater the evidence of negative serial correlation

## DATA PRESENTATION, ANALYSIS & HPOTHESES TESTING

### DATA PRESENTATION

**Table 1.1: Data of Foreign Direct Investment and Economic Development Indicators 1984 - 2018.**

YEAR	GDPPC (\$ US)	HDI	FDIMQ (N'Billion)	FDIMP (N'Billion)	FDIAG (N'Billion)	FDITC (N'Billion)	FDIBC (N'Billion)	FDITB (N'Billion)
1984	3.42	-0.46	2.64	3.50	2.02	2.07	2.41	3.32
1985	3.41	-0.46	2.69	3.58	2.03	2.09	2.43	3.39
1986	3.39	-0.44	2.71	3.60	2.04	2.11	2.47	3.46
1987	2.81	-0.43	2.75	3.66	2.04	2.12	2.51	3.49
1988	2.95	-0.43	2.77	3.71	2.05	2.14	2.55	3.54
1989	2.94	-0.42	2.80	3.73	2.13	2.20	2.68	3.54
1990	2.95	-0.41	3.04	3.80	2.52	2.38	2.87	3.23
1991	2.79	-0.41	2.91	3.94	2.58	2.57	3.17	3.16
1992	2.71	-0.41	3.81	3.99	2.59	2.59	3.15	3.17
1993	2.75	-0.40	4.44	4.14	3.08	2.63	1.85	3.27
1994	2.79	-0.40	4.43	4.15	3.08	2.63	3.23	3.35
1995	2.92	-0.39	4.75	4.44	3.08	2.57	3.19	3.48
1996	3.22	-0.39	4.75	4.47	3.08	2.69	3.27	3.56
1997	3.28	-0.38	4.77	4.50	3.08	2.83	3.10	3.56
1998	3.30	-0.38	4.78	4.54	3.08	2.84	3.59	4.02
1999	2.69	-0.38	4.77	4.56	3.08	2.91	3.60	4.04
2000	3.14	-0.37	4.78	4.57	3.08	2.91	3.60	4.05
2001	2.76	-0.37	4.79	4.58	3.08	2.98	3.62	4.08
2002	2.78	-0.36	4.79	4.60	3.08	3.24	3.63	4.09
2003	2.81	-0.36	4.79	4.66	3.08	3.46	3.66	4.16
2004	2.89	-0.34	4.79	5.01	3.08	3.63	3.72	4.31
2005	3.04	-0.33	4.91	5.13	3.08	3.75	3.83	4.42
2006	3.18	-0.32	5.02	5.33	3.08	3.92	4.02	4.62
2007	3.27	-0.32	5.12	5.34	3.12	4.03	4.68	4.68
2008	3.35	-0.31	5.15	5.36	3.15	4.06	4.10	4.70
2009	3.30	-0.31	5.16	5.38	3.15	4.08	4.13	4.69

2010	3.26	-0.32	5.18	5.42	3.16	4.09	4.19	4.67
2011	3.36	-0.31	5.21	5.45	3.16	4.10	4.37	4.68
2012	3.44	-0.30	5.22	5.48	3.17	4.10	4.43	4.70
2013	3.43	-0.28	5.23	5.51	3.17	4.11	4.47	4.71
2014	3.51	-0.28	5.23	5.54	3.17	4.11	4.50	4.73
2015	3.40	-0.28	5.24	5.56	3.18	4.11	4.54	4.70
2016	3.33	-0.28	5.25	5.58	3.18	4.12	4.37	4.71
2017	3.29	-0.28	5.25	5.60	3.18	4.12	4.46	4.73
2018	3.33	-0.28	5.26	5.60	3.18	4.13	4.47	4.73

**Source:** Central Bank of Nigeria Statistical Bulletin and World Bank Development Indicators,

**Table 1.2: Data of Foreign Direct Investment and Economic Development Indicators in Logarithm Form**

YEAR	lnGDPPC	lnHDI	lnFDIMQ	lnFDIMP	lnFDIAG	lnFDITC	lnFDIBC	lnFDITB
1984	3.42	-0.46	2.64	3.50	2.02	2.07	2.41	3.32
1985	3.41	-0.46	2.69	3.58	2.03	2.09	2.43	3.39
1986	3.39	-0.44	2.71	3.60	2.04	2.11	2.47	3.46
1987	2.81	-0.43	2.75	3.66	2.04	2.12	2.51	3.49
1988	2.95	-0.43	2.77	3.71	2.05	2.14	2.55	3.54
1989	2.94	-0.42	2.80	3.73	2.13	2.20	2.68	3.54
1990	2.95	-0.41	3.04	3.80	2.52	2.38	2.87	3.23
1991	2.79	-0.41	2.91	3.94	2.58	2.57	3.17	3.16
1992	2.71	-0.41	3.81	3.99	2.59	2.59	3.15	3.17
1993	2.75	-0.40	4.44	4.14	3.08	2.63	1.85	3.27
1994	2.79	-0.40	4.43	4.15	3.08	2.63	3.23	3.35
1995	2.92	-0.39	4.75	4.44	3.08	2.57	3.19	3.48
1996	3.22	-0.39	4.75	4.47	3.08	2.69	3.27	3.56
1997	3.28	-0.38	4.77	4.50	3.08	2.83	3.10	3.56
1998	3.30	-0.38	4.78	4.54	3.08	2.84	3.59	4.02
1999	2.69	-0.38	4.77	4.56	3.08	2.91	3.60	4.04
2000	3.14	-0.37	4.78	4.57	3.08	2.91	3.60	4.05
2001	2.76	-0.37	4.79	4.58	3.08	2.98	3.62	4.08
2002	2.78	-0.36	4.79	4.60	3.08	3.24	3.63	4.09
2003	2.81	-0.36	4.79	4.66	3.08	3.46	3.66	4.16
2004	2.89	-0.34	4.79	5.01	3.08	3.63	3.72	4.31
2005	3.04	-0.33	4.91	5.13	3.08	3.75	3.83	4.42
2006	3.18	-0.32	5.02	5.33	3.08	3.92	4.02	4.62
2007	3.27	-0.32	5.12	5.34	3.12	4.03	4.68	4.68
2008	3.35	-0.31	5.15	5.36	3.15	4.06	4.10	4.70
2009	3.30	-0.31	5.16	5.38	3.15	4.08	4.13	4.69
2010	3.26	-0.32	5.18	5.42	3.16	4.09	4.19	4.67
2011	3.36	-0.31	5.21	5.45	3.16	4.10	4.37	4.68
2012	3.44	-0.30	5.22	5.48	3.17	4.10	4.43	4.70
2013	3.43	-0.28	5.23	5.51	3.17	4.11	4.47	4.71
2014	3.51	-0.28	5.23	5.54	3.17	4.11	4.50	4.73

2015	3.40	-0.28	5.24	5.56	3.18	4.11	4.54	4.70
2016	3.33	-0.28	5.25	5.58	3.18	4.12	4.37	4.71
2017	3.29	-0.28	5.25	5.60	3.18	4.12	4.46	4.73
2018	3.33	-0.28	5.26	5.60	3.18	4.13	4.47	4.73

**Source:** Author's Computation from table 1.1

Tables 1.1 and 1.2 contain:

- Data for thirty-five years (35years) 1984 – 2018.
- Dependent Variables (GDPPC and HDI).
- Independent Variables (FDIMQ, FDIMP, FDIAG, FDITC, FDIBC and FDITC)

Where:

GDPPC = Gross Domestic Product Per Capita.

HDI = Human Development Index

FDIMQ = Foreign Direct Investment in Mining and Quarrying Sector.

FDIMP = Foreign Direct Investment in Manufacturing and Processing Sector.

FDIAG = Foreign Direct Investment in Agricultural Sector.

FDITC = Foreign Direct Investment in Transport and Communication.

FDIBC = Foreign Direct Investment in Building and Construction.

FDITB = Foreign Direct Investment in Trading and Business.

## DATA ANALYSIS AND RESULTS INTERPRETATION,

This shows the analysis of variables used in the equations and their corresponding coefficients as estimated by the Eview software.

### Result of Stationarity Test

**Table 1.3: Stationarity Test Result**

Variables	ADF Value	Critical Value	Order of Integration
GDPPC	-7.665648	1% = -3.646342 5% = -2.954021 10% = -2.615817	Stationary at first difference I(1)
HDI	-4.974581	1% = -2.634731 5% = -1.951000 10% = -1.610907	Stationary at level I(0)
FDIMQ	-3.737973	1% = -3.670170 5% = -2.963972 10% = -2.621007	Stationary at second difference I(2)
FDIMP	-5.162478	1% = -3.646342 5% = -2.954021 10% = -2.615817	Stationary at first difference I(1)
FDIAG	-5.325793	1% = -3.646342 5% = -2.954021 10% = -2.615817	Stationary at first difference I(1)
FDITC	-5.562440	1% = -3.661661 5% = -2.960411 10% = -2.619160	Stationary at second difference I(2)
FDIBC	-5.586953	1% = -4.252879 5% = -3.548490	Stationary at level I(0)

		10% = -3.207094	
FDITB	-4.635223	1% = -3.646342 5% = -2.954021 10% = -2.615817	Stationary at first difference I(1)

**Source:** Extracts from Result of Stationarity Test

The result in table 1.3 above shows that two variables (HDI and FDIBC) are stationary at level, four variables (GDPPC, FDIMP, FDIAG and FDITB) are stationary at first difference while the remaining two variables (FDIMQ and FDITC) are stationary at second difference by comparing the observed values (in absolute terms) of the ADF test statistics at 5% levels significance. This is so because the Augmented Dickey-Fuller test statistic is greater than the Mackinnon critical value at 5% level of significance. Therefore, the variables are stationary.

### Result for Co-integration Test

After the stationarity test on the variables, the co-integration test was carried out among the variables. When co-integration is present, it means that foreign direct investment and economic development indicators share a common trend and long-run equilibrium. The long run relationship was established by conducting the co-integration test using the Johansen co-integration approach. It involves generating the residuals from the regression and then performing stationarity test on it.

Hypothesis to be tested is:  $H_0$ : the variables are not co-integrated

$H_1$ : the variables are co-integrated

Decision Rule: Reject  $H_0$  if the absolute value of ADF of the residual exceeds the critical value at 5% level, otherwise do not reject.

### The Co-integration Results of Foreign Direct Investment (FDI) and Gross Domestic Product per capita (GDPPC)

**Table 1.4: Co-integrating Test Result of Foreign Direct Investment (FDI) and Gross Domestic Product per capita (GDPPC) (Johansen Cointegration Method)**

Hypothesized		Trace	0.05	Hypothesized		Max-Eigen	0.05
No. of CE(s)	Eigen value	Statistic	Critical Value	No. of CE(s)	Eigen value	Statistic	Critical Value
None *	0.958588	232.4555	125.6154	None *	0.958588	105.0785	46.23142
At most 1 *	0.739684	127.3770	95.75366	At most 1 *	0.739684	44.41336	40.07757
At most 2 *	0.566645	82.96363	69.81889	At most 2	0.566645	27.59453	33.87687
At most 3 *	0.460803	55.36910	47.85613	At most 3	0.460803	20.38325	27.58434
At most 4 *	0.398456	34.98585	29.79707	At most 4	0.398456	16.77242	21.13162
At most 5 *	0.265418	18.21344	15.49471	At most 5	0.265418	10.17897	14.26460
At most 6 *	0.216096	8.034465	3.841466	At most 6 *	0.216096	8.034465	3.841466

**Source:** Eview Extract version 10

\* denotes rejection of the hypothesis at 5% (1%) significance level.

Trace test indicates 7 cointegrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

Source: Extract from Cointegration Test Result (Appendix)

From Table 1.3, the null hypothesis of no co-integration, for  $r=0$  (None),  $r \leq 1$  (at most 1),  $r \leq 2$  (at most 2),  $r \leq 3$  (at most 3),  $r \leq 4$  (at most 4),  $r \leq 5$  (at most 5) and  $r \leq 6$  (at most 6) were rejected in the trace statistic. The statistical values of these tests are greater than their critical values implying that there are at least seven (7) co-integrating vectors among the series.



$r = 0$  (None),  $r \leq 1$  (at most 1) and  $r \leq 6$  (at most 6) are rejected in the max-eigen statistic. The statistical values of this test are greater than the critical values implying that there are at least three (3) co-integrating vectors among the series.

The implication of this result is that there is the possibility that a positive long run relationship exists between the independent variables and the dependent variable (GDPPC).

### The Co-integration Results of Foreign Direct Investment (FDI) and Human Development Index (HDI)

**Table 1.5: Co-integrating Test Result of Foreign Direct Investment (FDI) and Human Development Index (HDI) (Johansen Cointegration Method)**

Hypothesized		Trace	0.05	Hypothesized		Max-Eigen	0.05
No. of CE(s)	Eigenvalue	Statistic	Critical Value	No. of CE(s)	Eigenvalue	Statistic	Critical Value
None *	0.965396	222.1533	125.6154	None *	0.965396	111.0046	46.23142
At most 1 *	0.708154	111.1487	95.75366	At most 1 *	0.708154	40.64048	40.07757
At most 2 *	0.572361	70.50822	69.81889	At most 2	0.572361	28.03267	33.87687
At most 3	0.403132	42.47555	47.85613	At most 3	0.403132	17.02998	27.58434
At most 4	0.296028	25.44558	29.79707	At most 4	0.296028	11.58356	21.13162
At most 5	0.260003	13.86201	15.49471	At most 5	0.260003	9.936584	14.26460
At most 6 *	0.112150	3.925429	3.841466	At most 6 *	0.112150	3.925429	3.841466

Source: Eview Extract Version 10

\* denotes rejection of the hypothesis at 5% (1%) significance level.

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level

Max-eigenvalue test indicates 3 cointegrating eqn(s) at the 0.05 level

Source: Extract from Cointegration Test Result (Appendix)

From Table 1.5, the null hypothesis of no co-integration, for  $r=0$  (None),  $r \leq 1$  (at most 1),  $r \leq 2$  (at most 2) and  $r \leq 6$  (at most 6) are rejected in the trace statistic and max-eigen statistic. The statistical values of these tests are greater than their critical values implying that there are at least four (4) co-integrating vectors among the series.

$r=0$  (None),  $r \leq 1$  (at most 1) and  $r \leq 6$  (at most 6) are rejected in the max-eigen statistic. The statistical values of this test are greater than the critical values implying that there are at least three (3) co-integrating vectors among the series.

The implication of these results is that there is the possibility that a positive long run relationship exists between the independent variables and the dependent variable (HDI).

#### Autocorrelation (Serial Correlation)

The Durbin Watson d-test was adopted to further test the model. According to Creswell and Creswell (2018) if the d value is about 2, there is no serial correlation (of the first order) either positive or negative. But the closer d is to zero (0) the greater the evidence of positive correlation; the closer d is to 4 the greater the evidence of negative serial correlation.

The Durbin Watson statistic (DW) = 1.41 and 1.85, (tables 1.6 and 1.7 below) indicate a case of no autocorrelation (serial correlation) in the two models.

#### Presentation and Interpretation of Regression Results

In this study, econometric relationships between the variables were established. Available data on foreign direct investment, gross domestic product per capita and human development index were collated and used for the purpose of this analysis. Two multiple regression models were developed to capture the assumed relationship between these variables.

**Table 1.6 Presentation of Model 1 Result (GDPPC)**

Dependent Variable: GDPPC

Method: Least Squares

Date: 05/23/20 Time: 14:08

Sample: 1984 2018

Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.434278	1.120160	2.173152	0.0384
FDIMQ	0.149112	0.268459	0.555436	0.5830
FDIMP	0.952897	0.442597	2.152969	0.0401
FDIAG	-0.923368	0.495780	-1.862455	0.0731
FDITC	-0.385488	0.314417	-1.22604	0.2304
FDIBC	-0.014424	0.142375	-0.101309	0.9200
FDITB	-0.119420	0.280780	-0.425314	0.6739
R-squared	0.508017	Mean dependent var		3.119812
Adjusted R-squared	0.402593	S.D. dependent var		0.263959
S.E. of regression	0.204020	Akaike info criterion		-0.164342
Sum squared resid	1.165475	Schwarz criterion		0.146727
Log likelihood	9.875989	Hannan-Quinn criter.		-0.056961
F-statistic	4.818764	Durbin-Watson stat		1.410181
Prob(F-statistic)	0.001714			

$$GDPPC = 2.434 + 0.149 * FDIMQ + 0.953 * FDIMP - 0.923 * FDIAG - 0.385 * FDITC - 0.014 * FDIBC - 0.119 * FDITB$$

The result obtained from the regression of model is presented in table 4.9. From the above result, the relationship of the model is:

$$GDPPC = 2.434 + 0.149 * FDIMQ + 0.953 * FDIMP - 0.923 * FDIAG - 0.385 * FDITC - 0.014 * FDIBC - 0.119 * FDITB \dots \dots \dots 4.1$$

GDPPC = Gross Domestic Product per capita

HDI = Human Development Index

FDIMQ = Foreign Direct Investment in Mining and Quarrying Sector.

FDIMP = Foreign Direct Investment in Manufacturing and Processing Sector.

FDIAG = Foreign Direct Investment in Agricultural Sector.

FDITC = Foreign Direct Investment in Transport and Communication.

FDIBC = Foreign Direct Investment in Building and Construction.

FDITB = Foreign Direct Investment in Trading and Business

The result indicates that Foreign Direct Investment in Agricultural Sector (FDIAG), Foreign Direct Investment in Transport and Communication (FDITC), Foreign Direct Investment in

Building and Construction (FDIBC) and Foreign Direct Investment in Trading and Business (FDITB) have negative relationship with the dependent variable, Gross Domestic Product per capita (GDPPC). The negative coefficients of 0.923,0.385, 0.014 and 0.119 indicate that Gross Domestic Product per capita (GDPPC) will decrease by 0.923,0.385, 0.014 and 0.119 units respectively if Foreign Direct Investment in Agricultural Sector (FDIAG), Foreign Direct Investment in Transport and Communication (FDITC), Foreign Direct Investment in Building and Construction (FDIBC) and Foreign Direct Investment in Trading and Business (FDITB) is increased by 1 unit, ceteris paribus. However, Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ) and Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) have positive relationship with the dependent variable Gross Domestic Product per capita (GDPPC). Thus, the positive coefficients of 0.149 and 0.953 indicate that Gross Domestic Product per capita (GDPPC) will increase by 0.149 and 0.953 units respectively if Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ) and Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) increase by 1 unit, ceteris paribus. The coefficients of these two variables (FDIMQ and FDIMP) are positively signed and appear to have met the a priori expectation and have exerted a positive effect on GDPPC while the coefficients of (FDIAG, FDITC, FDIBC and FDITB) are negatively signed in contrary to the a priori expectation.

**Table 1.7 Presentation of Model 2 Result (Human Development Index)**

Dependent Variable: HDI

Method: Least Squares

Date: 05/23/20 Time: 14:10

Sample: 1984 2018

Included observations: 35

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.763237	0.049644	-15.37426	0.0000
FDIMQ	-0.021582	0.011898	-1.813982	0.0804
FDIMP	0.092203	0.019615	4.700577	0.0001
FDIAG	0.026917	0.021972	1.225030	0.2308
FDITC	-0.001688	0.013934	-0.121139	0.9044
FDIBC	0.001967	0.006310	0.311795	0.7575
FDITB	-0.002627	0.012444	-0.211129	0.8343
R-squared	0.979070	Mean dependent var	-0.358162	
Adjusted R-squared	0.974586	S.D. dependent var	0.056718	
S.E. of regression	0.009042	Akaike info criterion	-6.397049	
Sum squared resid	0.002289	Schwarz criterion	-6.085980	
Log likelihood	118.9484	Hannan-Quinn criter.	-6.289668	
F-statistic	218.3041	Durbin-Watson stat	1.848752	
Prob(F-statistic)	0.000000			

Source: Eview Extract Version 10

$HDI = -0.763 - 0.022 * FDIMQ + 0.092 * FDIMP + 0.027 * FDIAG - 0.002 * FDITC + 0.002 * FDIBC - 0.003 * FDITB$

From the computed result above, the relationship of the model is:

$HDI = -0.763 - 0.022 * FDIMQ + 0.092 * FDIMP + 0.027 * FDIAG - 0.002 * FDITC + 0.002 * FDIBC - 0.003 * FDITB \dots\dots\dots 4.2$

The result above shows that Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ), Foreign Direct Investment in Transport and Communication (FDITC) and Foreign Direct Investment in Trading and Business (FDITB) have negative relationship with the dependent variable, Human Development Index (HDI). The negative coefficients of 0.022, 0.002 and 0.003 indicate that Human Development Index (HDI) will reduce by 0.022, 0.002 and 0.003 units respectively if Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ), Foreign Direct Investment in Transport and Communication (FDITC) and Foreign Direct Investment in Trading and Business (FDITB) increase by 1 unit, ceteris paribus. However, Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP), Foreign Direct Investment in Agricultural Sector (FDIAG) and Foreign Direct Investment in Building and Construction (FDIBC) have positive relationship with the dependent variable Human Development Index (HDI). The positive coefficients of 0.092, 0.027 and 0.002 indicate that Human Development Index (HDI) will increase by 0.092, 0.027 and 0.002 units respectively if Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP), Foreign Direct Investment in Agricultural Sector (FDIAG) and Foreign Direct Investment in Building and Construction (FDIBC) increase by 1 unit, ceteris paribus. The coefficients of these three variables (FDIMP, FDIAG and FDIBC) are positively signed in support of the a priori expectation while the coefficients of (FDIMQ, FDITC and FDITB) are negatively signed and appear not to have met the a priori expectation.

**Table 1.8 Results of t-test, F-test and R<sup>2</sup>**

Global Statistics	Dependent Variables	
	Model 1	Model 2
	GDPPC	HDI
R-square	0.5080	0.9791
Adjusted R-square	0.4026	0.9746
F-statistics	4.8188	218.304
Prob(F-statistic)	0.0017	0.0000

**Source:** Regression Results (tables 1.6 and 1.7)

### F-test

This test is used to determine the overall significance of the model. It follows the f-distribution with degree of freedoms  $k$  ( $v_1$ ) and  $n-k-1$  ( $v_2$ ).

Where  $k$  = Number of independent variables, and  $n$  = Number of observations.

Hypothesis to be tested is

$H_0: \beta_1 = 0$  (the model is statistically insignificant)

$H_A: \beta_1 \neq 0$  (the model is statistically significant)

At  $\alpha = 5\%$

### Decision Rule:

Reject  $H_0$  if  $F_{cal} > F_{0.05}(v_1, v_2)$ , otherwise do not reject.

The overall model is measured by the F-statistic test. Considering the result of the two models (GDPPC and HDI) in table 1.8, the F-Statistic values of 4.819 and 218.304 at  $p$ -values of 0.0017 and 0.0000 respectively indicate that the models are statistically significant because the  $p$ -values are less than (0.05) the 5% level of significance. Hence,  $H_0$  is rejected and it can be concluded that the explanatory variables are statistically significant in explaining variations in Gross Domestic Product per capita and Human Development Index.

### Coefficient of Determination (R<sup>2</sup>)

Considering the result in table 1.8 above, under GDPPC, the coefficient of correlation,  $R^2$  value of 0.508 indicates that the power of our model in explaining variations in relation to dependent variable, GDPPC is not strong. In the same vein, it implies that the relationship between the explained variable and the explanatory variables is not significantly strong. Furthermore, the adjusted coefficient of variation,  $R^2$  value of 0.508 depicts that the variables included in the model explained about 50.8% of the changes in the dependent variable, GDPPC while 49.2% is explained by other factors not included in the model. However, the adjusted coefficient of determination (Adjusted  $R^2$ ), 0.403 indicates that the explanatory variables (FDI) in the model explained about 40.3% of the total variation or changes in the dependent variable, GDPPC while the remaining 59.7% is accounted for by other factors unexplained by the model after talking cognizance of the degrees of freedom.

Moreover, the result in table 1.8 above, under HDI, the  $R^2$  value of 0.979 indicates that the power of our model in explaining variations in relation to dependent variable, HDI is very strong. It also shows that the level of correlation is high. The  $R^2$  value of 0.979 implies that the independent variables (FDI) included in the model explained about 97.9% of the changes in the dependent variable, HDI while 2.1% is explained by other factors outside the model. However, the adjusted coefficient of determination (Adjusted  $R^2$ ), 0.975 indicates that the exogenous variables in the model explained about 97.5% of the total variation or changes in HDI while the remaining 2.5% variation is accounted for by other factors unexplained by the model after talking cognizance of the degrees of freedom.

### The student t-test

Hypothesis to be tested are:

$H_0$ : the parameters estimated are statistically insignificant.

$H_A$ : the parameters estimated are statistically significant.

**Decision Rule:** Reject  $H_0$  if  $|t_{cal}| > |t_{(tab)}|$  at 5% level of significance. Otherwise, do not reject. Alternatively, if the significant level (prob.) as shown in the regression result is less than 0.05, reject  $H_0$  and vice versa.

### Hypotheses Tested

The hypotheses tested here include the following:

**HO<sub>1</sub>:** There is no significant relationship between foreign direct investment in mining/quarrying sector and economic development of Nigeria

**HO<sub>2</sub>:** There is no significant relationship between foreign direct investment in manufacturing/processing sector and economic development of Nigeria

**HO<sub>3</sub>:** There is no significant relationship between foreign direct investment in agricultural sector and economic development of Nigeria.

**HO<sub>4</sub>:** There is no significant relationship between foreign direct investment in transport/communication and economic development of Nigeria.

**HO<sub>5</sub>:** There is no significant relationship between foreign direct investment in building/construction and economic development of Nigeria.

**HO<sub>6</sub>:** There is no significant relationship between foreign direct investment in trading/business and economic development of Nigeria.

**Table 1.9: T-test Result for Model 1 and Model 2.**

Variable	GDPPC t-cal.	GDPPC Prob.	Comments	HDI t- cal	HDI Prob.	Comments
FDIMQ	0.5554	0.5830	Not significant	-1.8140	0.0804	Not significant
FDIMP	2.1530*	0.0401*	Significant	4.7006*	0.0001*	Significant



FDIAG	-1.8625	0.0731	Not significant	1.2250	0.2308	Not significant
FDITC	-1.2260	0.2304	Not significant	-0.1211	0.9044	Not significant
FDIBC	-0.1013	0.9200	Not significant	0.3118	0.7575	Not significant
FDITB	-0.4253	0.6739	Not significant	-0.2111	0.8343	Not significant

**Source: Extract from Tables 1.6 and 1.7.**

### **Test of Hypothesis I**

There is no significant relationship between foreign direct investment in mining/quarrying sector and economic development of Nigeria

GDPPC: t-value = 0.5554; prob. value = 0.5830 > 0.05.

HDI: t-value = -1.8140; prob. value = 0.0804 > 0.05.

Therefore, the null hypothesis is accepted while the alternative hypothesis is rejected.

From the analysis in table 1.9 above, it was found that FDI in mining/quarrying sector has not significantly impacted on GDP per capita and HDI (Economic Development) of Nigeria.

Thus, Foreign Direct Investment in Mining and Quarrying Sector does not significantly enhance Economic Development of Nigeria.

### **Test of Hypothesis II**

There is no significant relationship between foreign direct investment in manufacturing/processing sector and economic development of Nigeria

GDPPC: t-value = 2.1530; prob. value = 0.0401 < 0.05.

HDI: t-value = 4.7006; prob. value = 0.0001 < 0.05.

Therefore, the null hypothesis is rejected while the alternative hypothesis is accepted.

From the analysis in table 1.9 above, it was discovered that FDI in manufacturing and processing sector has significantly impacted on both GDP per capita and HDI (Economic Development) of Nigeria.

Therefore, Foreign Direct Investment in Manufacturing and Processing Sector significantly boosts Economic Development of Nigeria.

### **Test of Hypothesis III**

There is no significant relationship between foreign direct investment in agricultural sector and economic development of Nigeria.

GDPPC: t-value = -1.8625; prob. value = 0.0731 > 0.05.

HDI: t-value = 1.2250; prob. value = 0.2308 > 0.05.

Therefore, the null hypothesis is accepted while the alternative hypothesis is rejected.

From the analysis in table 1.9 above, it was observed that FDI in agricultural sector has not significantly impacted on GDP per capita and HDI (Economic Development) of Nigeria.

It is therefore concluded that Foreign Direct Investment in Agricultural Sector does not significantly strengthen Economic Development of Nigeria.

### **Test of Hypothesis IV**

There is no significant relationship between foreign direct investment in transport/communication and economic development of Nigeria.

GDPPC: t-value = -1.2260; prob. value = 0.2304 > 0.05.

HDI: t-value = -0.1211; prob. value = 0.9044 > 0.05.

Therefore, the null hypothesis is accepted while the alternative hypothesis is rejected.

From the analysis in table 1.9 above, it could be seen that Foreign Direct Investment in Transport and Communication has insignificant impact on both Gross Domestic Product per capita and Human Development Index (Economic Development) of Nigeria.

Hence, Foreign Direct Investment in Transport and Communication is not statistically

significant to Nigeria's Economic Development.

### **Test of Hypothesis V**

There is no significant relationship between foreign direct investment in building/construction and economic development of Nigeria.

GDPPC: t-value = -0.1013; prob. value = 0.9200 > 0.05.

HDI: t-value = 0.3118; prob. value = 0.7575 > 0.05.

Therefore, the null hypothesis is accepted while the alternative hypothesis is rejected.

From the analysis in table 1.9 above, it was revealed that Foreign Direct Investment in Building and Construction has not significantly impacted on Gross Domestic Product per capita and Human Development Index and (Economic Development) of Nigeria.

Consequently, Foreign Direct Investment in Building and Construction Sector does not significantly increase Economic Development of Nigeria.

### **Test of Hypothesis VI**

There is no significant relationship between foreign direct investment in trading/business and economic development of Nigeria.

GDPPC: t-value = -0.4253; prob. value = 0.6739 > 0.05.

HDI: t-value = -0.2111; prob. value = 0.8343 > 0.05.

Therefore, the null hypothesis is accepted while the alternative hypothesis is rejected.

From the analysis in table 1.9 above, it was noticed that Foreign Direct Investment in Trading and Business has no direct significant impact on both Gross Domestic Product per capita and Human Development Index (Economic Development) of Nigeria.

Thus, Foreign Direct Investment in Trading and Business insignificantly enhances Economic Development of Nigeria.

## **DISCUSSION OF RESULTS**

The statistical result in table 1.9 indicates that in model 1, only Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) significantly impacted on Gross Domestic Product per Capita (GDPPC) of Nigeria at 5% level of significance which confirms the work of Imodu (2012) and Oyinola (1995). This means that Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ), Foreign Direct Investment in Agricultural Sector (FDIAG), Foreign Direct Investment in Transport and Communication (FDITC), Foreign Direct Investment in Building and Construction (FDIBC) as well as Foreign Direct Investment in Trading and Business (FDITB) insignificantly explained the variations in the Gross Domestic Product per capita (GDPPC) of Nigeria which negates the result of Ogiogio (1995). Results obtained from model 2 in table 1.9 also show that only Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) significantly impacted on Human Development Index (HDI).

In addition, the coefficients of these variables (FDIMQ and FDIMP) in model 1 (GDPPC) and coefficients of these variables (FDIMP, FDIAG and FDIBC) in model 2 (HDI) were correctly signed in support of the a priori expectation (positive signs). However, all the coefficients of the explanatory variables (FDIAG, FDITC, FDIBC and FDITB) in model 1 (GDPPC) and the coefficients of these variables (FDIMQ, FDITC and FDITB) in model 2 (HDI) were wrongly signed in contrary to the a priori expectation (negative signs).

In addition, considering the result in table 1.8, the  $R^2$  and adjusted  $R^2$  values in the two models used in the study indicate that the power of our independent variables in explaining the variations in relation to the dependent variables respectively are strong. Be that as it may, the relationship between the explanatory variables and the explained variables is much stronger in the HDI model than the GDPPC model

Considering the result of the models in table 1.8, the F-Statistic values revealed that the two models are statistically significant because the  $p$ -values, 0.0017(GDPPC) and 0.0000(HDI) are less than (0.05) the 5% level of significance. Hence,  $H_{0s}$  i.e the null hypotheses were rejected and it could be concluded that the explanatory variables included in the models were jointly significant and therefore could be used in explaining variations in Economic Development of Nigeria, this is also in conformity with the study of Adelegan (2008), Ayanwale (2007) and Egolum (2011) . The Durbin Watson  $d$  statistic indicates a case of no autocorrelation (serial correlation) in the two models (1.41 for GDPPC model and 1.85 for HDI model). Hence, this result did not violate the assumption of non-autocorrelation of the error terms in the ordinary least squares method of regression.

## CONCLUSION

The study shows that only Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) significantly impacted on both Gross Domestic Product per capita (GDPPC) at 5% level of significance and Human Development Index (HDI) at same level of confidence. This reveals that Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) has a significant effect on Economic Development of Nigeria (GDPPC and HDI) for the period under review. However, the coefficients of these variables (FDIMQ and FDIMP) in model 1(GDPPC) and coefficients of these variables (FDIMP, FDIAG and FDIBC) in model 2 (HDI) were correctly signed in support of the a priori expectation (positive signs). All the coefficients of the explanatory variables (FDIAG, FDITC, FDIBC and FDITB) in model 1(GDPPC) and the coefficients of these variables (FDIMQ, FDITC and FDITB) in model 2 (HDI) were wrongly signed in contrary to the a priori expectation (negative signs). The study concludes that Foreign Direct Investment in Manufacturing and Processing Sector enhances Nigeria's Economic Development. Given the above scenario and the fact that Nigeria's economic growth and development requires major investments that can strengthen the Agricultural sector, Manufacturing/Processing sector and other sectors of the economy, the government should focus on foreign investment policies that will be geared towards attracting and encouraging more inflows of foreign capital into these sectors.

FDI can be very effective if it is directed primarily at improving and expanding human capacity building. However, in order to further improve the climate for FDI in Nigeria, the federal government should appreciate and acknowledge the fact that the basic element in any successful development strategy should be to encourage domestic investors first before going after foreign investors, considering the fact that domestic investors constitute the bulk of investment activities in the economy. The GDPPC and HDI models are quite robust, and there is an urgent need for developing economies to take a critical look at their economic policies as regards FDI given the backdrop that FDI could be good or bad for economic development depending on policy formulation and implementation.

## RECOMMENDATIONS

From the findings of the study, the following recommendations are made:

1. Government should encourage more Foreign Direct Investment in Manufacturing and Processing Sector (FDIMP) due to the fact that it had a positive significant impact on Nigerian Economic Development (GDPPC and HDI). Government should ensure that necessary infrastructure and policy framework are made available to guarantee sustainability of the sector.
2. Foreign Direct Investment in Transport/Communication (FDITC) and Foreign Direct Investment in Trading/Business (FDITB) had negative and insignificant impact on Nigerian Economic Development (GDPPC and HDI). This should be looked into by the relevant authority in other to improve their performances.

3. Foreign Direct Investment in Agricultural Sector (FDIAG) and Foreign Direct Investment in Building and Construction (FDIBC) impacted positively on Human Development Index (HDI) but negatively on Gross Domestic Product per Capita (GDPPC) of Nigeria. It should be noted that their effects on Standard of living of Nigerian citizens were relatively low mainly because the resources have not been fully exploited or developed. Thus, government at all levels should strive to support and promote these sectors in order to increase their productivity.
4. Foreign Direct Investment in Mining and Quarrying Sector (FDIMQ) impacted positively on Gross Domestic Product per Capita (GDPPC) but negatively on Human Development Index (HDI) of Nigeria. The Nigerian government should come up with strategies and policies that will improve the output of this sector which in return will further boost the quality of life and standard of living of the citizenry.

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