



Manufacturing Foreign Direct Investment, Human Capital Development and Economic Growth in Nigeria: ECM Approach

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Abstract

This study contributes to the on-going discussion on FDI relation with growth in Nigeria. It examines critically the impact of manufacturing foreign direct investment on economic growth and role played by human capital development in growth process of the country. The main argument of the paper is that FDI is not an aggregate phenomenon. Rather, it has different and even contradicting effects based on its sectoral distribution, whether it is channeled to manufacturing or other sectors of the economy. On the account of this, it should not be treated as a homogenous group. The study uses an endogenous growth model and extends the traditional production function by introducing FDI as a source of human capital accumulation and development. Using time series data between 1981 and 2013, the study employs ECM given its ability to induce flexibility by combining the short-run dynamic and long-run equilibrium models in a unified system, while ensuring theoretical rigour and data coherence and consistency. The study finds a significant positive relationship between manufacturing FDI and economic growth, which establishes the assertion that manufacturing FDI is growth enhancing. Evidence from the study also shows that human capital plays a significant positive role in the growth process of Nigeria.

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1. Introduction

The IMF benchmark definition explains FDI flows as the sum of equity capital, reinvested earnings, and other direct investment capital which include all financial transfers aimed at financing of new investments, plus retained earnings of affiliates, internal loans, and financing of cross border mergers and acquisitions. The interdependence that characterizes the globalized world, especially of the developing countries in achieving economic growth on developed countries has given foreign direct investment (FDI) a place among central contemporary issues in economic thinking. Foreign direct investment (FDI) has dominated the development areas of economics over the last few decades due to the potential effects it has on the host economy. These effects among others include its influence on production, employment, income, prices, exports and imports as well as its effect on economic growth, balance of payments, and general welfare of the host country. The importance of FDI also increased in the 1990s with the globalization of the international economy to the extent that many economists now consider FDI one of the leading factors in the changing economic environment. At this time in Nigeria, one of the expectations of a recently rebase of Nigeria's GDP which placed the country's GDP figure at \$509billion (trailed by South Africa: \$372billion) as at 2013 is more attraction of foreign capital inflow into the Nigerian economy. This new estimates arguably repositioned the country's economy as 26th largest in the world and 1st in Africa.

A logical argument based on standard economic theory predicts that capital inflows unambiguously increase investment rates in developing countries. In developed countries, savings are abundant but returns to investment are low because capital per worker is already high. In developing countries, on the other hand, returns to investment are high as capital per worker is low, but savings are scarce. Hence, if capital were allowed to move freely across national frontiers, a part of the savings of the developed world would be invested in the developing world. Therefore, the investment rate would fall below the saving rate in developed countries and rise above the saving rate in developing countries. International capital mobility, therefore, is expected to help poorer nations to achieve faster growth and thus promote economic convergence among nations. FDI has a significant contribution on economic growth and is important for developing countries because of its potential to transfer technology and knowledge, to create new jobs and to encourage entrepreneurship and competitiveness [37].

The contribution of FDI to economic development could either be through direct channels as well as indirect channels [4]. Also, the effect of FDI on growth is both theoretical and empirical and two ways by which FDI affects growth can be identified. One way is in terms of its contribution to growth through capital accumulation which leads to the incorporation of new inputs into the production process of the recipient nation, which in turn improves the output level of the country. Secondly, knowledge transfer helps to improve labour training and skill acquisition [31]. FDI helps countries to overcome their capital shortages and when there is a high risk area or when the domestic investment is limited, FDI completes domestic investment of that area [33]. One major reason why increasing number of LDCs have been making notable efforts to attract more foreign direct investment can be attributed to the lessons from the debt crisis which had plagued many of them. This has

forced them to opt for a non-debt creating inflow of capital since, equity debt requires payments irrespective of the state of the economy, while earnings from private foreign investment are frequently reinvested and only a part is repatriated. Although, one major concern of a capital importing country is the fear of foreign control of domestic assets and the possible macroeconomic instability associated with rapid changes in foreign investment levels as well as its impact on the various sectors of the economy.

Nigeria as a nation, given her natural resource base and large market size, qualifies to be a major recipient of FDI in Africa and indeed is one of the top three leading African countries that consistently received FDI in the past decade. The amount of FDI inflow into Nigeria was estimated at US\$2.23 billion in 2003 and rose to US\$5.31 billion in 2004 or an increase of 138 percent. The figure rose again to US \$9.92 billion (87 percent increase) in 2005 and a consistent increase has been maintained, although inflow into Nigeria in 2013 declined about 20% to \$5.5 billion [36]. However, conscious effort was not made to take care of the fact that more than 60 percent of the FDI inflows into Nigeria is made into the extractive industry [14]. Extractive FDI might not be growth enhancing as much as manufacturing FDI [28]. FDI has different, if not contradicting, effects based on its sectoral distribution, whether it is channeled to manufacturing, agricultural or service sectors and should not be treated as a homogenous group [26].

Despite the enormous amount of literatures in this field of study, the empirical linkage between FDI and economic growth in Nigeria is yet unclear [2]. The results of studies carried out on the linkage between FDI and economic growth in Nigeria are not unanimous in their submissions. It should be noted that such diverse conclusions will continue to emerge as long as FDI which is not only country specific, but has different effects based on its sectoral distribution is taken as a homogeneous phenomenon by scholars. The fundamental question that needs to be raised here is “Does the sectoral distribution matter in FDI inflows into Nigerian economy and which of its component (Extractive or Non-extractive) should be encouraged more through policies?” As an attempt to find answer to this question, this study analyses empirically, the relation between manufacturing component of FDI and economic growth in Nigeria between 1981 and 2013. Such study like this is particularly important for an emerging economy like Nigeria when designing an FDI promotion policy and also when negotiating the investment treaties and regime liberalization to allow FDI free entry.

2. Materials and Methods

2.1 Literature Review

2.1.1 Studies that find Positive Relationship between FDI and Economic Growth

The work Blomstrom et al can be taken as the pioneering study of the link between FDI and economic growth of [10]. They analysed the influence of FDI on growth in 78 developing countries for the period 1960 to 1985 using an endogenous growth equation. The study found a significant robust positive impact for FDI on per capita income growth in the host country. In the same manner, Baldwin et al present a theoretical model where TNCs directly affect the endogenous growth rate via technological spillovers [8]. The model in the study introduces knowledge capital as a productivity factor. The study then introduces endogenous growth and thus the study examines how FDI-linked technology spillovers encourage long-run growth. The growth in this case

stems from ceaseless product innovation driven by learning externalities in the innovation sector. The study then presents some econometric evidence using industry-level data from nine (9) OECD countries and finds that knowledge spillovers are boosted by FDI. The results of Baldwin et al are consistent with Bashir A.M. [8] [9]. Agreement in the literature supported by several empirical evidences seems to be that foreign firms through FDI do transfer technology to their affiliates; a process that can equally allow spill over to unaffiliated firms in the host economy which in turn augments growth through productivity and efficiency gains by local firms [7][16][6]. In Dutse's opinion, FDI facilitates productivity in Nigeria by generating both technological and efficiency spill over to local firms, encouraging innovation in the small and medium scale businesses, allowing technology adoption and developing human capital [13]. In addition to this, Ayanwale and Bamire report a positive spill over of foreign firms on domestic firms' productivity that are dominated by the small and medium scale businesses [7].

FDI contributes to economic growth through technology transfer with the multinational firms transferring technology either directly to their foreign owned enterprises or indirectly to domestically owned and controlled firms in the host country [35]. Following Lucas argument, FDI spurs long-run growth through such variables as research and development (R&D) and human capital [25]. It is suggested that through technology transfer to their affiliates and technological spill-over to unaffiliated firms in the host economy, foreign companies can speed up the development of new intermediate product varieties, raise product quality, facilitate international collaboration on R&D, and introduce new forms of human capital. In another serious attempt, Gao tests the effect of FDI on income growth using data from all countries in the Penn World Table, while excluding the oil producing countries [15]. In all of these cases, FDI has a positive statistically significant coefficient.

Some other empirical studies conclude that FDI contributes to total factor productivity and income growth in host economies, over and above what domestic investments would trigger [21]. The studies found out that policies that promote indigenous technological capability, such as education, technical training, and R&D, increase the aggregate rate of technology transfer from FDI and that export promoting trade regimes are also important prerequisites for positive FDI impact that would reduce the technology gap existing between developed wealthy and undeveloped poor nations. Moreover, there are other related observed evidences on positive direct technology transfer from a foreign firm to its local affiliates in terms of higher productivity levels and growth in developed as well as developing countries [16]. Further studies suggest that technical change and technological learning are main determinants of growth either of SMEs or other sector of the economy. Foreign firms may allow local firms to appropriate its technology if this guarantees its access into some of the benefits available in the host country such as access to valuable local technology and possibility of receiving commercial advantages [18].

2.1.2 Studies that do not find any Positive Relationship between FDI and Economic Growth

On the other hand, there are other studies that do not find any positive influence of FDI on economic growth. Carkovic and Levine examine the relationship between FDI and growth based on World Bank and IMF data sets covering the period 1960 and 1995 [12]. They use the Generalized Method of Moments (GMM) panel estimator to extract estimates of the impact of FDI inflows on output growth. They find that FDI inflows do not exert an

independent robust positive influence on economic growth. They show that while sound economic policies may encourage output growth and FDI, FDI does not have a positive impact on output growth that is independent of other growth determinants. In an attempt to investigate what Carkovic and Levine found out in 2002, Townsend examines the literature on the effects of FDI on growth, and he re-estimated the Carkovic and Levine model that finds no positive effect running from FDI to growth, using a data set that contains less-developed countries (LDCs) only and excludes advanced economies from the sample [34]. The results show that FDI has no robust significant effect on growth on LDCs, and therefore, these results suggest that it is unlikely that the disparate results of previous studies can be accounted for by differences in the data sets used.

Hassan examines the relation between FDI and economic growth in the context of a multivariate economic growth framework for 95 developed and developing countries over the period of 1980 and 2001, with special reference to eight MENA countries [17]. The study was to ascertain whether FDI enhances or retards economic growth with special reference to information technology. The study finds no significant effect of FDI on economic growth. Kumar also reviews the literature on the macroeconomic effects of FDI and concludes that the available evidence from the empirical studies on the effect of FDI on economic growth is mostly fraught with simultaneity problems, and that the direction of causality runs more often from growth to FDI than the other way round [23]. A survey of the most important economic empirical literature by Lipsey on the effects of FDI shows that the studies of the effects of FDI inflows on national economic growth are inconclusive [24]. Almost all studies find positive effects in some periods or among some groups of countries, in some specifications, with some controlling variables, but these effects cannot be universal as there are circumstances, periods and countries where FDI has insignificant relation with output growth.

2.1.3 Studies that find a Conditional Positive Relationship between FDI and Economic Growth

There is another category of studies that establish positive influence of FDI on economic growth when certain conditions are in place. Put differently, the studies in this category observe positive relation between FDI and economic growth based on the factors identified earlier in this study. Such factors include capital formation, technological progress, human capital, natural resources and social overhead among others. In their study, Borensztein et al emphasize the importance of the stock of human capital as a determinant for FDI's effect on growth [11]. They test the effect of FDI on economic growth in a framework of cross-country regressions using yearly data on FDI inflows from industrial countries to 69 developing countries from 1970 to 1979 and 1980 to 1989. They conclude that FDI has a positive overall effect on economic growth, with the magnitude of this effect depending on the stock of human capital available in the recipient economy. Alfaro et al argue that the effect of FDI on growth depends on the degree of development of the financial sector and they conclude that countries with well-developed financial markets gain significantly from FDI [3]. The results were robust to different measures of financial market development, the inclusion of other determinants of economic growth, and consideration of endogeneity. They reached this conclusion after examining the link between FDI and growth using cross-country data for the period 1975-1995.

The openness of the trade regime and its influence on FDI's impact on growth is highlighted by Agrawal, who tests the economic impact of FDI in South Asia and finds that the impact of FDI inflows on GDP growth rate to

be negative prior to 1980, slightly positive for the early 1980s and strongly positive in the late 1980s and the early 1990s [1]. From this he concludes that for a country to benefit from the positive effect FDI can potentially have on output growth, it has to have an open economy. The analysis is done over the period 1965-96 for five South Asian countries using a time-series cross-section panel analysis of data. The importance of the openness of the trade regime is reinforced by the study of Sadik and Bolbol, in which they investigate the effect of FDI on growth and productivity in six Arab economies (Egypt, Jordan, Morocco, Oman, Saudi Arabia and Tunisia), utilizing a derived relation between GDP growth as the dependent variable, and growth of labor, capital and total factor productivity (TFP), and FDI's effect on TFP as the explanatory variables [30].

Nunnenkamp and Spatz also criticize the view that developing countries should draw on FDI to create economic development [27]. The authors conclude that the growth impacts of FDI are ambiguous because of highly aggregated FDI data. By disaggregating FDI and considering the compatibility of different types of FDI on economic conditions prevailing in the host country, the positive growth effects of FDI are doubtful. Host country and industry characteristics as well as the interplay between both sets of characteristics determine the growth impact of FDI in developing nations. Alfaro et al. analyze the role of local financial markets in enabling FDI to promote growth through backward linkages [3]. They assert that to operate intermediate firms in the goods sector, the entrepreneurs require upfront capital investments. The more developed the local financial markets is, the easier it is for credit constrained firms to operate. The increase in the varieties and quantities of intermediate goods leads to positive spill-over to the final goods sector. Due to this, the financial markets guarantee the backward linkages between foreign and domestic firms to turn into FDI spill-over. Their results indicate that holding foreign presence constant, financially well developed economies perform almost as twice as economies with poor financial markets in term of growth. FDI contributes more in an economy with well developed financial system than in an economy with less developed financial system. Lastly, local conditions such as market structure, human capital are also important to generate a positive effect of FDI on economic growth.

2.2 Data and Methodology

This study relies heavily on the endogenous growth Theory. The most basic proposition of growth theory is that in order to sustain a positive growth rate of output per capita in the long run, there must be continual advances in technological knowledge, for which foreign direct investment is a source in the form of new goods, new markets, or new processes. This proposition is demonstrated using the neoclassical growth model developed by Solow and Swan, which shows that if there were no technological progress, then the effects of diminishing returns would eventually cause economic growth to cease [32]. The basic building block of the neoclassical model is an aggregate production function exhibiting constant returns in labour and reproducible capital. Here, there is an abstraction from all issues concerning population growth and labour supply by assuming a constant labour supply normalized to equal unity. Thus the aggregate production function can be written as a function of capital alone: $Y = F(K)$. This function expresses how much output Y can be produced, given the aggregate capital stock K , under a given state of knowledge, with a given range of available techniques, and a given array of different capital, intermediate and consumption goods. It is assumed that all capital and labour are fully and efficiently employed, so that $F(K)$ is not only what can be produced but also what will be produced.

A crucial property of the aggregate production function is that there are diminishing returns to the accumulation of capital. Thus, if we continue to equip people with more and more of the same capital goods without inventing new uses for the capital, then a point will be reached eventually where the extra capital goods become redundant except as spare parts in the event of multiple equipment failure, and where therefore the marginal product of capital is negligible. This idea is captured formally by assuming the marginal product of capital to be strictly decreasing in the stock of capital: $F'(K) > 0$ and $F''(K) < 0$ for all K . If we assume away population growth and technological change, the only remaining force that can drive growth is capital accumulation.

In an attempt to endogenize technological progress, Arrow and Romer assert that capital accumulation embeds technological improvements [5] [29]. From the usual Cobb Douglas production function:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad (1)$$

where A is the total factor productivity, Y is the total output, K is the total stock of capital and L is the Labour (level of employment). According to them, technology depends on capital stock. The higher the capital stock, the more the economy is able to use new technologies. We can then have:

$$A_t = B K_t^{1-\alpha} \quad (2)$$

Here, K is still the aggregate level of capital stock and B is the learning factor (positive externality). By putting equation (2) into equation (1), we will have

$$Y_t = B K_t L_t^{1-\alpha} \quad (3)$$

It is easy and clear to see from equation three that the technological progress is embedded in the stock of capital. Thus, any economic choice to raise capital stock is tantamount to increasing the level of technology.

Resting on the above theoretical background, this study incorporates the manufacturing foreign direct investment as a source of capital accumulation as well as technological advancement.

2.3 Model Specification

This study starts by estimating the famous production function of the Solow growth model, which represents how inputs are combined to produce output.

$$Y_t = A_t F(K_t L_t) \quad (4)$$

where, Y_t = the aggregate real output, K_t = physical capital stock, L_t = Labour input, A_t = exogenous state of technology or total factor productivity all at time t

Standard growth accounting models assume competitive markets and marginal changes in output and factor inputs, and thus the aggregates production function takes the following form expressed in equation (1) above as:

$$Y_t = A_t K_t^\alpha L_t^{1-\alpha} \quad 0 < \alpha < 1 \quad (1b)$$

Where α is the measure of the importance of physical capital in output, or the elasticity of output to capital. The equation presents the classical Solow model of economic growth. This study proceeds further by departing from the classical Solow model to the endogenous growth model following the work of Borensztein et al [11]. In both models, it is taken that at least one primary factor of production has to be produced indefinitely in order to obtain long-run growth. Thus is necessary to make this factor relatively abundant with respect to the eventual factor that cannot be accumulated, so that its productivity is not decreasing. In the classical approach, the labour input cannot be produced indefinitely because land is in limited quantity and it imposes diminishing returns to capital and labour, while in endogenous growth models the human capital input substitutes labour, and results in increasing returns to scale. This is because human capital can be accumulated and it is not produced directly or indirectly by means of natural resources, so it can be expanded indefinitely. Thus, endogenous allows us to introduce increasing returns to scale [22]. Introducing human capital to the Solow model, we have:

$$Y_t = A_t K_t^\alpha H_t^{1-\alpha} \quad 0 < \alpha < 1 \quad (5)$$

where H = human capital

To express equation five in a linear form, we take natural log of both sides to obtain equation six as follows:

$$\ln Y_t = \ln A_t + \alpha \ln K_t + (1 - \alpha) \ln H_t + \varepsilon_t \quad 0 < \alpha < 1 \quad (6a)$$

From equation six, if we let $\beta = 1 - \alpha$, it can be rewritten as equation 6b below:

$$\ln Y_t = \ln A_t + \alpha \ln K_t + \beta \ln H_t + \varepsilon_t \quad \text{for } \alpha + \beta \neq 1 \quad (6b)$$

The model in equation 6b can be transformed to include policy related variables. In this study, therefore, we introduce manufacturing foreign direct investment (MFDI) to replace stock of capital following the earlier conclusion from equation three that foreign direct investment is a source of both capital accumulation and technological progress and output (Y) is replaced by real gross domestic product. Also the study also uses level of education as a measure of human capital development, thus replacing human capital (H) by post primary school enrolment (PPE). Essentially, the growth model to be estimated considers another important factor (trade openness) which affects growth and captures the effect of the efficiency with which the economic activity is organised between the economy of Nigeria and the rest of the world, in addition to the manufacturing foreign direct investment and the human capital development. We then have equation seven below:

$$\ln G_t = \alpha_0 + \alpha_1 \ln MFDI_t + \alpha_2 \ln PPE_t + \alpha_3 \ln TO_t + \varepsilon_t \quad (7)$$

where G = real gross domestic product, MFDI = manufacturing foreign direct investment, PPE = Post Primary School Enrolment and TO = trade openness

Recent empirical studies have shown that major economic variables may individually be a non-stationary process rather than a trend-stationary process as generally assumed in the conventional methodology of empirical analysis. This simply implies that the conventional approach in regression could give spurious regressions and has not always yielded reliable results. A major problem in the conventional methodology of empirical analysis is that they typically specify their lag structure as a simple process of partial adjustments by imposing a very strict restriction on the model's lag structure prior to estimation. A better way of specifying a model's lag structure is to derive information on the lag structure from the data itself making the dynamic specification of the model to be data based instead of imposing an untested restriction in advance (theory-based dynamic specification). The Error Correction Model eliminates these prior restrictions on the lag structure of a model and determines them according to direct information from economic data.

On this basis of the above, this paper uses ECM to look at the impact of manufacturing foreign direct investment on economic growth and the role human capital development and trade openness play in the process given ECM's ability to induce flexibility by combining the short-run dynamic and long-run equilibrium models in a unified system, while ensuring theoretical rigour and data coherence and consistency. Empirical studies have also shown that the ECM is best suited for model estimation when economic variables that are individually non-stationary are co-integrated, implying long-run relationship between them.

There is an assumption that the real income (G) in equation (7) may not immediately adjust to its long-run equilibrium level following a change in any of its determinants [20]. Hence, the discrepancy between the short-run and the long-run levels of income can be investigated by the following error correction model

$$\Delta \ln G_t = \alpha + \sum_{i=1}^{\rho} \beta_i \Delta \ln G_{t-i} + \sum_{i=0}^{\rho} \delta_i \Delta \ln MFDI_{t-i} + \sum_{i=0}^{\rho} \gamma_i \Delta \ln PPE_{t-i} + \sum_{i=0}^{\rho} \theta_i \Delta \ln TO_{t-i} + \varphi \varepsilon_{t-1} + \mu \quad (8)$$

Where ε_{t-1} is one period lagged Error Correction Term (ECT), which shall be taken from estimated equation (7). The ECT in equation (8) shows how fast the disequilibrium between the short-run and the long-run values of dependent variable is eliminated each period. The expected sign of ECT is negative [20].

Data used for this study are annual figures covering the period of 1981 to 2013. Variables used in this study are real gross domestic product (G), manufacturing foreign direct investment (MFDI), post primary school enrolment (PPE) and trade openness (TO). The source of data is the CBN statistical bulletin (2013), annual reports and statement of accounts. Other sources of reliable data are also explored which include National Bureau of Statistics Reports (2012), Universal Basic Education (2013) Report as well as the World Development Index (2012).

3. Results

Table 1: Unit Roots: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Test At Levels

Statistics	lnG	lnMFDI	lnPPE	lnTO	Lag
ADF _{td}	-1.5357	-2.5993	-2.5993	-1.2918	3
ADF _d	-2.5884	-1.1086	-1.1086	-1.0210	3
ADF _n	6.0357	3.4102	3.4102	-0.0072	3
PP _{td}	-1.3232	-1.6098	-1.6098	-1.2272	3
PP _d	-5.6356*	-1.0880	-1.0880	-1.0305	3
PP _n	5.4138	2.8640	2.8640	-0.1750	3

Source: Author's Computation

*, **, and *** denote the rejection of null hypothesis (variable has unit root) at 1%, 5% and 10% levels of significance respectively

Table 2: Unit Roots: Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Test At First Difference

Statistics	lnG	lnMFDI	lnPPE	lnTO	Lag
ADF _{td}	-4.6908*	-4.7069*	-4.7069*	-6.6500*	3
ADF _d	-4.0971*	-4.6548*	-4.6548*	-6.3989*	3
ADF _n	-2.2830**	-1.9976**	-1.9976**	-5.2373*	3
PP _{td}	-5.7691*	-4.7069*	-4.7069*	-6.6573*	3
PP _d	-4.0472*	-4.6416*	-4.6416*	-6.3989*	3
PP _n	-2.3001**	-3.6818*	-3.6818*	-5.3160*	3

Source: Author's Computation

*, **, and *** denote the rejection of null hypothesis (variable has unit root) at 1%, 5% and 10% levels of significance respectively

Testing for the existence of unit roots is of major interest in the study of time series models and co-integration. The presence of a unit root implies that the time series under investigation is non-stationary, while the absence of a unit root shows that the stochastic process is stationary. The time series behaviour of each of the series in this study using the Augmented Dickey-Fuller (ADF) and Philip Perron (PP) is presented in tables 1 and 2 above. The subscript 'td' indicates test with trend and drift, which represents the most general process of testing unit root, 'd' indicates model with drift, but without trend, while 'n' indicates test without both trend and drift which represents the most restricted model or process. The lag length given in tables 1 and 2 are as determined by SIC in ADF test and by Bartlett-Kernel in PP test. The results from the two tables show that all the variables are not stationary at levels, but they become stationary after first difference, implying that all the variables are integrated of order one, I(1). The observed properties of these variables justified the need to carry out

cointegration test to establish if there is a long run relationship between the series before the Error Correction Model specified in equation 8 above is estimated.

Table 3: Co-integration: Johansen Co-integration Tests – Trace Statistic

Series	Hypothesized Number of CE(s)	Trace Statistic	5% Critical Value	1% Critical Value
LNG, LNMFDI, LNPPE & LNT0	$H_0: r = 0^*$	126.5452	47.8561	54.6815
	$H_0: r \leq 1^*$	61.6242	29.7971	35.4582
	$H_0: r \leq 2^*$	28.9435	15.4947	19.9371
	$H_0: r \leq 3^*$	7.4645	3.8415	6.6349

Source: Author's Computation

r = number of cointegrating equations, * denote the rejection of null hypothesis at 1% level of significance respectively

Table 4: Co-integration: Johansen Co-integration Tests – Max-Eigen Statistic

Series	Hypothesized Number of CE(s)	Max-Eigen Statistic	5% Critical Value	1% Critical Value
LNG, LNMFDI, LNPPE & LNT0	$H_0: r = 0^*$	64.9210	27.5843	32.7153
	$H_0: r \leq 1^*$	32.6801	21.1316	25.8612
	$H_0: r \leq 2^*$	21.4790	14.2646	18.5200
	$H_0: r \leq 3^*$	7.4645	3.8415	6.6349

Source: Author's Computation

r = number of cointegrating equations, * denote the rejection of null hypothesis at 1% level of significance respectively

As can be observed clearly from both tables 3 and 4; there exists a long run relationship between the variables of interest in this study. Both the Trace statistic and Max-Eigen statistic from tables 3 and 4 respectively indicate the rejection of null hypotheses, both at 1% and 5% levels of significance. Specifically, both Trace and Max-Eigen value tests indicate four (4) cointegrating equations at 1% and 5%. Thus, even though the variable: LNG, LNMFDI, LNPPE and LNT0 are not individually stationary, a linear combination of all the series is found to be stationary. Having identified the co-integrating vector using Johansen Cointegrating Test, we proceed to investigate the dynamics of the economic growth process.

Table 5: Estimated ECM Regression Results for Economic Growth Model

Dependent Variable: D (LNG)

Included Observations: 28 after adjustments

Variable	Coefficient	t-statistic	Pro. Value
C	-0.0445	-1.4016	0.1772
D(LNG(-1))	1.1524	3.3226	0.0036
D(LNG(-4))	0.7369	2.3761	0.0282
D(LNMFDI(-1))	0.2087	2.7695	0.0122
D(LNMFDI(-2))	0.1327	2.0330	0.0566
D(LNPPE(-1))	0.2921	1.9771	0.0627
D(LNTO)	0.0895	2.1978	0.0406
D(LNTO(-1))	0.1392	3.2761	0.0040
ECT(-1)	-0.4005	-3.9310	0.0009
R-squared	0.5376	S.D. Dependent Var.	0.0778
Adjusted R-squared	0.3429	F-statistic	2.7610
S.E. of Regression	0.0630	Pro(F-statistic)	0.0330
Durbin-Watson Stat.	2.1193	Mean Dependent Var.	0.0428

Source: Author's Computation

Table 5 above presents the final parsimonious estimated equation. The results show that the coefficient of the error correction term (ECT) for the estimated economic growth equation is both statistically significant and negative. This implies that it will appropriately correct for any deviations from long-run equilibrium. Specifically, if actual equilibrium value is too high, the error correction term will reduce it while if it is too low, the error correction term will raise it. The explanatory variables explain about 34 percent of the variations in economic growth. This is adjudged by the value of the coefficient of determination, Adjusted R-squared. There is no serial autocorrelation given the value of Durbin Watson Statistic which falls within the acceptable region. In addition, the probability of the F-statistic suggests that the model has a very good fit. The results support earlier conclusion under cointegration test that the variables constitute a co-integrated set. The coefficients of both the current level and lagged period of trade openness (TO) are positive and significant. This implies that the degree of openness of Nigerian economy to the rest of the world has a strong positive influence on the present economic growth of the nation. In the same manner, both one and four lagged periods' real gross domestic product have significant positive impact on the current level of real income, implying that economic growth is self influencing and enhancing. Also both one and two lagged periods' manufacturing direct investment and one lagged period's post primary enrolment have significant positive impact on the changes in real gross domestic product. These results are consistent with the findings of Lucas, UNCTAD report, Gao,

Bashir A.M., Baldwin et al and Dutse, all of who found an unconditional positive relationship between foreign direct investment and economic growth using different samples of countries and levels of data [25,35,15,9,8,13]. It can therefore be inferred from the findings of this study that the inflows of manufacturing foreign direct investment into Nigerian economy is actually growth enhancing. Also, even though this study does not consider the rate of drop-outs, it finds a strong positive influence of post primary enrolment on the economy growth of the economy.

4. Conclusion

Most studies on the foreign direct investment in Nigeria have viewed the subject matter as a homogenous phenomenon. Some have taken a step further to dichotomize it, although just for the purpose of identifying the components of the aggregate foreign direct investment, not for the purpose of identifying or examining the specific impact of individual components on the growth performance of the Nigerian economy. In an attempt to contribute to the ongoing economic thinking on the subject matter, this study seeks to bridge this gap by taking the responsibility of examining critically how one component of the foreign direct investment will impact economic growth in Nigeria. Specifically, the study examines the impact of manufacturing foreign direct investment on economic growth in the presence of other factors affecting economic growth, especially human capital development. The study finds a significant positive relationship between manufacturing foreign direct investment and economic growth in Nigeria. These findings are important for policy making when designing FDI promotional policies to know which kind of FDI contributes positively to growth.

When designing a policy for FDI, Nigeria must focus on how to benefit from FDI by attracting the right kind of FDI. Since the positive impact of FDI on growth is the main rationale behind FDI promotion schemes in any economy, only the FDI contributing positively to growth should be encouraged. Other forms of FDI should get no preferential treatment. This study suggests that adequate effort should be made to identifying the determinants of FDI to the manufacturing sector to design policies geared towards ensuring that the country attracts this kind of FDI which it really needs. Also, much attention should be given to policies that will bring about continuous human capital accumulation and development.

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