

Foreign Direct Investments and Economic Growth in Nigeria: A Disaggregated Sector Analysis

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Abstract

This paper attempts to investigate the impact of Foreign Direct Investment (FDI) on economic growth in Nigeria. The research developed a structural macroeconometric model consisting of four blocks made up of supply, private demand, government and external sectors. The model deploys 18 simultaneous equations and 100 variables to capture the required proxies. The research adopted a three-stage least squares (3SLS) technique and macroeconometric model of simultaneous equations to capture the disaggregated impact of FDI on the different sectors of the economy and the inter-linkages amongst the sectors in order to give better insight into the variations inherent therein. The finding shows that FDI has a significant impact on output of the economy but that the growth effects of FDI differ across sectors. The paper recommends sector-specific policies, enhanced trade openness, import substitution development strategy incentives to existing investors, and potential overseas investors so as to enhance the development of the country.

Keywords: Foreign Direct Investment, Economic Growth, Simultaneous Equation, Macroeconometric Model

1.0 Introduction

Economists are inclined to support the free flow of capital across national borders because it allows capital to seek out the highest rate of return since international ventures seek higher profit as per the Capital Arbitrage theory propounded by Samuelson (1948). Nigeria is believed to be a high-risk market for investment although blessed with enormous mineral and human resources. The co-existence of vast wealth in natural resources and extreme personal poverty referred to as the "resource curse" or 'Dutch disease' (Auty, 1993) appears to bedevil the country. In 2011, the country ranked 170 out of 213 countries with respect to the Gross National Income Per Capita which is put at US\$1,200 (The World Bank, 2011). Many analysts and experts have suggested the use of Foreign Direct Investment (FDI) as a veritable injection to kick-start the Nigerian economy. This is because FDI is not only the transfer of ownership from domestic to foreign companies but also a device for improved corporate governance and attendant transparency in business practice. Nigeria however, has one of the highest rates of investment returns in the emerging markets, presently estimated to be 30 percent (Schoeman, Robinson, & de-Wet, 2000).

Feldstein (2000) identified the provision of diversification opportunities in other climes through the international flow of capital to reduce the risk faced by owners of capital in their home countries, as one of the advantages of FDI. International investment also provides opportunities for the global transfer of technology and human capacity development in addition to the promotion of competition in the domestic input market. Despite the contributions to corporate tax revenues in the host country from profits generated by FDI, the highly capital intensive technology engendered can exacerbate the unemployment situations in labour surplus host countries. In addition, the creation of monopolies in areas where the entry barriers have been raised in some cases, may crowd out domestic operators.

The importance of FDI in the growth dynamics of countries has created much interest amongst scholars and lots of researchers have been focused on the impact of FDI on the economy. Most of the works on the role of FDI on economic growth in Nigeria have examined various aspects. However, the nature and impact of FDI especially at sub-national and sector levels have been largely ignored. Therefore, capturing the disaggregated impact of FDI on the different sectors of the economy would give better insight into the variations inherent therein. Also, there is the need to address the spill-over effects and externalities generated by FDI which is transmitted throughout the economy by examining the inter-sectoral linkages. Theoretically, ignoring these multiplier effects, when in fact they exist, may lead to biased and inefficient results. The impact of FDI may be therefore underestimated if these externalities are not factored into the estimation process which is a case of omitted variable bias (Onakoya, Tella & Osoba). This study is an attempt to remove such biases and examine the impact of the disaggregated FDI on the real sectors of the economy.

The choice of the study period covering 1970 to 2010 and spanning an assortment of economic cycles for about 77 percent of the life of the country, since attaining political independence in 1960 provides an opportunity for a comprehensive

assessment of the effect of FDI on Nigeria's economy. The remaining part of this paper is structured as follows: Section 2 focuses on the relevant literature while section 3 is on the methodology and model specification. Section 4 covers data analysis and discussion of the results. Section 5 summarizes the paper and offers some recommendations. In the next section, the review of relevant literature is presented

2. Literature Review

There have been several studies on the relationship between FDI and economic growth with conflicting findings. Türkcan, Duman, and Yetkiner (2008) test the endogenous relationship between the two variables using a panel dataset for 23 OECD countries for the period 1975-2004. They treat economic growth and FDI as endogenous variables and estimate a two-equation simultaneous equation system with the generalized methods of moments (GMM). They found that FDI and growth are important determinants of each other and in addition, that export growth rate is a statistically significant determinant of both variables. Their results indicate that there is an endogenous relationship between FDI and economic growth. The examination of the causal relationship between FDI and economic growth by Karimi and Zulkornain (2009) was based on the Toda-Yamamoto test for causality. This test which is sometimes preferred to the standard Granger causality tests does not rely so heavily on pre-testing evaluations. The assessment which is from 1970 to 2005 found no strong evidence of bi-directional causality but a long run relationship suggesting that FDI has indirect effect on Malaysia's economic growth. Chakraborty and Nunnenkamp (2008) assess the proposition that the FDI boom recorded in post-reform India is widely believed to promote economic growth. The study subject industry-specific FDI and output data to Granger causality tests within a panel cointegration framework. The result show that growth effects of FDI vary extensively across sectors. Although there is no causal relationship in the primary sector and only transitory effects of FDI on output in the services sector, FDI stocks and output are found to be mutually reinforcing in the manufacturing sector. In the services sector however, FDI appears to have caused rapid growth in the manufacturing sector through cross-sector spillovers and externalities.

In a survey of African countries Dupasquier, and Osakwe (2006) identified poor corporate governance, unstable political and economic policies, weak infrastructure, unwelcoming regulatory environments and global competition for FDI flows as impediments standing in the way of attracting significant FDI flows. This corroborates the findings of Jerome and Ogunkola (2004) which assessed the magnitude, direction and prospect of FDI in Nigeria. The authors ascribed the low level of FDI in Nigeria to deficiency in the country's legal framework concerning corporate law, bankruptcy and labour law, in addition to institutional uncertainty. The investigation of the empirical relationship between non-extractive FDI and economic growth in Nigeria was the focus of Ayanwale (2007) who reported that the determinants of FDI in Nigeria are market size, infrastructure development and stable macroeconomic policy. The contributions of Ekpo (1995)'s study which made use of time series data is that the variability of FDI into Nigeria can be explained by the political regime, real income per capita, rate of inflation, world interest rate, credit rating and debt service. In his study of the determinants of FDI in Nigeria, Anyanwu (2011) identified change in domestic investment, change in domestic output or market size, indigenization policy and change in openness of the economy as major determinants of the FDI. He further noted that the abrogation of the indigenization policy in 1995 encouraged FDI inflow into Nigerian and that efforts must be made to raise the nation's economic growth so as to be able to attract more FDI.

The review by Endozien (1998) of the linkage effects of FDI on the Nigeria economy show that the broad linkage-effects were lower than the Chenery-Watanable average (Chenery-Watanable, 1958) and was not substantial. The study of the investment trend by Ariyo (1998) and of its impact on Nigeria's economic growth over thirty five years (1970-2005) reveal that only private domestic investment consistently contributed to raising the GDP growth rates during the period. Indeed, FDI played an insignificant role. Using the Chenery and Stout two-gap model (Chenery and Stout, 1966), Oyinlola (1995) modeled foreign capital to include foreign loans, direct investments and export earnings and concludes that FDI has a negative effect on economic development in Nigeria. Adelegan (2000) apply the seemingly un related regression (SURE) model to examine the impact of FDI on economic growth in Nigeria and found out the FDI is pro-consumption and pro-import and negatively related to gross domestic investment. Akinlo (2003) submits that foreign capital was not statistically related to economic growth in Nigeria. This is corroborates the study of Ogiogio (1995) which identified the negative contributions of public investment as accounting for distortions to GDP growth in the country. Bello and Adeniyi (2010) conducted an investigation into on the causal relationship among FDI, economic growth and environment using the Autoregressive Distributed Lag (ARDL) approach by applying the annual time series data for the period spanning 1970-2006. The findings show that there was no existence of a long run relationship between FDI and growth on the one hand while there exists a long run causal link between environmental quality and FDI inflows on the other hand. The exploration of the possibility of the existence of causality between FDI and economic growth in Nigeria in the pre and post

deregulation era was conducted by Ogundipe and Aworinde, O. B. (2011) using Granger causality analysis. The result shows one-way causality relationship from economic growth (GDP) to FDI in the pre deregulation era (1970-1985) and the absence of casual relationship during the post-deregulation era (1986-2007).

Oseeghale and Amonkhienan (1987) and Brown and Obinna (2006) report that FDI is positively associated with economic growth in Nigeria. They recommend that the government should encourage greater inflow of FDI into the country in order to enhance its economic performance. Oyatoye, Arogundade, Adebisi, and Oluwakayode (2011) reviewed the effect and relationship between FDI and economic growth in Nigeria for 20 years (1987 – 2006) using Ordinary Least Square regression analysis and report a positive relationship between the two variables. The result further showed that one Naira increase in the value of FDI will lead to N104.749 increase in GDP. On the micro economic level, the review of Ayanwale and Bamire (2001) at the firm level show that productivity positive spill-over of foreign firms on domestic firm's productivity.

From the literature surveyed, the findings on the FDI–growth nexus is far from being conclusive. It is opined by Carkovic & Levine (2005) and Chakraborty and Nunnenkamp (2008) that the causal relationship between FDI and economic growth which is typified by a considerable degree of heterogeneity calls for country-specific studies. Having reviewed the literature, the next focus is on the methodological issues that captures the disaggregated impact of FDI on the different sectors of the economy.

3. Methodology and Model Specifications

3.1 Methodology

The study deploys simultaneous equation regression model as recommended by many scholars including Roller & Waverman (2001) and Belaid (2004). This is particularly critical when a dependent variable in one equation appears as explanatory variable in another equation which may lead to a feedback relationship between the variables. The paper also employs the three stage least squares (3SLS) an estimator which by its design, takes care of any probable occurrence of non-stationarity and consequential possibility of spurious regressions. Thus, there is no need to test for stationarity. It also addresses the correction of contemporaneous correlation of error terms (Zellner and Theil, 1962). In using the 3SLS estimator technique however, it is necessary to establish if the sample data actually contain sufficient information to provide estimates of the parameters (identification). In estimating the model of this study, the equations are confirmed as being over all over-identified which is the pre condition for the use of 3SLS. A number of post estimation tests to ascertain the reliability of the results obtained were conducted. These are the normality and serial correlation tests. The normality test is used to examine whether the disturbances are normally distributed or not (Jarque, & Bera, 1980). The serial correlation test examines whether the present value of the residuals depends on its past value. It is worth emphasizing that if the disturbances are either not normally distributed or serially correlated or both, the results obtained from the estimation process will be spurious and policy implications drawn from such results will be invalid. The estimation of the model was carried out with the use of E- Views™ (version 6.1).

3.2 The Empirical Model

There is the need to address the spill-over effects and externalities generated by FDI which are transmitted throughout the economy is addressed through the use of a macroeconomic model. This is a system of simultaneous equations that seeks to explain the behaviour of key economic variables at the aggregate level, based on the received theories of economics (see Akanbi & Du Toit, 2010; Annicchiarico, 2011; Brunnermeier & Sannikov, 2011 and Krishnamurty & Pandit, 1985). The model consists of 18 behavioural equations and is made up of four major blocks: supply (output), private demand (household consumption and investment by firms), government expenditure and the external sectors. The model is stated below in equations 3.17 to 3.34 starting with the supply block. The description of the variables are available as Appendix 1.

Supply Block

The supply block given by equations (3.17) to (3.31) describes the output basic macroeconomic components of the economy. In this case, the inter-sector linkages among five identified economic sectors namely agriculture infrastructure, manufacturing, oil and services sectors are described.

$$Y_{IF} = a_1 + a_2GCR_{IF} + a_3FDI_{IF} + a_4K_{IF} + a_5P_{IF} + e_1 \quad (3.17)$$

$$Y_{MFG} = a_6 + a_7GCR_{MFG} + a_8Y_{IF} + a_9Y_{OIF} + a_{10}FDI_{MFG} + a_{11}K_{MFG} + a_{12}P_{MFG} + e_2 \quad (3.18)$$

$$Y_{AGRIC} = a_{13} + a_{14}GCR_{AGRIC} + a_{15}Y_{IF} + a_{16}Y_{OIF} + a_{17}FDI_{AGRIC} + a_{18}K_{AGRIC} + a_{19}RAIN + a_{20}P_{AGRIC} + e_3 \quad (3.19)$$

$$Y_{OIL} = a_{21} + a_{22}GCR_{OIL} + a_{23}Y_{IF} + a_{24}FDI_{OIL} + a_{25}K_{OIL} + a_{27}P_{OIL} + a_{27}OPEC + e_4 \quad (3.20)$$

$$Y_{SERV} = a_{28} + a_{29}Y_{IF} + a_{30}FDI_{SERV} + a_{31}K_{SERV} + a_{32}P_{SERV} + e_5 \quad (3.21)$$

Demand Block

In the demand (expenditure) block consists of private and government demand. Equations (3.22) to (3.28) give the description of flows of interactions among variables for the private demand.

$$C_F = a_{33} + a_{34} P_F + a_{35} YDC + a_{36} IR + e_6 \tag{3.22}$$

$$C_{NF} = a_{37} + a_{38} P_{NF} + a_{39} YDC + a_{40} W + e_7 \tag{3.23}$$

$$INV_{IF} = a_{41} + a_{42} Y_{IF} + a_{43} FDI_{IF} + a_{44} GCR_{IF} + a_{45} P_{TIF} + e_8 \tag{3.24}$$

$$INV_{MFG} = a_{46} + a_{47} Y_{MFG} + a_{48} INV_{IF} + a_{49} IR + a_{50} FDI_{MFG} + a_{51} GCR_{MFG} + a_{52} P_{MFG} + e_9 \tag{3.25}$$

$$INV_{AGRIC} = a_{53} + a_{54} Y_{AGRIC} + a_{55} INV_{IF} + a_{56} IR + a_{57} YD + a_{58} GCR_{AGRIC} + a_{59} P_{AGRIC} + e_{10} \tag{3.26}$$

$$INV_{OIL} = a_{60} + a_{61} Y_{OIL} + a_{62} INV_{IF} + a_{63} FDI_{OIL} + a_{64} GCR_{OIL} + a_{65} P_{OIL} + e_{11} \tag{3.27}$$

$$INV_{SERV} = a_{66} + a_{67} Y_{SERV} + a_{68} INV_{IF} + a_{69} FDI_{SERV} + a_{70} GCR_{SERV} + a_{71} P_{SERV} + e_{12} \tag{3.28}$$

Government Block: The government demand is given by equations (3.29) to (3.31).

$$GE = a_{71} + a_{73} GRV + a_{74} (CG) + a_{75} EDS + a_{76} DDS + a_{77} Y + a_{78} FD + e_{13} \tag{3.29}$$

$$GRV = a_{79} + a_{80} Y_{IF} + a_{81} Y_{OIF} + a_{82} FDI + a_{83} NX + e_{14} \tag{3.30}$$

$$FDF = a_{84} + a_{85} FD + a_{86} NFA + a_{87} EXR + e_{15} \tag{3.31}$$

External Block: The external sector block, showing equilibrium between exports and imports, is given by equations (3.32) to (3.34).

$$X = a_{88} + a_{89} Y + a_{90} TOT + a_{91} EXR + e_{16} \tag{3.32}$$

$$M = a_{92} + a_{93} TAR + a_{94} Y + a_{95} TOT + a_{96} EXR + e_{17} \tag{3.33}$$

$$RES = a_{97} + a_{98} Y + a_{99} NFA + a_{100} EXR + a_{101} FDI + e_{18} \tag{3.34}$$

The conceptual framework of the macroeconomic model depicting the inter-linkages between the different economic sector and blocks of the economy is presented in Figure 1

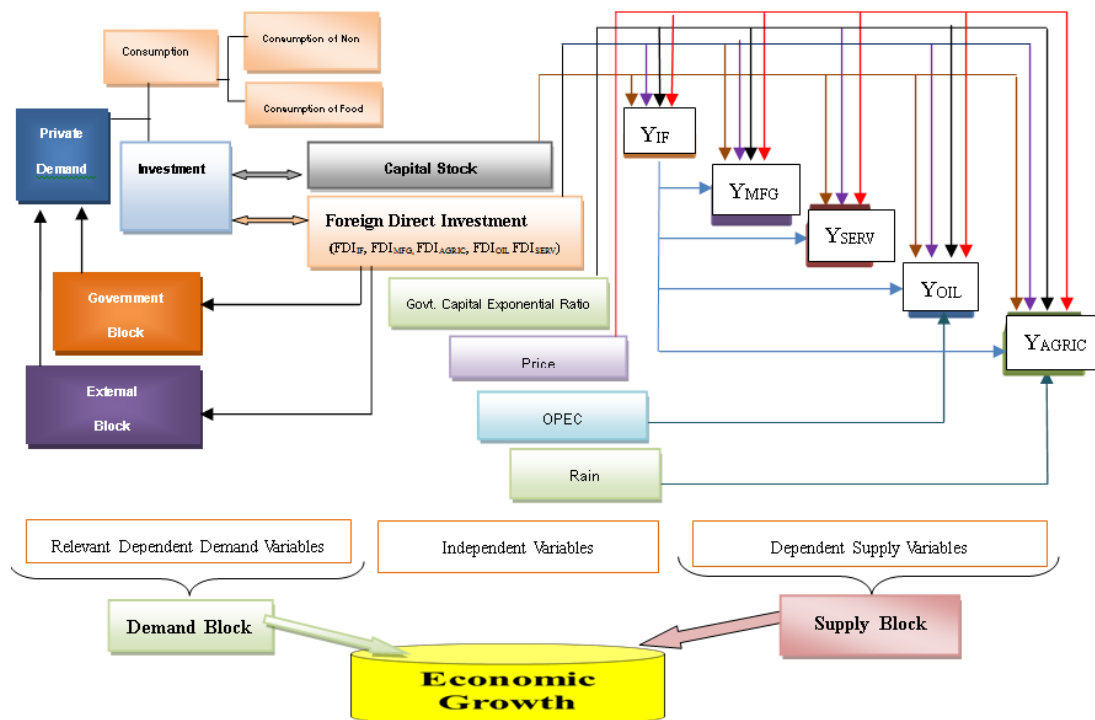


Fig. 1: Conceptual Flow of the Real Sector Channel Transmission between Telecommunications Infrastructural Investment and Economic Growth.

Source: Adapted from Onakova, Tella and Osoba (2012)

Where:

- Y_{TIF} = Output of telecommunications infrastructure
- Y_{OIF} = Output of other infrastructure
- Y_{MFG} = Output of manufacturing
- Y_{AGRIC} = Output of Agriculture
- Y_{SERV} = Output of Service
- Y_{OIL} = Output of Oil

There are three demand blocks made up of the private demand (consumption and investment), government expenditure and the external sector. In the private demand block, the consumption is made up of both food and non-food elements. The components of the government block are government revenue, its expenditure and the fiscal deficit. The external block consists of the export, import and the reserves. Investment is composed of the foreign and local investments. The schematic diagram simplifies the complex algebraic relationships hitherto represented in the system of simultaneous equations 3.17 through 3.34.

The supply block which is the aggregate output of the real sector of the economy, consists of the output of infrastructure (Y_{IF}), manufacturing (Y_{MFG}), agriculture (Y_{AGRIC}), oil (Y_{OIL}) and services (Y_{SERV}). Within the supply block, the FDI_{IF} , FDI_{MFG} , FDI_{AGRIC} , FDI_{OIL} and FDI_{SERV} are the relevant explanatory variables to the output of infrastructure, manufacturing, agriculture, oil and services respectively. The output of infrastructure (Y_{IF}) hitherto identified as dependent variables however also serve an explanatory role to the other output components of the supply block (Y_{MFG} , Y_{AGRIC} , Y_{OIL} and Y_{SERV}). The annual rainfall (Rain) and the annual output of the Organisation of Petroleum Exporting Countries (OPEC) are additional regressors of the output of agriculture (Y_{AGRIC}) and the output of oil (Y_{OIL}) respectively.

4. Data Analysis and Discussion

The results are presented in four parts. First, the impact of FDI on the composite sectors of the supply block, on relevant sectors in the private demand block, in the government block and thereafter in the external block. The result of the relationship between the output infrastructural investment (Y_{IF}) as the dependent variable and the four explanatory variables (eqn. 3.17) in Table 1 shows that the four explanatory variables (Government Capital Exponential Ratio in telecommunications infrastructure - GCR_{IF} , Foreign Direct Investment in telecommunications infrastructure (FDI_{IF}), Capital Stock of infrastructure (K_{IF}), Average Price of telecommunications infrastructure (P_{IF}) account for 97 percent ($R^2 = 0.97$) of the output of telecommunications infrastructure (Y_{TIF}). In the same vein the regressors in the equations (3.18), (3.19), (3.20) and (3.21) account for 97 percent and 98 percent, 99 percent and 99 percent respectively in explaining the variation in the output of manufacturing, agriculture, oil and services sectors.

Table 1: Results of Relevant Supply Block

Dependent Variables	FDI as Explanatory Variable	$\overline{R^2}$	Durbin-Watson Statistics
Y_{IF}	0.10255 (2.1005)	0.97	1.925
Y_{MFG}	-0.2373 -(2.3658) ^a	0.97	1.09
Y_{AGRIC}	-0.1659 -(3.5168) ^a	0.98	1.65
Y_{OIL}	1.8927 (4.1651) ^a	99	1.76
Y_{SERV}	0.1123 (2.0702)	99	1.34

Note: a, imply 1 percent significance level. *t*-statistic in parenthesis

Although the adjusted coefficients of determination (R^2) are rather high, the Durbin-Watson Statistics (DW) test results are higher in each of the cases. Therefore, the results can be accepted as valid.

The results show that there exist positive but insignificant relationships between FDI and the output of the infrastructural sector. This can be explained by the fact that the provision of infrastructure including road transportation, rail, pipelines, water, air, electricity telecommunications, post, broadcasting and water which are public non excludable goods have been in

the purview of the government. There is no case of private sector, market mediated investment during the scope of this study. FDI is also not significantly related to the output of the services sector. The provision of insurance, real estate, business services, public administration, education, health, private non-profit organisation social and community services have been dominated by Nigerians. Indeed the privatization law of 1988 in the main, put paid to the involvement of foreign companies in this sector.

The relationship between the output of manufacturing sector (Y_{MFG}) and the FDI in the sector is negative and statistically significant with a t-value of (2.37) at 1 percent level. In effect, with a coefficient value of (2.37), a percentage increase in would result in about 0.24 percent reduction in the growth of in manufacturing output. Although the privatization law of 1988 curtailed the involvement of foreign companies in primary industries, it allowed such companies to operate in heavy duty industries. FDI in the agricultural sector is also negatively related to the output of agriculture (Y_{AGRIC}) although it is statistically significant at 1 percent level. A percentage increase in the FDI in the agricultural sector of the economy would cause a reduction of about 0.17 percent. The result shows that foreign intrusion into this sector has had deleterious impact because the introduction of foreign goods and tastes has led to the abandonment of local farming. For example, the consumption of the local rice has been neglected.

With respect to the outputs of oil (Y_{OIL}), FDI is positive and significantly related at 1 percent. It has a coefficient value of (1.9) which indicates that a percentage increase in foreign investment in the oil sector would yield an increase of about 2 percent in the output of oil sector. The upstream segment of the oil and gas sector including crude, petroleum, natural gas and oil refining is dominated by foreign multinational companies. The various independent variables in the equations (3.24), (3.25), (3.27) and (3.28) of the private demand block account for between 97 percent and 99 percent of the variations in investment in the infrastructure, manufacturing, oil and services. This high value of adjusted R^2 signifies high goodness of fit.

Table 2: Result of Relevant Variables in Demand Block

Dependent Variables	FDI as Explanatory Variable	R^2	Durbin-Watson Statistics
INV_{IF}	0.1188 (7.2089)	0.97	1.34
INV_{MFG}	-0.0002 -(8.4438) ^a	0.99	1.33
INV_{OIL}	8.0808 (4.7579) ^a	0.99	1.70
INV_{SERV}	0.8332 (3.281) ^a	0.97	1.36

Note: a imply 1 percent significance level respectively. t-statistic in parenthesis

The results show that there exist positive and significant relationships between FDI and investment in the oil and service sectors at 1 percent level. An increase in FDI complemented with increase in the ratio of government expenditure on infrastructure would in the long run, lead to 8 percent increased investment in the oil sector. This is due to the facilitating role of government in the sector. Also, a percentage increase in FDI would lead to a rise 0.1 percent in the investment in infrastructure. However, the impact of FDI on investment in the manufacturing sector is negative but significant at 1 percent. This result reveals the true picture of the Nigerian economy since the economy lack basic infrastructure that can enhance the growth of the economic. In addition, the foreign firms with the advantage of technology and finance seem to be crowding out domestic producers. This result is in conformity with the work of Akanbi and Du Toit (2010).

Table 3: Result of Relevant Variable in Government Block

Dependent Variables	FDI as Explanatory Variable	R^2	Durbin-Watson Statistics
GRV	0.0642 (2.0307) ^b	0.98	2.41

Note: b, imply 5 percent significance level. t-statistic in parenthesis

The independent variables in the equations (3.30) of the government block account for 98 percent of the variations in government revenue. The higher level Durbin-Watson Statistics (DW) value indicates that the model has no serial autocorrelation problem, thus implying that the model is significant. The coefficient of FDI is statistically significant to government revenue at 5 percent level which implies that, a percentage increase in FDI would increase government revenue relative to the overall output of the economy by 0.06 percent. The increase revenue to the government accrues from contributions to corporate and other tax revenues from profits generated by FDI. The independent variables in the equations (3.30) of the external block account for 97 percent of the variations in external reserves. The Durbin-Watson Statistics (DW) value being higher than the adjusted coefficient of determination signifies no positive serial autocorrelation problem which can still be controlled.

Table 4: Result of Relevant Variable in External Block

Dependent Variables	FDI as Explanatory Variable	R^2	Durbin-Watson Statistics
RES	0.1253 (1.0902) _b	0.97	1.37

Note: b, imply 5 percent significance level. *t*-statistic in

The FDI is statistically significant to external reserves at 5 percent level. In essence, a percentage increase in FDI would increase external reserves by 0.13 percent. The increased external reserves may be due to net capital inflow and improved average balance of payment position during the period.

4.1 Post Estimation Tests

The results of the post-estimation tests conducted to ascertain the reliability of the estimates show that the disturbances are normally distributed (see Table 3). The probability value (0.99) of the joint estimation of Jarque-Bera test obtained shows that the Null hypothesis cannot be rejected.

Table 5: System Normality Tests (Joint Result)

Component	Jarque-Bera	df	Prob.
Joint	659.2963	10395	0.9917

Source: E- Views™ (version 6.1) and Author's computations.

Note: *df* is degrees of freedom for (approximate) chi-square distribution.

The serial correlation test shows that the present value of the residuals do not depend on their past values. The research found no serial correlation problem up to lag 4 for the system variable models. Specifically, the probability values for lag 1, 2, 3 and 4 in Table 4 are (0.1), (0.18), (0.13) and (0.22) respectively which are far greater than the conventional level of significance of 5 percent (0.05). As a consequence, the study does not reject the Null hypothesis, implying that there is no serial correlation.

Table 6: System Portmanteau Tests for Autocorrelations

lags	Q-Stat	Prob.	Adj Q-Stat	Prob.	df
1	426.4443	0.1740	437.3787	0.0958	400
2	804.9607	0.4442	835.8170	0.1843	800
3	1193.362	0.5486	1255.711	0.1285	1200
4	1542.235	0.8466	1643.347	0.2203	1600

Source: E- Views™ (version 6.1) and Author's computation.

Note: *df* is degrees of freedom for (approximate) chi-square distribution.

In the next section, the conclusion and recommendations are presented.

5. Conclusion and Recommendations

The conclusion of this study is that foreign direct investment contributes positively to economic growth in Nigeria. However, the relationships with the different sectors are different. Whereas, FDI is positively related to the oil sector, it is negatively related to agriculture and manufacturing. Also, although FDI significantly explains investment in the oil and service sectors at 1 percent level, it is only significant at 5 percent for government revenue and external block, and insignificant to the output of services sector. This means that policy makers armed with exact knowledge of the type of FDI projects and the disparate consequences on the different sectors of the local economy, can more accurately fashion out selective FDI policies with the view to attracting growth-promoting foreign investments. FDI determinant factors vary from sector to sector and across industries. Therefore policies based solely on aggregate foreign investments impact may lead to distortions in policy formulation and deployment.

The second plank of findings is the confirmation of inter connectivity across the sectors. The various economic blocks and sectors are linked as consequence of externalities and spill-over effects of the FDI on the economy which is hitherto largely omitted in the literature. This supports the Romer's endogenous growth theory and the Vintage capital theory. The result of this research is consistent with similar findings in both the developing and developed nations.

The negative relationship between both the investment in and output of manufacturing sector (Y_{MFG}) and the FDI in the manufacturing sector can be addressed by enhancing trade openness so as to reinforce linkages between foreign and domestic companies especially in the manufacturing sector. In addition, the government can revisit the import substitution development strategy earlier deployed shortly after political independence.

Although no country is in autarky, regional integration and globalization have resulted in large increase in foreign direct investment due to deeper integration of world economies. This has intensified the competition for FDI among developing countries and therefore makes it imperative for policy makers to devise strategies for attracting major investment flows to the country. In addition, the government should pay more attention to the enhancement of dealings with existing investors and offer them inducements to assist in marketing local investment opportunities to prospective overseas investors.

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Appendix 1: Description of Variables

Notation	Definition	Type	Unit
C _{NF}	Non –food Consumption	Endogenous	N/million
C _F	Food Consumption	Endogenous	N/million
EXR	Exchange rate	Endogenous	Index
FDF	Fiscal deficit financed by the CBN	Endogenous	N/million
INV _{AGRIC}	Investment in Agriculture	Endogenous	N/million
INV _{IF}	Investment in infrastructure	Endogenous	N/million
INV _{MFG}	Investment in manufacturing	Endogenous	N/million
INV _{OIL}	Investment in Oil	Endogenous	N/million
INV _{SERV}	Investment in Service	Endogenous	N/million
M	Import	Endogenous	N/million
NX	Net Export	Endogenous	N/million
RES	Reserves	Endogenous	N/million
X	Export	Endogenous	N/million
Y	Overall Output	Endogenous	N/million
Y _{AGRIC}	Output of Agriculture	Endogenous	N/million
Y _{MFG}	Output of manufacturing	Endogenous	N/million
Y _{IF}	Output of infrastructure	Endogenous	N/million
Y _{OIL}	Output of Oil	Endogenous	N/million
Y _{SERV}	Output of Service	Endogenous	N/million
CG	Credit to the government	Exogenous	N/million
EDS	External Debt Service	Exogenous	N/million
DDS	Domestic Debt Service	Exogenous	N/million
Notation	Definition	Type	Unit
FD	Fiscal Deficit	Exogenous	N/million
FDI _{AGRIC}	Foreign Direct Investment in agriculture	Exogenous	N/million
FDI _{MFG}	Foreign Direct Investment in manufacturing	Exogenous	N/million
FDI _{OIL}	Foreign Direct Investment in oil	Exogenous	N/million
FDI _{SERV}	Foreign Direct Investment in service	Exogenous	N/million
FDI _{IF}	Foreign Direct Investment in infrastructure	Exogenous	N/million
GE	Total Government Expenditure	Exogenous	N/million
GCR _{AGRIC}	Government Capital Expenditure ratio in agriculture	Exogenous	Ratio
GCR _{MFG}	Government capital expenditure ratio in manufacturing	Exogenous	Ratio
GCR _{OIL}	Government capital expenditure ratio in oil	Exogenous	Ratio
GCR _{SERV}	Government capital expenditure ratio in agriculture	Exogenous	Ratio
GRV	Government Revenue	Exogenous	N/million
IR	Interest rate	Exogenous	Rate
K _{AGRIC}	Capital Stock in Agriculture	Exogenous	N/million
K _{MFG}	Capital Stock in manufacturing	Exogenous	N/million
K _{IF}	Capital Stock in infrastructure	Exogenous	N/million
K _{OIL}	Capital Stock in oil	Exogenous	N/million
K _{SERV}	Capital stock in service	Exogenous	N/million
NFA	Net Foreign Assets	Exogenous	N/million
OPEC	OPEC output	Exogenous	M/Barrels
P _{AGRIC}	Price of agriculture	Exogenous	N/million
P _{MFG}	Price of manufacturing	Exogenous	N/million
P _{NF}	Price of non- food items	Exogenous	N/million
P _{OIF}	Price of other infrastructure	Exogenous	N/million
P _{OIL}	Price of oil	Exogenous	N/million
P _{SERV}	Average price of services	Exogenous	N/million
P _{IF}	Average price of infrastructure	Exogenous	N/million
P _F	Food price	Exogenous	N/million
RAIN	Annual Rainfall	Exogenous	Millimetre
TAR	Implicit Tariff	Exogenous	Rate
TOT	Terms of Trade	Exogenous	Index
YDc	Income per capita	Exogenous	N/million
W	Wealth	Exogenous	N/million

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