



Foreign Direct Investment and the Effect on a Developing Economy

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Authors' contributions

This work was carried out in collaboration between both authors. Author SO designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors SO and AI managed the analyses of the study. Author AI managed the literature searches. Both authors read and approved the final manuscript.

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ABSTRACT

This study examined the effect of foreign direct investment on a developing economy. The study employed multiple regression models to estimate the relationship that exists between sectorial inflow of foreign direct investment and Nigeria economic growth. Augmented Dickey Fuller Test, Johansen Co-integration test, normalized co-integrating equations, parsimonious vector error correction model and pair-wise causality tests were used to conduct the investigations and analysis. The findings of the result reveal that foreign direct investment in the agricultural sector have positive but no significant effect, foreign direct investment in the manufacturing sector have positive and significant effect, foreign direct investment in the mining and quarrying sector have negative but no significant effect, foreign direct investment in the transport and communication sector have positive and significant effect while foreign direct investment in the oil and gas sector have positive and significant effect on Nigeria real gross domestic products. The study concludes that the oil and gas sector have the greatest impact on Nigeria economic growth followed by manufacturing, agricultural, transport and communication sectors while mining and quarrying reduces gross domestic product. Nigerian policy makers should design sectoral policy reforms with the intention of creating an enabling business environment, improve infrastructure, address issues of insecurity in the north and south that hinder foreign direct investment in mining and quarrying sectors. Furthermore, there is the need to strengthen policy cohesion with regards to foreign direct investments to ensure that mining and quarrying sectors perform as well as the oil and gas sector.

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1. INTRODUCTION

Nigeria economy is categorized as middle income, a mixed and emerging market economy. Nigeria economy is ranked 26th largest economy in terms of nominal gross domestic product and 24th largest in terms of purchasing power parity. In terms of production, the economy is classified in terms of primary, secondary, tertiary sectors and broadly classified as manufacturing, agricultural, transport and communication, real estate, financial, oil and gas and mining and quarrying [1]. In the last thirty years, the Nigerian economy has been heavily dependent on mining and the exploration of crude oil as its main source of revenue in running its productive economy. However, with the dwindling price of oil in the world market and the recent pandemic, the Nigerian government is seeking to diversify its economic base by seeking other possibilities.

For developing countries such as Nigeria, the importance of foreign direct investments cannot be under estimated. It is because of its importance, that the government has initiated several structural and policy reforms such as the economy liberalization in the last quarter of 1986 with [2], the abrogation of indigenization decree of 1972 and 1977 with the objective of attracting foreign direct and portfolio investment. Nigerian Investment Promotion Council (NIPC) was reformed to fashion policies and programme to improve the business environment to attract non-oil Foreign Direct Investment, Exchange Rate Monitoring Act was abolished and the indigenization policy cancelled Onoh [3]. The international flow of financial resources takes two main forms as follows: the private foreign investment and the public development assistance [4]. The former is composed of both portfolio and direct investment. Again, while portfolio investment does not involve any direct control of the firms where funds are invested, foreign direct investment mostly involves multinational corporations as the major players, who come with ownership and direct control of the firms in the host country.

Foreign direct investment is the future of economic globalization [5]. It is the transfer of non-debt financial resource among nations. It is the objective of economic integration, partnership, open economy, bilateral investment treaties Alfaro et al. [6]. Historically, foreign direct

investment can be traced back to the colonial era when the colonial masters had the intention of exploiting the resource for the development of their economies. Economic theories such as resource gap theory assumed a linear function of growths to foreign capital Jhingan [7]. The common perspective of foreign direct investment in Nigeria is that it is largely driven by natural resources and market size, but it is when foreign investment into the agriculture sector is increased which mean transfer of technology and in turn increase in output and export that poverty can be reduced [8].

There are various sector specific factors that influence the impact of foreign investment ranging from the motivation to financing of the investment. Different sectors of Nigeria economy require different conditions to acquire positive impact of foreign direct investment in the economy. The impact of foreign direct investment in primary sector can have a dual effect on the economy. Major part of foreign direct investment in primary sector comes as mega-projects with huge capital flow to a country [9]. Foreign direct investment to manufacturing sector has potential to affect the Nigeria economy as the linkages to the economy are better defined. Foreign firms in manufacturing sector invest rather than export to a country for either efficiency-seeking or market-seeking or a combination of both. Foreign direct investment brings in the technology and know-how that is compatible to the country. It generates significant employment and provides training. Foreign firm usually uses some level of local intermediate products [10].

Foreign direct investment to the services such as the transport and communication is non-tradable and require close proximity between producers and consumers. Foreign direct investment in the sector is market-seeking can affect the growth of the economy. For developing countries, the benefit of foreign direct investments are well documented [11,10], (Amoo, 2018).

Given certain assumptions, about the host country policies, the necessary infrastructure, regulatory environment and basic level of development, a multitude of studies shows that foreign direct investment makes enormous contribution in creating a competitive business environment, assisting in human capital formation, encouraging technology

transfer/spillovers, and contributes in building international trade integration [12].

With the recent external economic shocks suffered by developing countries, caused by the last global financial recession and the recent pandemic by corona virus, that has worsened the debt burden, rapid decline in investment rates, escalated levels of poverty and inequality and intensified harsh socio-economic conditions in developing countries, the need for foreign direct investments has never been so important.

The reality for most developing countries and those in Sub-Saharan African in particular, over the last decade, there has been low levels of investments, low levels of foreign direct investments. The lower rates of investments and foreign direct investments have not been without consequences. This has left most developing countries in the region with weak economic growth and vicious circles of poverty that have contributed enormously to poor human development capacity and thus causing severe economic decline and worsening human development conditions.

The situation is worse for oil producing countries like Nigeria, where oil prices in the world market has significantly declined as a result of the pandemic and rigid lock down policies by most countries to mitigate the spread of the virus. Consequently, government revenue and earning accruing from the sale of crude oil has significantly shrunk. Thus, government in Nigeria has resulted to enormous deficit spending to finance its budget. To make a bad case worse, Nigeria has become poverty capital of the world, and has surpassed India by having over a 100 million persons living on less than on dollar a day. As such, the government of the day has been forced to address the question of finding alternative source of revenue to deal with the shortfall from oil. This has necessitated the serious consideration of foreign direct investment as a tool to spark economic growth and create economic prosperity.

2. LITERATURE REVIEW

2.1 Conceptual Review

In the literature, foreign direct investment has been defined in several ways. A few of the definitions have been selected here, spanning several decades to capture differences in the way foreign direct investments has been defined over the years. Tadaro [13] defined foreign direct

investment as investment by large multinational corporations with headquarters in the developed nations.

Dunning [14] described it as an investment made by an investor based in a country to acquire assets in another country with the intention to manage the assets. Foreign direct investment is an investment made to acquire a lasting management interest (normally 10% of voting stock) in a business enterprise operating in a country other than that of the investor defined according to residency [15]. Such investments may take the form of either "greenfield" investment (also called "mortar and brick" investment) or merger and acquisition which entail the acquisition of existing interest rather than new investment [16].

In corporate governance, ownership of at least 10% of the ordinary shares or voting stock is the criterion for the existence of a direct investment relationship. Ownership of less than 10% is recorded as portfolio investment. Foreign direct investment comprises not only merger and acquisition and new investment, but also reinvested earnings and loans and similar capital transfer between parent companies and their affiliates.

As the definition reveals, foreign direct investment could be investments made by a large multinational company. Also, it could be described as an investor acquiring assets in another country or a merger and acquisition. A few insights can be drawn from examining the definitions at a deeper level, first that foreign direct investments have to come from abroad – investors could set up new plants and machinery, or investors could acquire existing stakes in host country or a merger and acquisition from investors abroad.

Foreign direct investment stimulates the economy at microeconomic and macroeconomic level, but beyond the initial investment stimulus, foreign direct investment directly influences economic growth through increasing the levels of total factor productivity. For the purpose of this research, economic growth refers to the increase in the amount of the goods and services produced by an economy over time. It is conventionally measured as the percent rate of increase in real gross domestic product, or real Gross Domestic Product.

Arthur Lewis [17] in his concept of economic growth incorporates the human element and

sees the goal of economic growth as the growth of the output per head of population. Sichel and Eckstein (1974) defined economic growth as an increase in the ability of the economy to produce commodities service. Todaro [18] defined economic growth as the increase overtime of an economy's capacity to produce those goods and services needed to improve the wellbeing of the citizens in increasing numbers and diversity. It is the steady process by which the productive capacity of the economy is increased overtime to bring about rising levels of national income.

2.2 Contending Views of Foreign Direct Investment and Economic Growth

Foreign direct investment not only provides finance but also managerial, administrative and technical personnel, new technology, research and innovations in products and techniques of production which are in short supply in Nigeria. This may, in turn, encourage local enterprise to invest more itself in ancillary industries or in collaboration with foreign enterprise. In fact, foreign enterprise encourages local enterprise in two ways: directly by fostering local enterprise with men, money, and material, and by imparting training and experience to its personnel; and indirectly by creating demand for ancillary or subsidiary services (like transport and training agents) which are uneconomical for private foreign enterprise to provide [19]. By bringing capital and foreign exchange foreign direct investment helps in filling the Foreign Direct investment and Multinationals savings gap and the foreign exchange gap in order to achieve the goal of national economic, development in Nigeria. A part of the profits from direct foreign investment is generally ploughed back into the expansion, modernization or development of related industries [5].

Foreign direct investment helps in raising productivity and hence the real wages of local labour. When foreign investment induced industrialization takes place, the real wages of the newly employed workers are higher than the real wages of workers in the rural sector of the economy. If foreign direct investment is in export-oriented industries, it leads to much higher social benefit than it is in import-substitution industries because the former have large backward and forward linkage effects. And if export industries are labour intensive, they also provide larger employment opportunities [19]. Direct foreign investment also places less burden on the balance of payments of an under Nigeria

country in the early stage of development. For, the time lag between the starting of new business concerns and the reaping of profits is large. Moreover, profits are likely to be small in the earlier stages of production. Thus, the remittance of profits from direct investment brings less pressure on the balance of payment [4]. If foreign direct investment mainly flows into agriculture and extractive industries which produce primary goods for export, it further helps in easing the balance of payments position of Nigeria. In the case of a developing country like India, foreign direct investment has a greater salutary effect on the balance of payments since it helps in producing manufactured articles, not only for the domestic market but also for foreign markets [12].

However, the recipient country may be required to provide basic facilities like land, power and other public utilities, commissions in the form of tax holiday, development rebate, rebate on undistributed profits, additional depreciation allowance, subsidized inputs, Such facilities concessions involve cost in, absorbing on Nigeria resources that could be utilized elsewhere by the government [19]. To attract foreign direct investment, Nigeria has to provide sufficient facilities for transferring profits, dividends; interest and principal. If these payments lead to a net capital outflow, they create serious balance of payment difficulties. Thus, the indirect costs of debt servicing and balance of payments adjustments create serious foreign exchange crisis thereby adversely affecting the national economy [20].

2.3 Theoretical Review

Neo-Classical Growth propounded by Robert Solow over 40 years ago believes that a sustained increase in capital investments increased the growth rate only temporarily, because the ratio of capital to labour goes up [21]. The neo-classical models treat productivity improvements as an exogenous variable which means that productivity improvements are assumed to be independent of the amount of capital investment [22]. The neoclassical economists argue that foreign direct investment influences economic growth by increasing the amount of capital per person. However, because of diminishing returns to capital, it does not influence long-run economic growth. Even though foreign direct investment is positively correlated with economic growth, host countries require minimum human capital, economic

stability and liberalized markets in order to benefit from long-term foreign direct investment inflows. Growth in neoclassical theory is brought about by increases in the quantity of factors of production and in the efficiency of their allocation.

Endogenous growth theory believes that improvements in productivity can be attributed directly to a faster pace of innovation and extra investment in human capital [23]. They stress the need for government and private sector institutions to encourage innovation and provide incentives for individual and business to be inventive. The proponent of endogenous growth theory believes that there are positive externalities to be exploited from the development of a high value added knowledge economy which is able to develop and maintain a competitive advantage in fact growth within the global economy [24]. The eclectic theory of foreign direct investment states ownership advantages, location-specific advantage and internalization gains determine the inflow of foreign direct investment into a country [14]. Location-specific advantage must derive from the macroeconomic environment as well as from the country endowments. These specific endowments include national resources, markets, labour, government policies are necessary for foreign involvement.

2.4 Empirical Review

A few papers have examined the impact of sectoral inflow of foreign direct investment and its impact on developing countries. The findings reveal that foreign direct investment is an essential ingredient in providing the necessary tools for increasing economic growth. Adigun [25] studied sectorial inflow of foreign direct investment and its impact on economic growth in Nigeria. The study used secondary data and discovered that there is a positive relationship between gross domestic product and foreign direct investment, meaning that both foreign direct investment and gross domestic product changes in the same direction. The study also found a long run, investment in the business and agricultural sectors can only make meaningful impact on the economy because it takes time to get back investment in these sectors.

Obayori et al. [26] investigated the relationship between sectoral inflow of foreign direct investment and economic growth in Nigeria. The objective of the study was to determine the impact of foreign direct investment on economic

growth in terms of selected sectors of the Nigerian economy because most other studies examined the aggregate impact of foreign direct investment on economic growth in Nigeria. A growth model was estimated via a multiple regression technique to establish the relationship between inflow of foreign direct investment to manufacturing sector, telecommunication sector, oil sector and economic growth. The variables were tested for stationarity and Johansen cointegration methods used for the analysis. The study found that continuous inflow of foreign direct investment in manufacturing, telecommunication and oil sectors have a robust impact on Nigeria's economic growth. Thus, the alternative hypothesis that there is a long run relationship between gross domestic product and sectoral inflow of foreign direct investment was accepted. Meaning that continuous inflow of foreign direct in manufacturing, telecommunication and oil sectors has the tendency to induced Nigeria economic growth.

Haider and Muhammad [27] examined the sector-wise such as agriculture, manufacturing and services, impact of foreign direct investment on economic growth. The characteristics of a sector and its linkage to the rest of an economy mainly determine the potential impact of foreign direct investment on economic growth. Intuitively, the potential linkage varies across the sectors and; hence, the sector-wise impacts of foreign direct investment might vary regarding economic growth. Empirical analysis used panel data of five countries namely China, Pakistan, India, Bangladesh and Sri Lanka over the time of 2000-2015. Robust Standard Error Model is used for this study where the results show that magnitude of foreign direct investment only in agriculture and manufacturing sectors has significant positive impact on economic growth. The estimated results showed that the foreign direct investment in manufacturing sector has the largest potential as compared to the other sectors in increasing economic growth. The impact of agriculture sector is minor though significant while that of service sector is insignificant.

Dada, Kari, Alam, Chukwu and David [28] examined the effect of foreign direct investment into the Nigeria oil sector and its impact on economic growth. The co-integration analysis was employed for the study. the results showed that foreign direct investment at current year is negatively related to gross domestic product due to fact such investment needed to be allowed some time lag to translate to any significant impact. The impact of domestic capital formation is relatively small compared with the impact of

foreign direct investment in the oil sector of the country.

Cookey et al. [29] examined the effect of Foreign Direct Investment on economic growth in Nigeria between 1980 and 2012, using annual time series data obtained from secondary sources. The econometric techniques of Ordinary Least Squares (OLS) and Co-integration were used to analyze the data. The results of the analysis revealed that FDI inflow does not significantly impact on economic growth in Nigeria. Okon et al. [30] empirically investigate the relationship between foreign direct investment and economic growth in Nigeria between 1970 and 2008. The study reveals that there is endogeneity i.e., bi-directional relationship between FDI and economic growth in Nigeria and the Single and simultaneous equation systems shows that FDI and economic growth are jointly determined in Nigeria and there is positive feedback from FDI to growth and from growth to FDI.

Ray [31] analyzed the causal relationship between Foreign Direct Investment (FDI) and economic growth in India for the period, 1990 to 2011. The empirical analysis on basis of Ordinary Least Square Method suggests that there is positive relationship between foreign direct investment (FDI) and economic growth proxy by GDP. He asserted that for FDI to be a noteworthy provider to economic growth, India would do better by focusing on improving infrastructure, human resources, developing local entrepreneurship, creating a stable macroeconomic framework and conditions favourable for productive investments to augment the process of development.

Louzi and Abadi [32] examined FDI-led growth hypothesis in the case of Jordan. The study is based on time series data from 1990 to 2009. The econometric framework of cointegration and error correction mechanism was used to capture two way linkages between variables interest. The findings indicated that FDI inflows do not exert an independent influence on economic growth. However, domestic investment has a positive impact on economic growth. Gupta and Garg [33] assessed the impact of FDI on India's economic growth, for the period 2000–2013. The study used a regression technique and established that FDI requires a time period of three years to make its contribution to the economic growth in a significant and utmost favourable manner.

Agya and Wunuji [34] conducted a study on the effect of FDI on China's economic growth, using

secondary data for the period 1995–2010. Using the Granger causality test, the authors established that used FDI does not cause economic growth in primary industry, but causes it in secondary industry; economic growth, in turn, causes FDI inflows in both secondary and tertiary industries. In determining the impact of savings and FDI inflows on economic growth in emerging Asian economies, Bayar [35] used a vector error correction mechanism (VECM) on the data covering the period 1982–2012. A positive, long-run relationship was consequently established between FDI and economic growth. In agreement with this is the finding of Faruk [36] who investigated the effect of FDI on the growth of Bangladeshi economy, using data spanning 1980–2011. Relying on the OLS technique, the author asserts that FDI has a greater impact on the country's growth. Gursoy, Sekreter, and Kalyoncu [37] investigated the relationship between FDI and economic growth in some countries (Azerbaijan, Kyrgyz Republic, Kazakhstan, Tajikistan, Turkmenistan and Uzbekistan) for the period 1997–2010. The Johansen test of co-integration and Granger causality results revealed that FDI and economic growth variables are co-integrated, with the existence of bi-directional relationship between the variables [38].

3. METHODOLOGY

This study used ex-facto quasi-experimental research design to examine sectoral inflow of foreign direct investment and the effect on economic growth in Nigeria. This study employed secondary data sourced mainly from the Central Bank of Nigeria (CBN) statistical bulletin.

3.1 Model Specification

The study models are specified below:

$$RGDP = F (FDIA, FDIM, FDIMQ, FDITC, FDI OG) \quad 1$$

Transforming equation 1 to econometrics form, we have equation 2 below:

$$RGDP = \alpha + \beta_1 FDIA + \beta_2 FDIM + \beta_3 FDIMQ + \beta_4 FDITC + \beta_5 FDI OG + e_i \quad 2$$

Where:

RGDP = Real gross Domestic Product
 FDIA = Foreign direct investment to the agricultural sector

FDIM = Foreign direct investment to the Manufacturing sector
 FDIMQ = Foreign direct investment to the mining and quarrying sector
 FDITC = Foreign direct investment to the transport and communication sector
 FDIQG = Foreign direct investment to the oil and gas sector
 et = Error Term

stationary at level, we conclude that the variables are co-integrated and as such has long-run relationship exists among them.

$$RGDP_t = w_0 + \sum_{i=1}^j \theta_i FDIA_{t-i} + \sum_{i=1}^j \varpi_i FDIM_{t-i} + \sum_{i=1}^j \varpi_i FDIMQ_{t-i} + \sum_{i=1}^j \varpi_i FDITC_{t-i} + \sum_{i=1}^j \varpi_i FDIQG_{t-i} + \mu_{1t} \quad 4$$

3.2 Techniques of Data Analysis

The main tool of analysis is the Ordinary Least Squares (OLS) using the multiple regression method for a period of 35 years, annual data covering 1985–2019. Statistical evaluation of the global utility of the analytical model, so as to determine the reliability of the results obtained were carried out using the coefficient of correlation (r) of the regression, the coefficient of determination (r²), the student T-test and F-test.

3.5 Granger Causality Test

Causality means the impact of one variable on another, in other-words; causality is when an independent variable causes changes in a dependent variable. The pair-wise granger causality test is mathematically expressed as:

$$Y_t \pi_o + \sum_{i=1}^n x_1^y Y_{t-1} \sum_{i=1}^n \pi_1^x x_{t-1} + u_1 \quad 5$$

and

$$x_t dp_o + \sum_{i=1}^n dp_1^y Y_{t-1} \sum_{i=1}^n dp_1^x x_{t-1} + v_1 \quad 6$$

3.3 Stationarity (Unit Root) Tests

Stationary test therefore checks for the stationarity of the variables used in the models. If stationary at level, then it is integrated of order zero, 1(0). Thus, test for stationarity is also called test for integration. It is also called unit root test. Stationarity denotes the non-existence of unit root. We shall therefore subject all the variables to unit root test using the augmented Dickey Fuller (ADF) test specified in Gujarati (2003) as follows.

Where x_t and y_t are the variables to be tested white u_t and v_t are the white noise disturbance terms. The null hypothesis π₁^y = dp₁^y = 0, for all l's is tested against the alternative hypothesis π₁^x ≠ 0 and dp₁^y ≠ 0. if the co-efficient of π₁^x are statistically significant but that of dp₁^y are not, then x causes y. If the reverse is true then y causes x. however, where both co-efficient of π₁^x and dp₁^y are significant then causality is bi-directional.

$$\Delta y_t = \beta_1 + \beta_2 + \delta y_{t-1} + \alpha \sum_{i=1}^m \Delta y_{t-i} + Et \quad 3$$

Where:

- Δy_t = change time t
- Δy_{t-1} = the lagged value of the dependent variables
- Σ = White noise error term

If in the above δ=0, then we conclude that there is a unit root. Otherwise there is no unit root, meaning that it is stationary. The choice of lag will be determined by Akaike information criteria.

3.6 Vector Error Correction (VEC) Technique

The presence of co-integrating relationship forms the basis of the use of Vector Error Correction Model. E-views econometric software used for data analysis, implement vector Auto-regression (VAR) based co-integration tests using the methodology developed by Johansen (1991, 1995). The non-standard critical values are taken from (Osterward, 1992).

3.4 Co-integration Test (The Johansen' Test)

It has already been warned that the regression of a non-stationary time series on another non stationary time series may lead to a spurious regression. If the residual is found to be

4. ANALYSIS OF RESULTS AND DISCUSSION OF FINDINGS

It can be seen from the Table 1 that the unit root test results, using the ADF unit root test suggest that all series are stationary at order I(1) because they become stationary after being differenced

once. Therefore, the Engle and Granger (1987) can be employed.

From Table 2, the results of the Johansen co-integration test shows that we reject the null hypotheses of no co-integrating equation at the 5% level of significance. This implies that, there is linear combination of the variables that are stationary in the long run and also confirms the existence of a long-run relationship between sectoral inflow of foreign direct investment and Nigeria gross domestic products.

The estimated regression model found that 83.3 percent variation on the Nigeria gross domestic products can be explained by variation in the sectoral inflow of foreign direct investment. When judged by the F-statistic and probability justifies that the model is statistically significant. The Durbin Watson statistic found that there is presence of serial autocorrelation. The regression coefficient and the probability value proved that foreign direct investment in the agricultural sector have positive but no significant effect on Nigeria real gross domestic products, foreign direct investment in the manufacturing sector have positive and significant effect on Nigeria real gross domestic products ,foreign direct investment in the mining and quarrying sector have negative but no significant effect on Nigeria real gross domestic products, FDITC

have positive and significant effect on Nigeria real gross domestic products while FDIOG have positive and significant effect on Nigeria real gross domestic products. We expected a positive relationship between the dependent and the independent variables. The positive effect of the variables confirm the a-priori expectation and in line with the empirical findings of Adigun [25] that long run investment in the business and agricultural sectors make meaningful impact on the economy, the findings of Obayori et al. [26] that continuous inflow of foreign direct investment in manufacturing, telecommunication and oil sectors have a robust impact on Nigeria's economic growth, the findings of Haider and Muhammad [27] that the foreign direct investment in manufacturing sector has the largest potential as compared to the other sectors in increasing economic growth. the negative effect foreign direct inflow to mining and quarrying sector on real gross domestic products contradict our a-priori expectations and confirm empirical findings such as the findings of Dada et al. [28] that foreign direct investment at current year is negatively related to gross domestic product, the findings of Cookey et al. [29] that FDI inflow does not significantly impact on economic growth in Nigeria but confirm the findings of Okon et al. [30] that there is endogeneity bi-directional relationship between FDI and economic growth in Nigeria.

Table 1. Testing for unit root (Stationarity test)

Variable	ADF Statistics	MacKinnon 1%	MacKinnon 5%	MacKinnon 10%	Prob.	Order of Int.	Summary
ADF at level							
RGDP	-0.879040	-3.653730	-2.957110	-2.617434	0.1636	1(0)	Not stationary
FDITC	-1.107364	-3.646342	-2.954021	-2.615817	0.7011	1(0)	Not stationary
FDIOG	-1.336412	-3.646342	-2.954021	-2.615817	0.4211	1(0)	Not stationary
FDIMQ	-2.040719	-3.646342	-2.954021	-2.615817	0.2689	1(0)	Not stationary
FDIM	-1.861985	-3.646342	-2.954021	-2.615817	0.2608	1(0)	Not stationary
FDIA	-0.056609	-3.661661	-2.960411	-2.619160	0.9569	1(0)	Not stationary
ADF at first difference							
RGDP	-6.666319	-3.661661	-2.960411	-2.619160	0.0000	1(I)	Stationary
FDITC	-5.473735	-3.711457	-2.981038	-2.629906	0.0001	1(I)	Stationary
FDIOG	-8.915878	-3.653730	-2.957110	-2.617434	0.0000	1(I)	Stationary
FDIMQ	-7.090581	-3.670170	-2.963972	-2.621007	0.0000	1(I)	Stationary
FDIM	-8.122315	-3.653730	-2.957110	-2.617434	0.0000	1(I)	Stationary
FDIA	-6.735396	-3.661661	-2.960411	-2.619160	0.0000	1(I)	Stationary

Source: Computed from E-View 9.0

Table 2. Johansen co-integration test results

Series: RGDP FDITC FDIQG FDIQM FDIIM FDIA					
Hypothesized No. of CE(s)	Eigenvalue	Trace statistic	0.05 Critical value	Prob.**	
None *	0.873799	193.9889	95.75366	0.0000	
At most 1 *	0.836860	127.7527	69.81889	0.0000	
At most 2 *	0.664901	69.73206	47.85613	0.0001	
At most 3 *	0.506337	34.74550	29.79707	0.0124	
At most 4	0.218275	12.15663	15.49471	0.1496	
At most 5 *	0.125097	4.276565	3.841466	0.0386	
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)					
None *	0.873799	66.23612	40.07757	0.0000	
At most 1 *	0.836860	58.02068	33.87687	0.0000	
At most 2 *	0.664901	34.98656	27.58434	0.0047	
At most 3 *	0.506337	22.58888	21.13162	0.0310	
At most 4	0.218275	7.880061	14.26460	0.3910	
At most 5 *	0.125097	4.276565	3.841466	0.0386	
Normalized Cointegrating coefficients (standard error in parentheses)					
RGDP	FDITC	FDIQG	DIQM	FDIM	FDIA
1.000000	-2.898176 (5.40940)	0.953291 (0.30432)	-3.116584 (0.98441)	-0.239957 (0.23520)	-2.881909 (5.22244)

Source: Computed from E-View 9.0

Table 3. Multiple regression results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDITC	0.731228	0.056513	0.643205	0.5253
FDIQG	1.136797	0.055012	3.690348	0.0000
DIQM	-0.208437	0.043602	-0.051547	0.9593
FDIM	1.107269	0.094167	3.394251	0.0042
FDIA	0.762636	0.063223	0.168961	0.8670
C	5.328788	0.087639	1.089333	0.2853
R-squared	0.858603	Mean dependent var		35029.27
Adjusted R-squared	0.833354	S.D. dependent var		42866.26
S.E. of regression	17499.02	Akaike info criterion		22.53646
Sum squared resid	8.57E+09	Schwarz criterion		22.80582
Log likelihood	-377.1199	Hannan-Quinn criter.		22.62832
F-statistic	34.00480	Durbin-Watson stat		1.430250
Prob(F-statistic)	0.000000			

Source: Computed from E-View 9.0

The corresponding sign of Error Correction Term (ECT) is not negative and significant. This means that there is a long run causality running from independent variables to the dependent variable. The negative sign of (ECT) indicates a move back towards equilibrium following a shock to the system in the previous year. The adjusted R² from the models proved that the independent variables can explain 86.5 percent changes on the dependent variables. The model is statistically significant from the value of f-statistic and probability. However, the ECM coefficient indicates that the model can adjust at the speed of 77.9 percent annually. The coefficient of the variables defines the effect of the independent

variables on the dependent variables at various lags.

Pair wise causality tests were run on the models with an optimal lag of 2. The result is presented in Table 5. The researcher's interest here is to establish the direction of causality between the dependent variables and the independent variables from 1986-2019. In the models there is bidirectional causality from foreign direct investment inflow to transport and communication to real gross domestic product and bidirectional causality from foreign direct investment inflow to agricultural sector to real gross domestic products and vice versa.

Table 4. Estimated vector error correction results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.507558	0.101002	0.687621	0.5010
D(RGDP(-1))	0.795721	0.091862	2.030614	0.0482
D(FDITC(-1))	1.608765	0.065640	0.742859	0.4677
D(FDIOG(-1))	-0.140140	0.015080	-2.217757	0.0399
D(FDIMQ(-1))	0.403593	0.052268	0.618754	0.5443
D(FDIM(-1))	0.118655	0.099385	2.193900	0.0489
D(FDIA(-1))	-1.882364	0.017633	-0.812192	0.4279
D(RGDP(-2))	0.303697	0.014928	0.589786	0.5631
D(FDITC(-2))	-0.215306	0.039234	-0.117063	0.9082
D(FDIOG(-2))	0.069221	0.096902	0.714339	0.4847
D(FDIMQ(-2))	-0.382405	0.069166	-0.571465	0.5752
D(FDIM(-2))	-0.061372	0.094271	-0.651011	0.5237
D(FDIA(-2))	0.640813	0.097758	0.278886	0.7837
ECM(-1)	-0.779552	0.075338	1.055935	0.0058
R-squared	0.924016	Mean dependent var		4641.618
Adjusted R-squared	0.865910	S.D. dependent var		4542.217
S.E. of regression	1663.280	Akaike info criterion		17.97342
Sum squared resid	47030526	Schwarz criterion		18.62103
Log likelihood	-264.5881	Hannan-Quinn criter.		18.18453
F-statistic	15.90238	Durbin-Watson stat		1.790165
Prob(F-statistic)	0.000001			

Source: Computed from E-View 9.0

Table 5. Pairwise granger causality tests

Null hypothesis	Obs	F-Statistic	Prob.
FDITC does not Granger Cause RGDP	32	2.91423	0.0397
RGDP does not Granger Cause FDITC		8.44564	0.0014
FDIOG does not Granger Cause RGDP	32	1.26080	0.2996
RGDP does not Granger Cause FDIOG		1.37104	0.2710
FDIMQ does not Granger Cause RGDP	32	1.01877	0.3745
RGDP does not Granger Cause FDIMQ		0.67695	0.5166
FDIM does not Granger Cause RGDP	32	1.09556	0.3488
RGDP does not Granger Cause FDIM		1.34923	0.2764
FDIA does not Granger Cause RGDP	32	2.71145	0.0445
RGDP does not Granger Cause FDIA		7.60130	0.0024

Source: Computed from E-View 9.0

5. CONCLUSION AND RECOMMENDATIONS

This study examined sectoral inflow of foreign direct investment and the effect on Nigeria economic growth from 1986-2019. While empirical studies are numerous on the effect of foreign direct investment on economic growth, the sectoral inflow of foreign direct investment and the effect on Nigeria economic growth is scarce in literature. It is important for further research on the effect of sectoral inflow of foreign direct investments in developing countries be conducted, this research is far from perfect. Some sectors in the Nigerian economy were not

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covered, and as such, the research does not categorically give a wholistic picture of the effect of sectoral inflow on foreign direct investment in Nigeria, the banking and insurance sector which is considered one of the largest sectors was not given due consideration. Further research should include such sectors as the banking and insurance, tourism, retail, healthcare, and construction to mention a few. Also, research could be extended beyond single case studies, to study multiple cases to see if the result is similar or different.

From the findings, the study concludes that FDIA have positive but no significant effect, FDIM have

positive and significant effect FDIMQ have negative but no significant effect, FDITC have positive and significant effect while FDIQG have positive but no significant effect on Nigeria real gross domestic products. by ranking the effect of foreign direct investment into the five sectors and the effect on the economy, the first sector with the greatest effect is the oil sector with 1.13 percent by a unit increase of foreign direct investment into the sector, manufacturing sector add 1.10 percent, agricultural sector by 0.76 percent, transport and communication by 0.73 percent while mining and quarrying reduces gross domestic product by 0.20 percent. From the findings, we make the following recommendations:

1. Sectoral policy reforms should be carried out by the government and management of the industries as this will attract foreign direct investment into the various sectors of the economic and enhances economic growth.
2. Policies should be directed toward increase inflow of foreign direct investment into the non-oil sector such as the manufacturing, agricultural, transport and communication as foreign direct investment inflow into these sectors have potential effect of increasing Nigeria economic growth.
3. There is need for government at all level to deepened policies to ensure stable business environment by the provision of necessary infrastructure facilities such as good electricity, which will lower the cost of doing business in Nigeria to attract foreign investors which will in turn impact positively on economic growth.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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