

Sectoral Foreign Direct Investment and Economic Growth in Nigeria

¹Edobot Udo Ekere, ²Christian Gbarawae Nwikina PhD & ³Kenigheni Good Wilson PhD

^{1&2}Department of Economics, Faculty of Social Sciences, Rivers State University, Nkpulu-Oroworukwo, Rivers State, Nigeria.

³Department of General Studies, Captain ELechi Amadi Polytechnic Rumuola, Port Harcourt, Nigeria.

¹edoekere@yahoo.com ²cgnwikina@gmail.com ³kenigheniwilson@gmail.com

Abstract

This study investigates the effects of sectoral foreign direct investment on economic growth in Nigeria from 1985-2022. The Augmented Dickey Fuller (ADF) and Autoregressive Distributed Lag (ARDL) tests were utilised as the analytical methodologies. The ARDL analysis showed that over a prolonged period, foreign direct investment (FDI) in the agricultural and service sectors has a beneficial impact on economic growth, although this effect is not statistically substantial. FDI in the transport and communications sector has a beneficial and substantial impact on economic progress. Nevertheless, FDI in the industrial sector has a detrimental and substantial impact on economic growth. FDI in agricultural and service sectors had favourable but statistically negligible benefits on economic growth in the near term. FDI in the industrial, transport, and communications sectors had a detrimental and substantial impact on economic growth. Therefore, it was determined that there is a clear correlation between FDI and economic growth in Nigeria. The government should provide a more conducive climate to stimulate an increase in FDIs across different industries. In order to do this, the government should eliminate all barriers to foreign productive investments in Nigeria. The process comprises the resolution of infrastructure deficiencies by tackling matters related to effective government, corruption, and insecurity.

Keywords

FDI in Agriculture,
FDI in
Manufacturing,
FDI in Transport
and
Communications,
Economic Growth.

I. Introduction

The cross-border movement of productive resources is a substantial aspect of the modern world. Substantial volumes of capital are transferred between nations on a daily basis. These movements have a substantial impact on the production of goods and services, job prospects, and the distribution of output across different regions of the globe. Capital flows occur when a citizen of one nation invests in another nation. Investment may manifest in several ways, one of which is foreign direct investment (FDI). Foreign direct investment (FDI) refers to the situation when an investor from one nation (referred to as the home nation) purchases an asset in another nation (known as the host nation) with the purpose of actively managing that asset (Akpakpan, 1999). FDI refers to the purchase of foreign financial assets that leads to a stake of 10 percent or more in ownership. Jenkin and Thomas (2002) argue that FDI is anticipated to enhance economic growth by not just supplying foreign cash but also by stimulating extra local investment. By fostering both connections to suppliers and customers within the local economy, new jobs are indirectly generated and further economic growth is fostered.

Adegbite and Ayadi (2010) argue that FDI plays a crucial role in addressing the shortfall in domestic income generation in emerging economies. This is because governments of most developing nations struggle to produce enough money to cover their expenses. Additional

advantages of FDI, as highlighted by Obayori et al. (2016), comprise the generation of positive externalities and the assimilation of foreign technology. Externalities in this context may manifest as license agreements, copying of foreign enterprises' practices, staff training, and the implementation of new procedures. FDI is often required in key sectors i.e. agriculture, industry, transport, and communication (UNDP, 2006). Substantially, there is a need to improve the aforementioned areas are of utmost importance, especially considering the unfavourable economic circumstances prevalent in many developing nations, i.e. Nigeria. These conditions are characterised by insufficient economic growth, extensive unemployment, poverty, and a poor human development index (HDI). Efficient agricultural, manufacturing, transport, and communication sectors are essential for improving the quality of life, which is a reflection of economic growth and human progress.

Therefore, it is very crucial to improve the performance of sectors i.e. agriculture, industry, transport, and communication in order to promote and maintain growth and development momentum. Edeme (2014) has identified changes in the aforementioned areas as the primary driver of economic growth. FDI in the agricultural, industrial, transport, and communication sectors will have a substantial impact on the economic performance of a nation at all stages of development. FDI may enhance the productivity of the agricultural sector to satisfy the growing need for food, raw materials, foreign currency, and to promote the expansion of small industries. This, in turn, would stimulate economic growth and improve the welfare of residents. Furthermore, FDI in the industrial sector would enable the transfer of technology, leading to a rise in the production of products and services and enhancing the well-being of the nation's populace. Furthermore, the infusion of FDI into infrastructure sectors i.e. roads, communications, and electricity would effectively lower production costs, stimulate private sector investments, and enhance the profitability of businesses. Consequently, this will foster economic growth and development. Enhanced road infrastructure will decrease the expenses associated with building a new plant or transferring heavy gear. FDI in infrastructure sectors i.e. roads, communications, electricity, etc., substantially contributes to the growth of consumption, enhances worker productivity, improves employment opportunities, and fosters overall economic stability and prosperity. Furthermore, research indicates that FDI in the agricultural, industrial, transport, and communication sectors, when combined with other favourable conditions and a sustainable policy environment, would lead to increased production, economic growth, and enhanced welfare.

It is worth noting that numerous studies have documented a wide range of results regarding the effectiveness of FDI on different macroeconomic measures. However, there is a lack of empirical evidence specifically examining the impact of FDI (specifically in agriculture, manufacturing, transport, and communication) on economic growth (including economic growth and improvements in welfare as measured by the HDI) in Nigeria from 1985 to 2022. The existing literature primarily focuses on the relationship between sectoral inflow of FDI and economic growth in Nigeria, inflows of FDI in selected sectors and economic growth in Nigeria, and the impact of telecommunications sector FDI on the performance of the Nigerian economy. These studies comprise the works of Obayori et al. (2016), Ekine & Nnadi (2018), Olubunmi et al. (2021), and others. While several investigations utilised the Johansen co-integration approach, others employed the ECM, resulting in inconsistent empirical upshots. This study aimed to appraise the impact of FDI in several sectors (agricultural, manufacturing, service, transport, and communication) on Nigeria's economic growth, specifically focusing on economic growth and improvements in welfare as measured by the HDI. The study analysed data from 1985 to 2022 to address the existing vacuum in empirical research.

It is crucial to emphasise that sufficient investment is a key component that influences both sustainable economic growth and the enhancement of wellbeing. Investment is a crucial factor in enhancing production. Capital accumulation is the primary strategic element that

influences investment. The primary means by which capital accumulation is facilitated is via the act of saving. In countries with low levels of economic growth, i.e. Nigeria, it is evident that the lack of a savings culture results in insufficient savings to meet investment needs. This leads to an imbalance in the product market, which in turn hampers economic growth and the improvement of overall well-being (Obayori, et al. 2016).

The insufficiency of capital accumulation in Nigeria, particularly in LDCs, is attributed to low savings, high poverty rates, a weak financial system that hinders internal fund mobilisation, and a lack of entrepreneurial spirit among local entrepreneurs. Crucially, Nigeria has a mono-product economy that relies heavily on the oil industry. This has also been shown to be the cause of a shortage of investment capital in the nation. As an upshot, the income from it likewise varies. The current circumstances in the nation have resulted in a deficit in savings and foreign currency. These results in a substantial disparity between the current domestic investment pool and the necessary investment needed to expedite economic growth and enhance wellbeing. Foreign money has been seen as a viable option to address the deficit. Hence, in order for a nation i.e. Nigeria to bridge this investment deficit and attain the necessary level of economic growth and welfare enhancement, it is imperative to prioritise FDI. FDI facilitates the transfer of capital from foreign sources to address the investment deficit.

The available figures indicate that the influx of FDI to the nation has been very positive. In 2014, the amount of FDI inflow was ₦738.2 billion. In 2015, it was ₦602.07 billion, and in 2016, it increased to ₦1,124.15 billion. FDI amounted to ₦1,069.42 billion in 2017 and ₦704.40 billion in 2018, in congruent with the CBN in their reports from 2014, 2015, 2017, and 2018. Remarkably, the influx of FDI surged by 63.9 percent to reach US\$3.27 billion, equivalent to 0.8 percent of the Gross Domestic Product (GDP), during the specified period under review. This is a substantial increase from the previous year's figure of US\$2.00 billion, which accounted for 0.5 percent of the GDP in 2018. The increase in new equity capital may be attributed to stable macroeconomic circumstances, better ease of doing business, and policy continuity (CBN, 2019).

Obayori, et al. (2016) provided evidence to support the claim that Nigeria has seen a substantial increase in FDI because of investments in the Global System of Mobil (GSM) telephony. Nigeria is one of the most rapidly expanding telecommunications markets globally, attracting prominent developing market operators like as MTN, 9Mobile, Airtel, and Globacom, who have established their biggest and most lucrative operations in the nation. FDI is crucial for boosting Nigeria's economic growth and enhancing the well-being of its populace. In order to address the problems with macroeconomic indicators, it is necessary to have a steady and controlled flow of foreign capital that supports the growth and efficiency of an economy.

In 2016, the economy experienced substantial strain. The real sector operations were greatly limited by factors i.e. poor crude oil output, price shocks, foreign currency constraints, and energy shortfall. As an upshot, the economy shrank, as preliminary statistics showed that the Real Gross Domestic Product (RGDP), assessed at constant basic prices from 2010, decreased by 1.5%, compared to a gain of 2.8% in 2015. The production of the oil industry decreased by 13.7%, while the output of the non-oil sector decreased by 0.2%. The economy saw a modest rebound from the recession in 2017. The RGDP, measured in constant basic prices from 2010, saw a growth rate of 0.83%, which stands in stark contrast to the decline of 1.58% seen in 2016. The RGDP in 2018, calculated at constant basic prices from 2010, saw a growth rate of 1.9%, which is higher than the growth rate of 0.8% seen in 2017. The economy saw a steady expansion in 2019. The Real Gross Domestic Product (RGDP) increased by 2.3% as evaluated utilising constant basic prices from 2010. The Human Development Index (HDI) decreased from 0.41 in 1980 to 0.391 in 1985. Subsequently, it had a small increase to 0.438 in 1990 and further climbed to 0.452 in 1995. Furthermore, the HDI stayed unchanged at 0.466% in both the years 2000 and 2005. The percentage was 0.5% in 2010 and increased to 0.527 in 2015. However, in 2016, the HDI remained stagnant at 0.529%. The HDI for the years 2017, 2018, and 2019 was 0.53%, 0.53%, and 0.54%

correspondingly, in congruent with the United Nations Development Programme (UNDP) in 2019. Hence, the aforementioned situation has prompted a crucial inquiry: what is the correlation between FDI (specifically in agricultural, manufacturing, service, transport, and communication) and the economic growth of Nigeria (including economic growth and enhancement of welfare as measured by the HDI)? The primary focus of this effort was to address this issue.

II. Literature Review

Theoretical Framework

The Institutional Foreign Direct Investment Fitness Theory

In 1998, Wilhems and Witter put out this theory. Wilhem and Witter's institutional Foreign Direct Investment fitness hypothesis therefore begins a nation's capacity to satisfy both internal and external expectations of its investors, thereby providing governments with the upper-hand in managing FDI inflows. Countries, particularly developing nations, do not just draw FDI thus. There are main factors that let them reach there. The theory's advocates evaluated the primary components using what they called a "pyramid." Socio-cultural factors are included first on the pyramid because they are the oldest and most complex of all institutions, according to theory. The third step is education, which the authors believe is critical in creating a desirable environment for FDI since educated human capital boosts R&D creativity and information processing capability. Although education is not required for the influx of FDI into a given location, it is required for projects that potentially attract FDI to be launched. As an upshot, the efficacy and efficiency of FDI operations in the nation are equally viable if educational skills have an advantageous effect on output. Third on the pyramid is the market, which includes credit (financial capital) and equipment (physical capital), covering both the financial and economic aspects of institutional FDI preparation. Therefore, a major influence on the investment decision-making process of the MNC is well established and functional financial markets. On the pyramid, the government comes fourth and rather substantially. Attracting FDI most depends on the political power of a nation.

Capital Market Theory

In 1971 Aliber established the capital market theory often referred to as "currency area theory." The idea suggested that FDI upshots from flaws in the capital markets. Different host and home nation currencies drove FDI (Nayak & Choudhury, 2014). Aliber (1970; 1971) claims that compared to stronger national currencies, weaker currencies have more FDI-attractiveness and are better equipped make utilisation of the variations in the market capitalisation rate. Aliber (1970; 1971) further highlighted that as portfolio investors may not take foreign nation MNCs currency into account, source nation MNCs headquartered in hard currency locations might borrow at the rate of interest much lower than the host nation enterprises. For their investment overseas and subsidiaries, source nation companies have easier access to less expensive borrowed money than local businesses would have. Although this capital market theory applies to industrialised nations as the United States, United Kingdom, and Canada, other researchers interpreted it differently as neglecting fundamental currency risk management. Basics. Another important criticism of Aliber's postulation was Lall's (1979) study, which argued that less developed states with functioning or imperfect capital markets and those with strong control over foreign currency rates do not apply Aliber's theory.

Empirical Literature

With yearly time series of various macroeconomic factors and agricultural productivity covering the period 1990 to 2016, Edewor et al. (2018) appraised the influence of FDI and other chosen variables on the agricultural productivity. Multiple regression model and descriptive statistics were utilised in analysis of the study's data. In congruent with the analysis, with the maximum value in 2014 the amount given to the agricultural sector dropped gradually over the

years. Likewise, the factors influencing agricultural output were GDP, government policy, per capita arable land, inflation rates, and currency rates.

Examining how sector-wise FDI inflows could influence the development of certain industries in the framework of a rising nation like India, Jana, et al. (2019) utilised a time-varying parameter model with vector autoregressive specification. To get strong upshots, the research utilised many econometric tests including Johansen's cointegration test, vector error correction model, Granger causality test, variance decomposition analysis and impulse response analysis. The research shows that the inbound FDI is non-contributive to the increase of agricultural production. Reverse causation, however, shows that agricultural production is drawing greater FDI into the area. It also recorded fascinating data for the industrial sector, where the FDI influx is shown to have improved production for a few years. In the service industry, the analysis verified bidirectional causation between FDI and expansion over both short and long terms.

In 2022 Nyiwul and Koirala looked studied how foreign capital inflows support the growth of the fishery, forestry, and agricultural sectors in underdeveloped nations. The research considers endogeneity utilising a panel vector auto-regression method. Simultaneously, sixteen developing nations' worth added in the fields of agriculture, forestry, and fisheries was shown by utilising data from bidirectional causation between FDIs in these industries. These bidirectional interactions in the agriculture, forestry, and fishery show a cyclical influence between value addition and FDI. For up to five years in our model, FDI has clearly favourable effects on value addition in agriculture, forestry, and fishery. This suggests that value addition in fisheries, forestry, and agriculture will benefit from FDI in a medium to long term fashion.

Utilising graphical and regression analysis, Karner and Onyeji (2007) look at the consequence of telecommunication private investment to economic growth in Africa and CEE nations. The empirical study made utilisation of data for thirteen CEE countries and fourteen African nations covering 1999–2005. Under the pooled regression analysis, the outcome of telecommunication private investment to economic growth was judged to be positive but negligible. The consequence of telecommunication private investment on GDP was determined to be positive and substantial after nation specific effects and causality correction. Still, the improvement in GDP was not very noticeable. Except in 2005, the input of telecommunication private investment to economic growth was shown to be positive when a cross-sectional analysis was conducted; furthermore, it was also statistically substantial up to 2002. Both in the pooled and cross-sectional regression analysis, the impact of the mobile users to economic growth turned out to be positive and notable.

From 1980 to 2010, David (2013) looked at how actual telecommunication investment affected Nigerian economic growth. Owing to Solow's enhanced growth theory—where labour, capital, and technology alone define economic expansion—the model of the study was developed. Thus, cointegration and ECM allowed one to estimate economic growth utilising both completely modified OLS methods and classical least squares. The upshots revealed that labour utilised, capital stock, real investment in communications and power supply are statistically important to economic growth in the short term equilibrium in Nigeria. Thus, effective and well-coordinated policies utilised on labour productivity, price control, investment promotion, and continuous power supply would enable good economic growth.

Utilising an ECM (ECM) approach, Imoughele and Ismaila (2014) looked at how components of FDI affected the Nigerian economy over the years 1986 through 2009. The trend study revealed that largely centred on the industrial sector, foreign investors from Western Europe dominated the flow of FDI to the Nigerian economy. The upshots showed that Nigeria's economic growth was substantially influenced by ongoing influx of FDI in mining and quarrying, telecommunications, building and construction, trade and commerce and agricultural sectors.

Utilising Johansen cointegration and Toda- Yamamoto methods, Gokmenowicz et al. (2018) appraised the outcome of FDI on the HDI in Nigeria between 1972 and 21013. Upshots of

the Johansen cointegration test exposed a long-term correlation between FDI and measures of human development. Upshots of the Toda- Yamamoto test showed a long run directional causation between life expectancy at birth and FDI in many sectors including communication and transportation. It also showed unidirectional causation from FDI in main sectors like transport and communication to gross national income. They came to the conclusion that, across the sample period, FDI substantially affects the wellbeing of Nigerian people.

Utilising annual data for the period 1990–2015 and an econometric approach, Ravinthirakumaran and Ravinthirakumaran (2019) appraised the outcome of FDI inflows into substantial sectors (including transport and communication sector) on income inequality in Asia-Pacific Economic Cooperation (APEC) economies. “The upshot showed that income inequality decreased over time as FDI flowed into key industries (particularly the communication and transportation sectors). Furthermore, the researchers argued that human capital increases wealth disparity.

Kountou (2020) Kounou (2020) assessed how FDI affected HDI in South Africa utilising ARDL technique and time series data from 1990 to 2017. The upshots showed that on the nation, FDI influx has no appreciable effect on HDI both in the near future and long term. Rahma (2021) appraised from 2015 to 2019 the elements influencing FDI in East Kalimantan Province. Common least squares technique was utilised in the research. Research upshots showed that FDI in East Kalimantan is favourably and substantially influenced by GDP per capita, HDI, communication infrastructure, and length of road infrastructure factors. FDI in East Kalimantan is not much influenced by government spending factors or the infrastructure supporting the energy generation either.

In eight countries Bangladesh, Indonesia, Iran, Egypt, Nigeria, Malaysia, Pakistan and Turkey Wangpeizhi and Gul (2021) appraised the consequence of ICT infrastructure availability on FDI inflow. Utilising panel data for the years 1997–2018, the fix effect model proposed by Hausman specification test was utilised in the study. The exchange rate is a macroeconomic variable that, together with other regulatory variables like trade openness and market size, has a negative but large effect on FDI inflows. FDI flows are favourably and significantly impacted by ICT infrastructure, according to the research.

Examining FDI inflows into the agricultural, industrial, oil and gas, and telecom sectors in Nigeria, Nwafor et al. (2022) looked at how HDI changed. Adopting ex-post factor study approach, data came from the World Bank Development Report, National Bureau of Statistics, and CBN statistics Bulletin. Data were appraised utilising statistical methods like ARDL and ADF. In congruent with the analysis, FDI into agriculture had negative and substantial effect; manufacturing had positive and no substantial effect; oil and gas had negative and no substantial effect; telecommunications had positive and substantial effect on Nigeria HDI. The research found that HDI mainly in the sectors of agriculture, industry, oil and gas and telecommunications depends on the mix of FDI inflows.

Utilising ARDL technique, Mahmood and Chaudhary (2012) looked studied the relationship between FDI inflows and poverty drop in Pakistan between 1973 and 2003. The authors found that across the appraised years, FDI in manufacturing reduced poverty in Pakistan by means of other channels. Likewise, utilising OLS in a parallel research in Pakistan between 1985 and 2011, Zaman et al. (2012) discovered the same upshots. Utilising unbalanced panel analysis between 1990 and 2009, Ucal (2014) evaluated in another research the spill-over impacts of FDI on poverty level in 26 developing countries. The research came to the conclusion that poverty in the chosen nations suffers in response to FDI inflows including those in manufacturing. In the same line, Fowowe and Shuaibu (2014) estimated the impact of FDI in manufacturing on poverty in Africa from 1981 to 2011 utilising Generalised Methods of Moments (GMM). The research came to the conclusion with the evidence that FDI helped to reduce poverty throughout Africa.

Utilising variables like HDI, investment freedom, trade openness, corruption, fertility, economic freedom, and economic freedom, Margerita et al. (2021) studied the consequence of FDI on poverty in six Western Balkan nations. The stated estimates represent the use of a generalised method of moments (GMM) estimator for panel data models with fixed effects from 2002 to 21. Results demonstrated that FDI in manufacturing was a major factor in the precipitous decline in poverty rates seen by the Western Balkan states. But these funds should go towards the economy's productive sectors so that inequality and poverty may be reduced. Therefore, one should pay attention to where and how FDI takes place. The outcome also made clear that poverty reduction depends on laws and institutions supporting the economic freedom and openness of a nation. Furthermore, steps that help to raise HDI and build institutions to fight corruption can help to reduce poverty in the Western Balkan area.

Although FMFDI had an influence on macro and microeconomic variables, Djokoto et al. (2022) failed to find the human development effect, the pinnacle of economic management. An imbalanced panel data set consisting of 44 countries (18 developed and 26 developing) from 1991 to 2018 was used, along with a fixed-effects and generic technique of moment estimators. The whole economy benefited from the human development that came from FMFDI from emerging countries. Furthermore, FMFDI from industrialised nations helped the whole economy to grow humanistically. Macroeconomic environment should be improved by developing nation economic managers to encourage FDI into the food manufacturing industry. Aderemi, Omituntu, and simultaneously also Osisanwo (2022) looked at how FDI affected employment in ECOWAS's sub region between 1990 and 2019. The short run and long run link between FDI and employment throughout ECOWAS sub area was appraised utilising a panel ARDL approach. Over short terms, FDI has a negative and statistically non-substantial effect on employment. In the long term, nonetheless, FDI increases employment rate statistically substantially and favourably. This suggests that FDI may create jobs in nations within ECOWAS sub-region.

Gap and Value Addition

Different opinions and empirical results on the effect of sectoral inflow of FDI (i.e., FDI in agriculture, manufacturing, likewise transportation and communication sectors) on particular macroeconomic indicators (economic growth and welfare – HDI) are revealed by the methodical analysis of the work of other scholars and theories connected to this present research. For example, ideas comprise capital market theory and institutional FDI fit theory made it abundantly evident that FDI has no beneficial influence on macroeconomic indices. That is, FDI to raise the productivity of the agricultural sector in order to meet the rising demand for meals, raw materials, foreign currency and promote expansion of small industries would stimulate economic growth and improve the welfare of inhabitants.

Furthermore, current empirical studies on the effectiveness of FDI on different macroeconomic indicators have revealed a wealth of results; yet, there is hardly any empirical record on the impact of sectoral FDI (FDI in agriculture, manufacturing, transportation and communication) on particular macroeconomic indicators (economic growth and improvement in welfare - HDI) in Nigeria from 1980 to 2021. What is relatively readily discovered in the body of current literature: sectoral FDI flow and Nigerian economic growth. Some of these studies utilised the Johansen co-integration method, while others utilised an ECM; as an upshot, the empirical results they produced are inconsistent with one another. Specifically, the upshots show that FDI has a different impact and efficiency in different countries' agricultural, manufacturing, transportation, and communication sectors.

Previous studies neglected the consequence of sectoral influx of FDI (FDI in agricultural, manufacturing, likewise transport and communication sectors) on certain macroeconomic indices (i.e., economic growth and human development) in Nigeria. Not one of the earlier researchers addressed the years 1980 through 2021. They therefore lost contact with present reality about FDI sectoral influx and chosen macroeconomic metrics for Nigeria. This study will be

unique and different from others in view of the apparent gaps in literature since it will investigate the outcome of sectoral inflow of FDI (FDI in agriculture, manufacturing, transport and communication) on selected macroeconomic indicators (economic growth and improvement in welfare - HDI) in Nigeria from 1980 to 2021. These factors are chosen depending on their relevance in quantifying welfare development in Nigeria.

III. Methodology

Covering the period 1985 to 2022, this work made utilisation of yearly time series data on the designated variables. Secondary sources of the data were World Development Indicators (WDI) of World Bank, National Bureau of Statistics (NBS) Report, and CBN Statistical Bulletin.

Model Specification

Built on the neoclassical growth theory, which holds that FDI raises capital per person therefore influencing both human development and economic growth, the model for this research Equally, utilising variables such Foreign Direct Investment in Manufacturing Sector (FDIM), Foreign Direct Investment in Oil Sector (FDIO), Foreign Direct Investment in Transport and Communication (FDIT), this work modified the model of Obayori, et al. (2016) on the impact of sectoral inflow of FDI on economic growth in Nigeria.

$$GDP = f(FDIM, FDIT, FDIO) \dots \dots \dots .1$$

$$RGDP = F(FDIA, FDIM, FDITC, FDIS) \dots \dots \dots .2$$

From the above functional models or association between the dependent and explanatory variables, the econometric forms of the models were specified as follows

$$RGDP = F(FDIA, FDIM, FDITC, FDIS) \dots \dots \dots .3$$

Where;

RGDP = Real Gross Domestic Product, FDIA = Foreign Direct Investment in Agriculture FDIM = Foreign Direct Investment in Manufacturing, FDITC = Foreign Direct Investment in Transport and Communication

Ln= Natural Logarithm

u = Error Term

a₀, = the constant parameters

a₁ – a₃ are the slope parameters (co-efficient) of the explanatory variables. Measured as the parameters to be estimated they represent the rate of change in the dependent variables resulting from the explanatory factors. Particularly, a₁–a₃ are the actual co-efficient of FDI in manufacturing, transportation, communications, and agriculture.

Apriori Expectation: On the apriori: a₁ – a₃ > 0.

Description of Variables

The variables are defined as follow:

Dependent Variables

Economic Growth (RGDP)

In the context of economic growth, the attainment of annual increases in both the total and per capital production of goods and services is the defining characteristic of economic growth. The RGDP was utilised as a dependent variable in this investigation. It is anticipated that FDI in agricultural, FDI in manufacturing, FDI in transport and communication, government capital expenditure, and government recurrent spending would all have a beneficial impact on RGDP.

Independent Variables

Foreign Direct Investment in Agriculture (FDIA): In this study, FDI in agriculture served as an independent variable and its co-efficient is expected to be favourably related to economic growth and human development index.

Foreign Direct Investment in Manufacturing (FDIM)

The independent variable in this research is FDI in manufacturing; its co-efficient should be favourably connected to the index of human development and economic growth.

Foreign Direct Investment in Transport and Communication (FDITC)

In this study, FDI in transport and communication served as an independent variable and its co-efficient is expected to be favourably related to economic growth and HDI.

Empirical Data Analysis

Unit Root Test Result

Table 1: Augmented Dickey Fuller (ADF) Unit Root Test at Level and First Difference

Variables	Unit Root Test @ Level		Unit Root Test @ First Order of difference		integration
	ADF Statistics	5% Critical Value	ADF Statistics	5% Critical Value	
FDIA	-4.230017	-3.540328	-	-	1(0)
FDIM	-2.296379	-3.536601	-7.522440	3.540328	1(1)
FDITC	-5.453179	-3.536601	-	-	1(0)
RGDP	-1.521102	-3.540328	-3.154219	-2.945842	1(1)

Source: Computed by the researcher utilising E-Views 10 (2024).

Note: RGDP, FDIA, FDIM, FDITC as earlier defined

The ADF test upshots for every series shown in Table 1 show that, at five percent level of significance, FDIM and RGDP were stationary at first difference 1(1) while FDIA, FDITC were stationary at level 1(0). Each of their ADF numbers exceeds the threshold figure of 5%. After taking into account that the variables were integrated with orders of 1 (0) and 1 (1). In order to look into long-term partnerships, one has to satisfy the requirements to suit an ARDL model.

Table 2: ARDL Co-integration and Bounds Test for the RGDP

The long run connection among the variables in the projected model is found by utilisation of the ARDL Bounds test for co-integration. Using this, we tested for co-integration using the Pesaran and Shin ARDL Bounds method to see whether we can reject the null hypothesis that there is no co-integration. Table 2 below shows ARDL bounds test and long run test upshots.

Table 2: ARDL Bounds Test for Co-integration for RGDP

Model	F-Statistic = 33.38695	
RGDP= F(FDIA, FDIM, FDITC)	K = 4	
Critical Values	Lower Bound	Upper Bound
5%	2.56	3.49

Source: Researcher's computation utilising E-Views 10

The ARDL limits test for co-integration produces long run linkages among the variables (RGDP, FDIA, FDIM, and FDITC). This is so as the estimated F-statistic of around 33 exceeds the upper critical boundaries at 5% critical value. For the RGDP model, this offered proof to reject the null hypothesis of no cointegration at 5% significance level. This upshot led the research to derive the dynamic parameters both long-run and short-run for the variables.

Table 3: ARDL Long Run Test for RGDP Model. ARDL Selected Lags (1, 4, 4, 2, 0)

Variables	Co-efficient	t-Statistic	P-Value
LOG(FDIA)	0.056667	0.157041	0.8770
LOG(FDIM)	-1.523735	-2.136392	0.0466
LOG(FDITC)	1.549432	2.244279	0.0376

Source: Researcher's computation utilising E-Views 10

In congruent with the estimated ARDL long run co-efficient in Table 3, FDI in Nigeria's transport and communications, agricultural, and service sectors has a positive long-term connection with the nation's gross domestic product (RGDP). Concurrent with this is a negative association between FDI in the manufacturing sector and RGDP, or economic growth.

Fascinatingly, FDIs in the areas of manufacturing, transportation, and communications show strong correlation with economic growth (RGDP). FDIs in the service and agricultural sectors, however, show no appreciable correlation with economic growth (RGDP).

Table 4: Error Correction Representation for RGDP Model

Dependent Variable RGDP; ARDL Selected Lags (1, 4, 4, 2, 0)

Regressors	Co-efficient	t-Statistic	P-Value
DLOG(FDIA)	0.022040	-1.737886	0.0993
DLOG(FDIM)	-0.030522	-2.155693	0.0449
DLOG(FDITC)	-0.094697	-3.397427	0.0032
ECM (-1)	-0.068888	-15.99896	0.0000
Adjusted R ² = 0.866171	Prob(F-statist)	= Durbin-Watson Stat =	
Adjusted R-squared = 0.807985	0.000000	2.118287	

Source: Researcher's computation utilising E-Views 10

Table 4 presents the outcomes of the short-term dynamic co-efficient linked to the long-term connections derived from the ECM equation. There is a statistically significant and negatively skewed error correction component in the model. It follows that deviations from the short-term in terms of economic growth adjust to the long-term equilibrium. Table 4 confirms that the dynamic model is a suitable match. The R² value of 0.866171, which is about 0.87, shows that 87 percent of the variance in economic growth can be explained by FDIs in agricultural, manufacturing, service, transport, and communications sectors. Meanwhile, the error term accounts for the remaining 13 percent. The Durbin Watson (DW) score of 2.118287 indicates that the model does not exhibit any autocorrelation issue.

Furthermore, the co-efficient of FDIs in the agricultural, industry, and transport and communications sectors have a negative trend. These upshots do not align with the anticipated expectations. In other words, the outcomes do not align with the anticipated predictions in the field of economics. Therefore, a rise in the proportion of FDIs in agricultural, manufacturing, and transport and communications sectors would result in a decline in economic growth by 0.022040%, 0.030522%, and 0.094697% accordingly. The implications of these upshots indicate that substantial percentages of capital inflows in the agricultural, industry, and transport and communications sectors were not utilised in a productive manner". Furthermore, the t-statistic absolute values for the slope co-efficient of FDIs in the manufacturing, transport, and communications sectors are statistically substantial at the customary threshold of 5%. Hence, there exists a substantial correlation between FDIs in the industrial, transport, and communications sectors and Nigeria's economic growth. If FDIs in manufacturing, transport, and communications sectors are well handled, they will substantially impact Nigeria's economic growth.

The aforementioned upshots support the empirical research conducted by Imoughele and Ismaila (2014), likewise Adesanya and Ajala (2019), who clearly confirmed a substantial correlation between FDIs in the telecommunications and manufacturing sectors, and the economic growth in Nigeria. Continuous influx of FDIs in the industrial, transport, and communications sectors substantially impact Nigeria's economic growth. However, the magnitude of the t-statistic for the slope co-efficient of FDIs in agriculture is not statistically substantial at the customary threshold of 5%. Therefore, the research acknowledges that there is no substantial correlation between FDIs in agricultural and economic growth in Nigeria.

Post Estimation Diagnostic Tests Results

This work aims to confirm if the projected model for policy prediction or suggestion purpose is dependable by means of diagnostic testing. This work particularly utilised the Wald test for co-efficient of constraint, Breusch-Godfrey (B-G) Lagrange Multiplier (LM) test for serial correlation, Autoregressive Conditional Heteroskeaticity (Breusch-Pagan-Godfrey), and normalcy

tests for the diagnostics or post-estimation analysis. The various test upshots are provided below:

Wald Test

Each of the ECM models' causal variable co-efficient are jointly substantial utilising the Wald test to verify this. This was deduced utilising the F-statistic. Below is the test upshot:

Table 5: Wald Test for Co-efficient of Restrictions for RGDP Model (Model I)

Test Statistic	Value	Df	Probability
F-statistic	73428.00	(5, 18)	0.0000
Chi-square	367140.0	5	0.0000

Source: Researcher's computation utilising E-Views 10

Table 5 displayed the F-statistic as around 73428 and the probability value of 0.0000 as less than 0.05 at the traditional 5 percent threshold. Consequently, jointly substantial in explaining the performance of economic growth (RGDP) in Nigeria over the data period are all the explanatory variables (FDIs in agriculture, manufacturing, service, transportation and communications sectors) comprised in the estimated model (i.e., model one).

Test for Serial Correlation

In order to evaluate if there is serial correlation in the parsimonious ECM outcome at a 5% level of significance, we use the Breusch-Godfrey Serial Correlation LM test, which is a higher-order test statistic.

Table 6: Breusch-Godfrey Test for Serial Correlation for RGDP Model (Model I)

F-statistic	0.128279	Prob. F(1,17)	0.7246
Obs*R-squared	0.254637	Prob. Chi-Square(1)	0.6138

Source: Researcher's computation utilising E-Views 10

Above, we can see from Table 6 that the sparse ECM does not have a serial autocorrelation problem. This is due to the fact that both the chi-square value (about 0.25464) and the matching probability value (0.6138) are more than the 0.05 threshold.

Heteroskedasticity Test Results

The Autoregressive Conditional Heteroskedasticity test (Breusch-Pagan-Godfrey) is utilised to determine whether the variance of the residuals in the parsimonious ECM exhibits homoscedasticity.

Table 7: Autoregressive Conditional Heteroskedasticity Test Result for RGDP (Model I)

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.929061	Prob. F(15,18)	0.5522
Obs*R-squared	14.83662	Prob. Chi-Square(15)	0.4632
Scaled explained SS	2.790375	Prob. Chi-Square(15)	0.9997

Source: Researcher's computation utilising E-Views 10

Based on the results of the Breusch-Pagan-Godfrey test, which were confirmed in Table 7, it can be inferred that the residual variance in the parsimonious ECM model is homoscedastic throughout the duration of this study, since the model is free from heteroskedasticity (i.e., for model one).

Normality Test Results

The whether the error term in the ECM model is normally distributed at 5% significance level is appraised utilising the Jarque-Bera statistic.

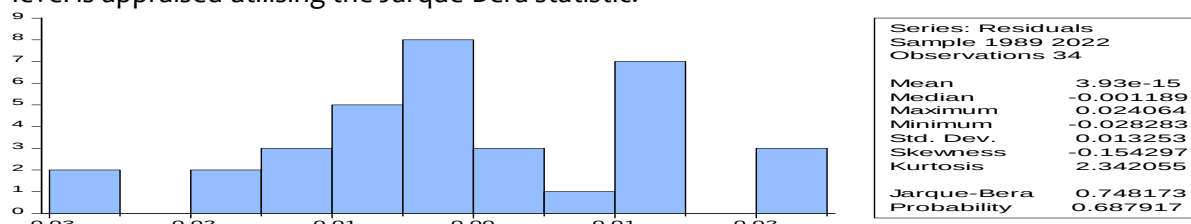


Figure 1: Normality Test Result.

The error term depicted in Figure 1 above is often distributed at the customary level that is, at 5%. This is so because the Jarque-Bera statistic's probability value, around 0.68792, above the 0.05% customary standard. This suggests that the Jarque-Bera statistical hypothesis of regularly distributed residuals in the parsimonious ECM model that is, model one is approved.

IV. Conclusion and Recommendations

Conclusion

This study on the effect of FDI on Nigeria's economic growth from 1985-2022 is very important because it appraised the extent to which FDI has impacted on Nigeria's economic growth from 1985 to 2022. From 1985 to 2022, we utilised the following econometric methods: ARDL and granger causality test. We utilised data on real gross domestic product, human development index, FDIs in agriculture, manufacturing, service, transportation, and communications from the CBN Statistical Bulletin, the National Bureau of Statistics (NBS) Report, and the World Development Indicators (WDI) of World Bank.

Notably, FDI in Nigeria's agricultural, service, industrial, and transport and communications sectors is successful in attaining economic growth, in congruent with a quick glance at the study's upshots. An important policy implication of the analysis is that if economic growth and human development is to appreciate considerably in Nigeria, then it is portentous to stress that FDI in agriculture, service, manufacturing, likewise transport and communications sectors must be further improved. In conclusion, FDIs in agriculture, service, manufacturing, likewise transport and communications sectors remain crucial in the process of achieving economic growth in Nigeria.

Recommendations

The upshots lead one to make the following policy suggestions:

Government should provide an enabling environment to increase FDIs in agriculture, manufacturing, service, likewise transport and communications sectors in Nigeria. To achieve this, government should remove all the road blocks to investment in Nigeria. The process ranges from fixing infrastructural deficits, through addressing issues of good governance, corruption and insecurity.

Funds allotted for infrastructure development should be more accountable and prudent, therefore the government should spend more in it and fiscal responsibility regulations should be appropriately enforced.

Government should guarantee that our nation's poorly maintained roads and railroads will be rebuilt or resurfaced likewise the airports that fall short when compared to some developed or developing nations of the world should be rebuilt to satisfy international best practices.

References

Akpakpan, E. B. (1999). *The Economy: Towards a New Type of Economics*. Port Harcourt: New Generation Publishers.

- Adegbite, E. O. & Ayadi, F.S. (2010). The Role of Foreign Direct Investment in Economic Development: A Study of Nigeria. *World Journal of Entrepreneurship, Management and Sustainable Development*, 6, No1/2, 133-147.
- Central Bank of Nigeria (2014). Annual Economic Report, 31st December, 2014.
- Central Bank of Nigeria (2015). Annual Economic Report, 31st December, 2015.
- Central Bank of Nigeria (2017). Annual Economic Report, 31st December, 2017.
- Central Bank of Nigeria (2018). Annual Economic Report, 31st December, 2018.
- Central Bank of Nigeria (2019). Annual Economic Report, 31st December, 2019.
- David, O. O. (2013). The Effect of Investment in Telecommunication on Economic Growth: Evidence from Nigeria. *International Journal of Advancements in Research & Technology*, 2(1), 1-23.
- Djokoto, J. G., Agyei-Henaku, K. A. A. O. & Badu-Prah, C. (2022). Welfare Effects of Agricultural Foreign Direct Investment in Developing Countries. *Frontiers in Sustainable Food Systems*, Volume 6, Article 748796, 1-11.
- Edeme, R. K. (2014). Analyzing the Effects of Sectoral Public Spending on Human Development in Nigeria: Evidence from Panel Data. *IOSR Journal of Humanities and Social Science (IOSR-JHSS)* 19(9), 01-13.
- Edewor, S. E., Dipeolu, A. O., Ashaolu O. F., Akinbode, S. O., Ogbe, A. O., Edewor, A. O., Tolorunju, E. T. & Oladeji, S. O. (2018). Contribution of Foreign Direct Investment and other Selected Variables to Agricultural Productivity in Nigeria: 1990-2016. *Nigerian Journal of Agricultural Economics (NJAE)*. 8(1), 50- 61.
- Ekine, D. I. & Nnadi, E. U. (2018). Inflows of Foreign Direct Investment in Selected Sectors and Economic Growth in Nigeria. *International Journal of Research and Innovation in Social Science*, 2(10), 83-87
- Fowowe, B. & Shuaibu, M. I. (2014). Is Foreign Direct Investment Good for the Poor? New Evidence from African Countries. *Eco Change* No. 47, Washington DC.
- Gokmenoglu, K. K., Apinran, M. O. & Taspinar, N. (2018). Impact of Foreign Direct Investment on Human Development Index in Nigeria. *Business and Economics Research Journal*, 9 (1), 1-13.
- Imoughele, L. E. & Ismaila, M. (2014). The Nature of Foreign Direct Investment and Its Impact on Sustainable Economic Growth in Nigeria. *Journal of Economics and Development Studies*, 2(1), 201-232.
- Jana, S. S., Sahu, T. N. & Pandey, K. D. (2019). Foreign Direct Investment and Economic Growth in India: A Sector-specific Analysis. *Asia-Pacific Journal of Management Research and Innovation* 15(1-2) 53-67.
- Karner, J. & Onyeji, R. (2007). Telecom Private Investment and Economic Growth: The Case of African and Central & East European Countries. Jönköping International Business School, Jönköping University. Paper within Economics, Bachelor Thesis Author: Johan Karner & Reginald Onyeji Tutor: Scott Hacker, Supervisor James Dzansi, Assistant Supervisor Jönköping December, 2007.
- Kounou, M. (2020). Impact of Foreign Direct Investment on Human Development Index in South Africa. *International Finance and Banking*, 7(1), 58-72.
- Margerita, T., Meri, P., Silvester, I. & Blerta, F. (2021). The Impact of Foreign Direct Investments on Poverty Reduction in the Western Balkans. *De Gruyter Economics* 2021; 15: 129-149.
- Mahmood, H. & Chaudhary, A.R. (2012). A Contribution of Foreign Direct Investment in Poverty Reduction in Pakistan. *Middle East Journal of Scientific Research*, 12(2), 89-97.

- Nwafor, P. K., Egungwu, I. C & Jessie, I. C. (2022). *Foreign Direct Investment Inflows and Human Development Index: Sector Level Analysis (1989-2019)*. *International Journal of Innovative Development and Policy Studies* 10(1), 27-35.
- Nyiwul, L. & Koirala, N. P. (2022). *Role of foreign direct investments in agriculture, forestry and fishing in developing countries*. *Future Business Journal*, 8(50), 1-12.
- Obayori, J. B, Obayori, E. L., Inimino, E. E & Tubotamuno, B. (2016). *Sectoral Inflow of Foreign Direct Investment and Economic Growth in Nigeria: A Co-integration Analysis*. *International Journal of Current Research*. 8(3), 27806-27811.
- Olubunmi, S., Sunday, A. J & Okpachu, E. (2021). *Nexus between Telecommunications FDI and Economic Growth: Evidence from Nigeria (2008 – 2018)*. *Kampala International University Journal of Humanities*, 6(1), 151-158.
- Ravinthirakumaran, K. & Ravinthirakumaran, N. (2019). *The impacts of foreign direct investment on income inequality: A panel autoregressive distributed lag approach for the Asia-Pacific economic cooperation developing economies*. *Asia-Pacific Sustainable Development Journal*, 25(1), 57-84
- Ucal M. S. (2014). *Panel Data Analysis Of Foreign Direct Investment and Poverty from the Perspective of Developing Countries*. *Social and Behavioral Science*, 109, 1101 – 1105.
- United Nations Development Programme - UNDP (2006), *Energizing Human Development: A Review of Energy–Human Development Nexus*. Human Development Strategy Paper.
- United Nations Development Programme (UNDP, 2019), *Human Development Strategy Paper*.
- Wangpeizhi & Gul, R. B. (2021). *The Effect of Information Communication Technology (ICT) Infrastructure availability on FDI inflow in D8 Countries*. *E3S Web of Conferences* 235, 02052 (2021), pp. 1-4.
- Zaman, K., Khan, M. M. & Ahmad, M. (2012). *The relationship between foreign direct investment and pro-poor growth policies in Pakistan: The new interface*. *Economic Modeling*, 29(7), 45-67.