



Impact of Foreign Direct Investment on Manufacturing Sector Output Growth in Nigeria

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Abstract

The role of the manufacturing sector in economic growth and development cannot be over-emphasized. Economic theory enthuses that economic growth can be further realized when the manufacturing sector makes steady positive contribution in the overall GDP growth rate. In an attempt to harp on this, this study investigates the impact of foreign direct investment (FDI) on manufacturing sector output growth in Nigeria for the period 1970 – 2016 using OLS and Granger causality tests analysis. Due to various constraints including paucity of funds capital, the positive contribution of the manufacturing sector has not been encouraging. So the need for foreign capital inflow may be a welcome development. Thus, the study estimates a logarithmic model of the impact of FDI inflow on manufacturing output growth in Nigeria in order to assess its possible contribution to economic diversification of the Nigerian economy which has been heavily dependent on the energy sector. The findings of this study reveal that there is a long-run relationship between FDI and manufacturing sector output growth (MSOG) though statistically insignificant. Granger causality result shows that there is a unidirectional causality from FDI and MSOG. The study recommends that the variables; electricity generation, exchange rate, private sector credit and political stability which show significant relationships to MSOG should be given priority by the government policy makers to diversify the economy through the manufacturing sector.

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1. Introduction

Foreign direct investment (FDI) in this recent time became ever more important in developing countries of the world and growing number of developing countries like Nigeria ensuing in attracting considerable amounts of FDI. The purpose of foreign investment is to serve as a means of augmenting the less-developed countries' domestic resources to effectively carry out her developmental programmes, promote rapid industrialization and eventually raise the output of the business sector such as manufacturing. Therefore, the importance of foreign direct investment is to improve the output of manufacturing sector in the less developed countries of the world.

However, if Nigeria creates conducive environment for FDI, its potential benefits can include employment generation and increase in turnover of the sector. Foreign direct investment can influence output of manufacturing in any given country and also output of manufacturing can further influence more foreign direct investment in any developing countries. Foreign direct investment has attracted a great number of attentions of developing countries since the development of manufacturing sector is set toward investment in capital and technology. The expatriate coming to invest provides these and ensures adequate output in the sector in terms of turnover. The turnover or output of manufacturing sector increases with the help of FDI inflow. These firms will come with some competitive advantages and their interaction with the indigenous manufacturing industries impact them favorably by the learning effect to improve on their productivity.

Over the years, government of Nigeria has encouraged foreign direct investment through trade openness and there had been an increasing inflow of FDI into the country relatively in the 1990s which has also created more diversification of FDI into the manufacturing sector in particular. However, In spite of the huge amount of FDI inflow into the Nigerian manufacturing sector ranging from US\$2.96 billion in 2003 to US\$4.44 billion in 2004, and this figure rose again to US\$ 5.08 billion in 2009 (World Bank, 2012). Yet, the output in the manufacturing sector is not so encouraging.

From the extant literature, it is realized that studies have been conducted on foreign direct investment and output of manufacturing sector in Nigeria but none of these studies was comprehensive enough in postulating the impact of foreign direct investment on the manufacturing sector output growth in Nigerian economy as the results were mixed.

2. Literature Review

2.1. Concept of Foreign Direct Investment

As per Chen (1983) foreign direct investment is the interest in which a firm secures a considerable controlling enthusiasm for an outside firm (over 10 percent offer) or sets up an auxiliary in an outside nation. According to Hannon and Reddy (2012) FDI involves mergers and acquisitions (M & As), construction of new offices, reinvesting benefits realized from foreign activities and intra organization credits. Foreign direct investment (FDI) is the procedure where individuals in one nation acquire control over the creation, dissemination and different functions of a firm in an outside nation (Moosa, 2002). Foreign direct investment is a cross-fringe venture made by an occupant in one economy (the immediate financial specialist) with the target of building up an enduring enthusiasm for an endeavor (the immediate speculation undertaking) that is inhabitant in an economy other than that of the immediate speculator (OECD, 2008). Glass and Saggi (2009) were of the opinion that foreign direct investment alludes to a development of capital that includes possession and control of a firm in another nation. FDI is expected to enlarge local capital in this way by empowering the efficiency of residential speculations.

As indicated by Nwankwo (2006) foreign direct investment is a sort of speculation whether in genuine or monetary resources over the national limits of the speculators. In any case, outside direct venture incorporate the human capital, merchandise and enterprises, innovation, ideas, administration standards exchange from one nation to different nations particularly the creating nations. It is the venture of one nation into another nation as it is a cross outskirts speculation with the less created nations of the world. Otepolo (2002) states that foreign direct investment is the most critical wellspring of outside assets streams to creating nations throughout the years which has turned into a huge piece of capital arrangement in these nations. As indicated by Athukorala (2003) FDI gives genuinely necessary assets to creating nations, for example, capital, innovation, administrative aptitudes, entrepreneurial capacity, brand and access to business sectors which are fundamental for creating nations to industrialize, create, make occupations and assault the destitution circumstance in their countries. Adeoye (2009) characterize FDI as the long haul speculation that mirrors the goal of an enduring premium and control by an inhabitant substance of one economy (the immediate speculator) in a venture that is inhabitant in another economy (Coordinate venture endeavor). Remote direct venture, a noteworthy segment of universal capital streams, alludes to speculation by multinational organizations with headquarters in their home country.

Annaek (2007) characterizes foreign direct investment as the procedure whereby individuals in one nation acquire responsibility for with the end goal of picking up control over the creation, circulation and different exercises of a firm in a remote nation. Uzoka (2012) defined foreign direct investment as the inflow of outside salary into a specific economy through speculation which includes multinational enterprises. While Njeru (2013) likewise notes that FDI is the cross-fringe interest in which inhabitants in one economy (the immediate financial specialist) secures an enduring enthusiasm for an endeavor in another economy (the immediate speculation undertaking). World Bank (2004) characterizes FDI as the net inflows of venture to get an enduring administration premium (10 percent or a greater amount of voting stock) in an endeavor working in an economy other than that of the speculator. It is likewise the entirety of value capital, reinvestment of profit and other long haul. UNCTAD (2008) characterizes FDI as a long haul connection between organizations in the source nation (the speculator) and another organization in the host (nation of venture) alludes to a development of capital that includes proprietorship and control of a firm in another nation.

Bartels (2000) is of the supposition that FDI, in its temperament, is a worldwide record that reflects securing a durable enthusiasm by an inhabitant element of one nation into an occupant element of another nation. Outside direct speculation could go to the capital bringing in nation as an auxiliary of a remote firm. It could likewise drop by methods for arrangement of an organization in which a firm in the contributing organization has value holding or the production of settled resources in the other nation by the nationals of the contributing nation (Obadan, 2004). As indicated by Nwankwo (2006) FDI makes work and goes about as a vehicle of innovation exchange, gives prevalent abilities and administration strategies, encourages neighborhood firms' entrance to worldwide markets and expands item differing qualities. Ayanwale (2007) states that most nations endeavor to draw in FDI in light of its recognized favorable circumstances as a device of monetary improvement. In essence, FDI exists when a foreign organization or firm control specific offices

or generates income from a local firm over which it practices control successfully. Assembling FDI involves setting up creation offices in outside nations (e.g., Coca-Cola building offices in just about 200 countries). Said that the domestic economy of a nation can be supplemented by drawing in remote venture and by getting helps. Outside direct Speculation (FDI) is a venture made by an organization or individual in one nation in business interests in another nation, as either setting up business operations or securing business resources in the other nation, for example, possession or controlling interest for a remote organization. Remote venture can be arranged into two: portfolio and direct speculation.

2.2. Concept of Manufacturing Output

The industrial output is the total output of all the facilities producing goods within the country. The manufacturing output is the output of all factories in a country which is a sub-set of industrial output. Manufacturing production refers to the total production output from industries that consist of producing goods in factories or plants for a specific time period.

Manufacturing output is what an industry produces as a national total output. Manufacturing output is a pre-requisite for economic development. Industry is an impetus realized to satisfy the rapid growing demand for manufactured goods which developing nations could not maximally because of balance of payment difficulties. Manufacturing is a subset of the industrial sector (processing, quarrying, craft and mining).

Manufacturing is the processing segment of the industrial sector that involves the conversion of raw materials into finished consumer goods or intermediate/ producer goods. Manufacturing like other industrial activities creates avenue for employment, helps to boost agriculture and helps to diversify the economy while it helps the nation to increase its foreign exchange earnings, if the products were exported, thus helping local labour to develop skills. It minimizes the risk of over dependence on foreign trade and leads to optimum utilization of available resources. The degree of manufacturing is a measure of the extent to which the other components of the industrial sector are effectively utilized. Manufacturing turnover is the volume of goods produced and industrial services provided during the reference period at current prices. It is the income from sale of goods and provision of services, from which trade discounts, as well as value added tax and other taxes directly related to sales are deducted.

3. Theoretical Literature

3.1. New Growth Theory

The focal suggestion of new growth hypothesis is that, unlike land and capital, learning is not subject to consistent losses. New development hypothesis suggests two imperative focuses; initially, it sees mechanical advance as a result of monetary action. Furthermore, new growth hypothesis recommends that learning and innovation are portrayed by expanding returns, and these expanding returns drive the development procedure (Carkovic & Levine, 2002).

Subsequently, development is endogenous in new development hypothesis instead of exogenous as in old development hypothesis. Investment in human capital adds to expanding returns in the productivity and the more assets dedicated to innovative work, (McAleese, 2004). Also, the exchange of cutting edge innovation reinforces the host nation's current supply of learning through work preparing, aptitude securing, the presentation of option administration rehearses and hierarchical game plans. As an outcome, FDI expands efficiency in the beneficiary economy, and FDI can be esteemed to be an impetus for household speculation and innovative advance. FDI is expected to diminish the contrast between the coveted gross residential venture and household investment funds. Jenkins and Thomas (2002) state that FDI is required to add to monetary development by giving outside capital as well as by jamming in extra residential speculation. By advancing both forward and in reverse linkages with the local economy, extra business is by implication made and encourages monetary action animated.

Given the Nigerian economy asset base, the nations outside speculation approach should move towards pulling in and empowering more inflow of remote capital. The requirement for remote direct speculation (FDI) is conceived out of the immature idea of the nation's economy that basically thwarted the pace of her monetary improvement. By and large, approach procedures of the Nigerian government towards remote speculations are molded by two foremost destinations of the longing for monetary freedom and the interest for financial advancement. An examination of outside stream into the nation so far has uncovered that alone, a predetermined number of multinationals or their backups have made Remote Direct Interest in the nation. Added to this issue of inadequate inflow of FDI is the powerlessness to hold the remote direct speculation which has just come into the nation.

3.2. Theory of Internalization

Internationalization hypothesis was created by Buckley and Casson (1976) and Hennart (1982). This was because of market blemishes and firms seek to make utilization of their monopolistic leeway themselves. They recommended that organizations can beat the market defects by disguising their own particular markets. That implies, disguise includes a vertical coordination through bringing new operations and exercises under the administration of the firm and prior these exercises were completed by the middle of the road firms.

The hypothesis was initially suggested by Coase (1937) in a national setting and Hymer (1976) in a universal setting. Hymer recognized two noteworthy determinants of FDI, one is expulsion of rivalry and the other is favorable circumstances which a few firms have in a specific action (Denisia, 2010). Hymer (1976) set up two noteworthy determinants of FDI. The first were the favorable circumstances, which a few firms have in a specific movement while the second was the evacuation of rivalry. Buckley and Casson (1976) express that value-based organizations arrange their inside exercises to profit by particular points of interest, which are to be misused. The Internalization hypothesis lies on why organizations don't want to sign contract with a subcontractor in a remote nation as opposed to taking part in Foreign Direct Investment themselves. The hypothesis of disguise clarifies the inspirations of the value-based organizations for making outside direct speculation by exploiting different government monetary strategies and different arrangements.

3.3. Mercantilist Models Trade Theory

As indicated by Opusunju, Udo, and Jiya (2015) mercantilist gave the prior thought on worldwide exchange. To them, as indicated by the hypothesis, the most vital path for a country to be turned out to be rich and intense is to trade more than its import. Early contributions to mercantilism were Jean Baptiste Colbert and Thomas Hobbes. It was seen at that point, that, the most imperative thing was in which a nation could be rich was by getting valuable metals, for example, gold. This was accomplished by guaranteeing that the volume of exports was superior to the volume of imports. Exchange must be controlled, directed and limited. The nation was relied upon to accomplish good adjust of installment. Levies, amounts and other business arrangements were proposed by the mercantilism to limit imports so as to secure a country's exchange position. Mercantilism did not support unhindered commerce. Mercantilism confidence in an expression of contention in which the condition of nature was a condition of war and the requirement for direction to keep up arrange in human undertakings and financial issues were underestimating. To the mercantilist, the world riches was settled. A country's pick up from exchange was to the detriment of its exchanging accomplices that are, not all national could at the same time banquet from exchange.

3.4. Absolute Advantage Trade Theory

Adam Smith propounded the theory of total cost advantage in his acclaimed book. "Wealth of Nation" in 1776. The hypothesis rises because of the feedback required against mercantilism. He pushed facilitated commerce as the best arrangement for the countries of the world. Smith contended that with unhindered commerce every country could spend significant time in the generation of those wares in which it could deliver more effectiveness than alternative countries, and import those items in which it could create less proficiently (Opusunju et al., 2015). This worldwide specialization of production would bring about increment in world output, which would be shared by the exchanging countries. Along these lines a country require not pick up to the detriment of different countries, all countries could pick up at the same time (Opusunju et al., 2015).

4. Empirical Literature

Osisanwo (2013) analyzed the impact of foreign direct investment on manufacturing sector output growth in Nigeria between 1970 and 2011. He used econometric model and log of foreign direct invest (FDI), first lag of real manufacturing output level (MAN_{t-1}), degree of openness (OPEN), investment in human capital development (INV), and inflation rate (INF) in Nigeria during the review period. While, manufacturing output growth was proxied by real manufacturing output growth as the regress and. The ordinary least square (OLS) method was adopted and the result revealed that the first lag of real manufacturing output level (MAN_{t-1}) and inflation (INF) were significant factors influencing the growth rate of Nigerian manufacturing industry, while manufacturing output was insignificant and inelastic of foreign direct investment in Nigeria.

Ebekezien, Ugochukwu, and Okoye (2015) analysis on the inflow trends of Foreign Direct Investment investigated in the Nigerian construction industry with a view to studying the pattern of flow and assessing the effect of increased flow of FDI on the industry. Annual time series archival data from the central bank of Nigeria and the National Bureau of Statistics served were used. The data collected was analyzed using simple percentages, regression analysis, Duncan Multiple Range Test and causality Test. Results revealed that there is poor flow (or an insignificant flow) of FDI into construction sector when compared to other sectors of the economy. According to Granger test, the Granger Causality is bi-directional, suggesting that FDI is an important prerequisite and catalyst for sustainable growth and development in construction and on the other hand, the level of infrastructural facilities available on ground is a prerequisite for attracting foreign direct investors. A high positive correlation or significant relationship between FDI and the construction sector further confirm this result.

Okoli and Agu (2015) assessed the impact of foreign direct investment flow on the performance of the manufacturing firms in Nigeria using OLS and VECM to check for both short run and long run relationships. Using data from CBN Statistical Bulletin and National Bureau of Statistics spanning for the period of 40 years, the researchers found that FDI inflows has a long run impact on the manufacturing sector and therefore recommends that government should sustain and encourage policies that support FDI inflows into Nigeria especially in the manufacturing sector.

Aysha, Muhammad, and Sara (2011) examine the impact of foreign direct investment on manufacturing output growth during 2006-2010 and they used Dougherty model. Moreover, paired t-test was employed for comparison. Regression results show an insignificant impact of foreign direct investment on manufacturing output growth.

Patience (2011) examined the impact of foreign direct investment on manufacturing sector output growth of West Africa. The study was conducted across the Economic community of West African States (ECOWAS) which is the most popular regional economic community in Africa. Data was collected from banks annual reviews. It was found that foreign direct investment contributes to manufacturing output growth in West Africa.

Nkalu, Edeme, and Ifelumini (2016) analyzed development interventions, foreign capital inflows and growth in Nigerian economy while paying more attention on the effects of FDI on economic growth in Nigeria. The study utilized annual time-series data covering from 1970 to 2015 and sourced from the Central Bank of Nigeria (CBN) statistically bulletins. However, the result showed that FDI to Nigeria has a positive and statistically significant effects on economic growth.

Mounde (2017) examined the causal relationship between foreign direct investment and manufacturing output in Nigeria. Using the Industrial production as a proxy for manufacturing output, time series data was compiled from Central Bank of Nigeria and National Bureau of Statistics spanning of 36years, 1981-2016. The findings revealed that there is a long run relationship between foreign direct investment and output growth of the manufacturing sector in terms of industrial production. The error correction model was employed to determine the degree to which equilibrium behavior drives short run dynamics. Also granger causality test revealed that there exists bi-directional causality between them.

5. Methodology

The data used in this study come from secondary sources. The data generated are quantitative time series data on Manufacturing Sector Output, Foreign Direct Investment, Electricity Generation, Private Sector Credit, Investment proxied by Gross Fixed Capital Formation, Interest rate, Inflation, Exchange rate and Political Stability from the central bank of Nigeria publications, National Bureau of Statistics annual publications, World Development Indicators and World Governance Indicators for the period between 1970 and 2016.

5.1. Model Specification

To examine the impact of Foreign Direct Investment on manufacturing sector output growth in Nigeria, we adopt Unit root test, Co-integration test (using Error Correction Model), ordinary least square (OLS) approach and the granger causality test. The multiple linear regression analysis based on the classical regression methodology was the main procedure followed in this work. The OLS technique is chosen not only because of its computational simplicity but because it possesses some desirable statistical properties such as linearity, unbiasedness, minimum variance, zero mean value of the random term etc (Gujarati, 2005; Koutsoyiannis, 2003).

Although our study shall first ascertain the long run behavior of the variables of interest using unit root test.. The Augmented Dickey Fuller test shall be used for this exercise. The work reviewed the models used by various authors in the empirical literature section. This work therefore shall adopt the model used by some of the work reviewed. In this model MSOG is the dependent variable while the independent variables include Foreign Direct Investment (FDI), Private Sector Credit (PSC), Electricity Generation (ELECT_GEN), Domestic investment (proxied by Gross Fixed Capital formation), Exchange rate, interest rate, Inflation and Political Stability. These variables shall be used in the current work subject to stationarity. The model is as stated below:

$$MSOG = F (FDI, PSC, ELECT_GEN, EXCR, DINV, INTR, INFLA, POLSTA) \quad (1)$$

That is,

$$LMSOG = B_0 + B_1 LFDI + B_2 LPSC + B_3 LELECT_GEN + B_4 LEXCR + B_5 LINV + B_6 INTR + B_7 INFLA + B_8 POLSTA + U_t \quad (2)$$

where;

LMSOG= log of manufacturing sector output growth.

LPSC= log of Private Sector Credit.

LFDI= log of Foreign Direct Investment.

LELECT_GEN= log of Electricity generation.

LEXCR= log of exchange rate.

LINV= log of investment proxied by gross fixed capital formation.

INTR= Interest rate.

INFLA= Inflation.

POLSTA= Political stability.

Unit Root Test: Test of stationarity aimed at determining whether the variables have dependable means and variances. The Augmented Dickey-Fuller unit-root test was used to test whether the variables are stationary or non-stationary. Gujarati (2005) states that the essence of unit-root test is to avoid spurious regression and give accurate results.

Co-integration Test: Co-integration aimed at ascertaining whether there is long-run relationship between the variables.

Error Correction Mechanism (ECM): The purpose of error correction model is to indicate the speed of adjustment from the short-run equilibrium to the long-run equilibrium state. The greater the coefficients of the parameter, the higher the speed of adjustment of the model from the short run to the long-run equilibrium.

6. Results and Findings

In this section, the study analyzes the time series characteristics of the chosen variables for the period 1970-2016. The study undertook some econometrics tests on the variables of the model to ascertain their levels of stationarity and co-integration. Hence, the unit root test can be seen Figure 1.

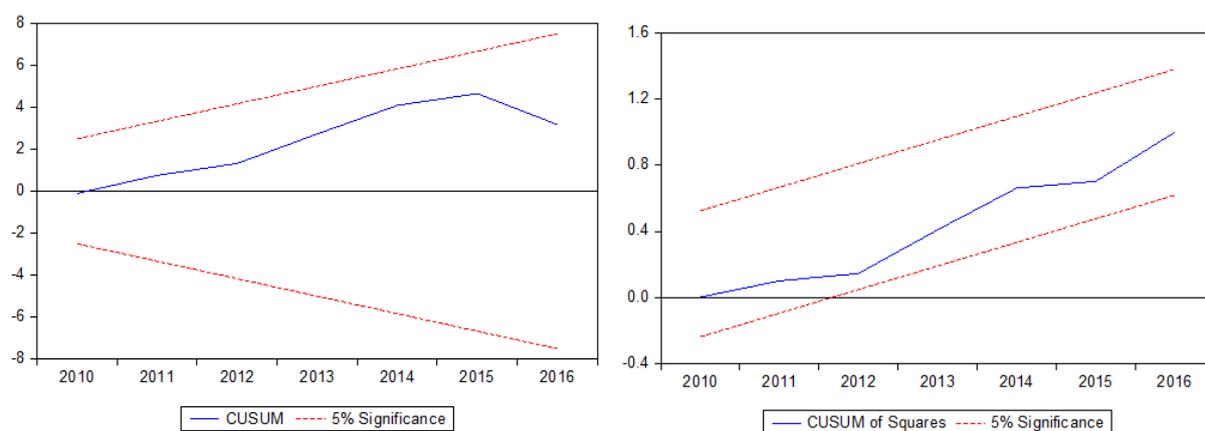


Figure-1. Model stability test results.

6.1. Unit Root Test

The augmented dickey-fuller (ADF) unit-root test was employed to test for stationarity of the variables of the model. The results of the unit-root tests are presented Table 1:

Table-1. Unit root results.

Augmented dickey-fuller unit root test

| Variable | ADF test statistic | 5% critical values | 10% critical values | Order of integration | Remark |
|------------|--------------------|--------------------|---------------------|----------------------|------------|
| LMSOG | -4.045501 | -2.928142 | -2.602225 | 1(1) | Stationary |
| INFLA | -3.810496 | -2.928142 | -2.602225 | 1(0) | Stationary |
| LINV | -6.533250 | -1.948313 | -1.612229 | 1(1) | Stationary |
| LELECT_GEN | -8.407591 | -3.510740 | -3.185512 | 1(0) | Stationary |
| LPSC | -5.572412 | -1.948313 | -1.612229 | 1(1) | Stationary |
| POLSTA | -10.08652 | -1.948313 | -1.612229 | 1(1) | Stationary |
| INTR | -7.608370 | -3.513075 | -3.186854 | 1(1) | Stationary |
| LEXCR | -5.294956 | -2.928142 | -2.602225 | 1(1) | Stationary |
| LFDI | -12.77035 | -1.948886 | -1.611932 | 1(1) | Stationary |

The above empirical test shows that LMSOG, LINV, LEXCR, LPSC, POLSTA, INTR and LFDI are integrated of the same order, order 1(1) while INFLA and LELECT_GEN are both integrated of under (0).

6.2. Co-Integration Test

Table-2. Co-Integration results.

| Variable | Coefficient | Std. error | t-statistic | Prob. |
|----------------|-------------|------------|-------------|--------|
| U _t | -0.480872 | 0.132644 | -3.625279 | 0.0008 |

From Table 2, the probability value of the residual shows that the variables are co-integrated. The implication is that Error correction model would be conducted in order to ascertain the speed of adjustment from short-run equilibrium to long-run equilibrium.

7. Error Correction Model

Table-3. Error correction result.

Dependent variable: LMSOG

| Variable | Coefficient | Std. error | t-statistic | Prob. |
|------------|-------------|------------|-------------|--------|
| C | -14.24808 | 2.989589 | -4765900 | 0.0000 |
| LELECT_GEN | 0.753696 | 0.347331 | 2.169966 | 0.0371 |
| LFDI | 0.025123 | 0.136936 | 0.183462 | 0.8555 |
| LEXCR | 0.847543 | 0.089979 | 9.419363 | 0.0000 |
| INTR | -0.026272 | 0.020631 | -1.273426 | 0.2115 |
| INFLA | -0.005232 | 0.004327 | -1.209205 | 0.2883 |
| POLSTA | -0.3533337 | 0.327533 | -1.078781 | 0.2883 |
| LPSC | 1.641739 | 0.203016 | 8.086732 | 0.0000 |
| LINV | 0.111948 | 0.082305 | 1.360161 | 0.1827 |
| ECM(-) | 0.719876 | 0.156982 | 4.585712 | 0.0001 |

R-squared = 0.987163, Adjusted R-squared = 0.983765, F-statistic = 290.5164, Prob(F-statistic) = 0.000000, Durbin-Watson stat = 1.741595.

7.1. The Long Run Model

The existence of co-integration necessitated the application of Error Correction Model in the study. In order to absolve the short run fluctuations, an attempt was made to apply the Long run model based on Ordinary Least Square (OLS). Hence, the results of the long run model are given thus:

Table-4. OLS result.

Dependent variable: LMSOG

| Variable | Coefficient | Std. error | t-statistic | Prob. |
|------------|-------------|------------|-------------|--------|
| C | -12.36132 | 3.526452 | -3.505315 | 0.0012 |
| LELECT_GEN | 0.158640 | 0.252433 | 0.628444 | 0.5336 |
| LFDI | -0.064311 | 0.164014 | -0.392109 | 0.6972 |
| LEXCR | 0.724344 | 0.101811 | 7.114602 | 0.0000 |
| INTR | 0.019916 | 0.021190 | 0.939882 | 0.3534 |
| INFLA | -0.009568 | 0.004991 | -1.917157 | 0.0630 |
| LPSC | 1.771883 | 0.238186 | 7.439064 | 0.0000 |
| POLSTA | -1.034498 | 0.357946 | -2.890092 | 0.0064 |
| LINV | 0.127605 | 0.100805 | 1.265855 | 0.2135 |

R-squared = 0.980084, Adjusted R-squared = 0.975777, F-statistic = 227.5955, Prob. (F-statistic) = 0.000000, Durbin-Watson stat = 0.976658.

The results from the long run model are quite revealing. That is, some of the coefficient estimates of the explanatory variables have alternated their signs as against the long-run relationship found in the Error Correction Result in Table 3. This shows exactly what is needed to be done in order to resolve the short-run dynamics of relationships. Again, the significance of OLS holds that a negative and statistically significant error correction model coefficient is a necessary condition for the variables to be co-integrated as seen in Table 2. The study also observed from Table 3 that the speed of adjustment from short-run to long-run equilibrium is 72% approximately.

7.2. Granger Causality Test

This is a test performed on two variables to ascertain the direction of causality between them. The number two objective of this work is to ascertain the direction of causality between foreign direct investment (LFDI) and manufacturing sector output growth (LMSOG). This was done using Pairwise Granger causality test as seen below:

Table-5. Pairwise granger causality result.

| Null hypothesis | Obs. | F-statistic | Prob. |
|-----------------------------------|------|-------------|--------|
| LFDI does not Granger cause LMSOG | 42 | 7.13261 | 0.0024 |
| LMSOG does not Granger cause LFDI | | 0.41726 | 0.6619 |

8. Discussion of Findings

This work sought to find out the impact of Foreign Direct Investment inflows on the manufacturing sector output growth in Nigeria from 1970-2016. After performing econometric tests of Unit root and co-

integration and Granger causality on the variables, and applying the long run and Error correction models based on Ordinary least square technique, the following results were obtained:

From [Table 1](#), two out of Nine variables were stationary at level while the remaining seven were stationary at order one (that is at first difference) using ADF Unit root test. This means that those variables that were stationary at level had no unit root problem while those that were stationary at order one had unit root problem at level before they were differenced to achieve stationarity. This was done to avoid spurious results. There exists a long-run equilibrium relationship between Foreign Direct Investment and manufacturing sector output growth in Nigeria. This was achieved through the use of co-integration test.

[Table 3](#) shows the short-run (Error correction) model of the regression while [Table 4](#) shows the long-run OLS regression result. Comparing the two tables, in the short-run, LFDI is positive and while in the long-run, it is negative and statistically insignificant at 5% level of significance. This means that a 1% increase in FDI brings about on average 2.5% increase in the manufacturing sector output growth but in the long run, it decreases it by 6.4%.

The Adjusted $R^2 = 0.987163$ shows that 98.716 % of the total variation in the manufacturing sector output growth (MSOG) is accounted for by the explanatory variable in the short-run while in the long-run, a 1% increase in FDI, on the average will lead to 6% decrease in the manufacturing sector output growth at 5% level with the Adjusted $R^2 = 0.97577$ which account for 97% variation in MSOG that is explained by the explanatory variable. Electricity generation (LELECT_GEN) in the short-run shows a positive and statistically significant result meaning that a 1% increase in electricity generation, on the average, will lead to 75% increase on the manufacturing sector output growth in Nigeria while in the long-run, a 1% increase in LEELCT_GEN, on the average, will lead to 16% increase in the manufacturing sector output growth at 5% level of significance. The implication is that when there is steady electricity generation in the short-run, it contributes more to manufacturing sector output growth than in the long-run. This result shows that electricity generation is the life wire or a major determinant in the manufacturing sector output growth in Nigeria both in the short-run and long-run. This is the most interesting findings of this research work.

Investment (proxied by Gross fixed capital formation) shows a positive and statistically insignificant result in the short-run while in the long-run, LINV is also positive and insignificant at 5% level. This means that a 1% increase in investment, on the average, will lead to 11% increase in the manufacturing sector output growth while in the long-run, a 1% increase in investment, on the average, will lead to 13% increase in the manufacturing sector output growth. This implies that since investment is a long term project, it tends to have more effect on the manufacturing sector output growth than in the short-run.

In the short-run, Exchange rate (LEXCR) shows a positive and statistically significant result meaning that a 1% increase in exchange rate, on the average, will lead to 85% increase in manufacturing sector output growth while in the long-run, a 1% increase in Exchange rate (LEXCR), on the average, will lead to 72% increase in the manufacturing sector output growth in Nigeria.

In the short-run, Interest rate (INTR) and Inflation (INFLA) both conform to a priori expectation of negative coefficients though both are statistically insignificant at 5% level of significance. This shows that a 1% increase in both variables, on the average, will lead to 2.6% and 1% decrease in the manufacturing sector output growth respectively while in the long-run, only Inflation (INFLA) conform to a priori expectation of negative coefficient though statistically insignificant while interest rate has a positive coefficient though statistically insignificant at 5% level. The implication is that in the short-run, both INTR and INLFA tend to be stable while in the long-run, they tend to be unstable.

Another variable of interest is Political Stability (POLSTA) which in the short-run shows that a 1% increase in political stability, on the average, will lead to 35% decrease in the manufacturing sector output growth at 5% level of significance. Its coefficient shows that political instability contribute to low growth of the manufacturing sector in the short-run though not significantly (that is, there has been no political stability within the study period which accounted for 35% decrease in the MSOG). While in the long-run, POLSTA is negative but significant showing that when there is political instability, it will contribute significantly to the low growth of the manufacturing sector within the study period. That is, a 1% increase in POLSTA will lead to 103% decrease in the manufacturing sector output growth. This has been a major problem that Nigeria is facing over the past years as foreign investors keep depleting or withdrawing their investment portfolios day by day to safer countries with less or no political instability.

Finally, the Private Sector Credit (LPSC) result shows that it is positive and statistically significant at 5% level in the short-run while in the long-run, the same result was achieved. This means that a 1% increase in LPSC, on the average, will lead to 164% increase in the manufacturing sector output growth while in the long-run, a 1% increase in LPSC, on the average, will lead to 177% increase in the MSO. This also conform to a priori expectation. This signifies that PSC is a very important variable in this model both in the short-run and long-run as it will help greatly in the growth of the manufacturing sector in Nigeria.

The ECM result shows that the speed of adjustment is 72%. It is positive and statistically insignificant. The implication is that 72% of the errors in the long run are accounted for in the short run annually.

Granger causality test in [Table 5](#) shows that there is a unidirectional causality between FDI and MSOG. That is, FDI granger cause MSOG while MSOG does not granger cause FDI.

9. Conclusion and Recommendations

In a bid to attract larger share of global FDI into the manufacturing sector for the purpose of diversifying the economy from crude oil, Nigeria has to strive more to restore macroeconomic stability, address the investor concerns of risk and improve the overall investment climate. Promotion of FDI in Nigeria should be undertaken as a comprehensive task, Nigeria should address the issue of economic and political instability, develop local financial markets to ease access to finance by investors and also improve the economy's ability to take advantage of the potential benefits of FDI. This study further establishes that the consensus in the literature appears to be that FDI is positively correlated with manufacturing sector output growth though statistically insignificant because it acts as a conduit for transferring advanced technology from the industrialized countries to the developing economies like Nigeria. This study therefore recommends the following:

1. The government should increase her capital expenditure on the power sector and ensure efficient management of this expenditure so as to ensure increased electricity generation for greater growth and efficiency of the manufacturing sector.
2. That Nigeria should develop her capital and financial markets in order to ensure availability of venture capital and long term finance or loan. Developed financial sector (both money and capital market) will enhance the capacity of host countries to take advantage of the spill over effects and this can be shown by the high coefficient and significance level of PSC which represents the amount of money available to investors to access.
3. The government through the Central Bank of Nigeria and other regulatory bodies should try as much as possible to minimize the exchange rate volatility or fluctuations and ensure availability of foreign currencies in the country for foreign investments. Exchange rate stability will help stabilize the Nigerian currency against other currencies of the world which will in turn create value for the country's currency.
4. Political stability should be maintained for efficient and effective inflows of FDI and domestic investment. As we all know, political instability of a country scares people away especially the foreign and local investors as their investment will be insecure in both present and future period. This endangers both their lives and the money invested thereby discourages investors from investing leading to low growth in the manufacturing sector. Therefore, Government should enact and implement policies that are geared towards bringing political stability to the country.
5. Finally, that the Government should encourage FDI inflow into the country for it serves as a conduit for the transfer of technology, machines, knowledge and skills from industrialized to developing countries' manufacturing sector which will lead to the growth and diversification of the Nigerian economy. More so, the importance of FDI inflow in the growth of the manufacturing sector is seen from the Granger causality test which shows unidirectional causation from FDI to MSOG meaning that, FDI granger causes MSOG.

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