EFFECT OF FOREIGN DIRECT INVESTMENT ON MANUFACTURING SECTOR OUTPUT IN NIGERIA, 1981–2020

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ABSTRACT

This study is an analysis of the effect of Foreign Direct Investment (FDI) on manufacturing sector output in Nigeria. The motivation for this study is drawn from Nigeria's dependence on external intervention which has created macroeconomic instability in inflation rate, exchange rate and unemployment rate. The aim is to estimate the impact of these variables on manufacturing output. Secondary data were sourced from various issues of the Central Bank of Nigeria (CBN) Statistical Bulletin. The study used the autoregressive distributed lag model (ARDL) estimation technique to evaluate the causality between the dependent variable (manufacturing output) and the independent variable (FDI). The findings revealed that Foreign Direct Investment (FDI) and Gross Fixed Capital Formation (GFCF) have positive impact on manufacturing output both in the short and long run, while unemployment rate, interest rate and inflation rate have negative and significant impact on manufacturing output in Nigeria. The study concluded that FDI and GFCF have significant impact on manufacturing output in Nigeria both in short and long run. It, therefore, recommends that government policy should be concentrated on promoting ease of doing business as a means of attracting foreign direct investment. Gross Fixed Capital Formation should be promoted. Also, monetary and fiscal policies in relation to interest rate, exchange rate and inflation rate should be professionally managed, devoid of politics to facilitate manufacturing sector performance in Nigeria.

Keywords: Manufacturing output, Foreign Direct Investment Absorptive Capacity, Unemployment and Exchange Rate.
JEL Classification: C50, E45, B80, D82

INTRODUCTION

The manufacturing subsector is the most dynamic part of the industrial sector and without it, industrial development is impossible for any nation. This means that the sector is one of the major determinants of a developed economy. In agreement with

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this assertion, it has been argued that the fastest way through which rapid growth and sustainable development can be achieved in any economy is through industrial capacity, technological innovation and enterprise development (Olamode, Oyebisi & Olamode, 2014). It has also been observed that industrialisation accounts for 60 per cent of the world's wealth, and facilitates 35 percent of trade and commerce, only 5 per cent of trade to other sectors (Mai-Lafia, 2016). These statistics clearly underscore the importance of the industrial and manufacturing sectors in contemporary world economy. The industrial sector represents a transition between traditional agriculture and modern service sector. This has been demonstrated in England during the industrial revolution, the United States of America as the world's leading economy in manufacturing, China, Japan, India, Germany etc,

Manufacturing is the most vibrant subsector of the industrial sector, and it is recognised as the engine of economic growth in developed and emerging economies (Ndebbio, 1987, Ududechinyere, Eze & Nweke, 2018; Simbo, Iwuji, & Bagshaw, 2012; Soderborn & Teal, 2002). This submission is also evident in the report of Congressional Research Service (2018) and World Bank (1985). Audretsch (2018) indicated that in 2015, developed countries' manufacturing contributions to GDP were 22 percent in Germany, 19 percent in Japan, 12 percent in US, 10 percent in UK; while in emerging economies, South Korea's manufacturing contributed 29 percent; China, 27 percent; Indonesia, 22 percent, Brazil, 11 percent; this is an indication that manufacturing is being promoted all over the world. Earlier, a similar report was presented by the World Bank which indicated that manufacturing contributes 20 percent of GDP in Brazil, 35 percent in Thailand, 34 percent in China, 30 percent in Malaysia and 28 percent in Indonesia (Ogbu, 2012 in Udulechinyere, Eze & Nweke, 2018). However, while manufacturing contributed substantially, it is observed that this dynamic industrial subsector is very weak in developing economies (Landry and Chelsea, 2018; Thirlwall, 2003). In particular, most African countries have shown poor performance in manufacturing output even though the continent has made some improvement in the subsector's output, generally.

In Africa, manufacturing has grown 3.5 percent annually from 2005 to 2014 (Landry & Chelsea, 2018) with some countries experiencing output of over 10 percent (Balchin Kennan, Martin, Dirk, William, 2016; KPMG, 2015). For instance, Morocco's manufacturing accounts for 15 percent of GDP and 10 percent of formal employment; in Kenya, 20 percent of GDP and 12.5 percent of formal jobs while in Nigeria, 9 percent of GDP (Landry & Chelsea, 2018). Others are South Africa with 13.2 percent (Industrial Development Corporation [IDC], 2019); Mauritius, 13.1 percent and also employing 97,000 workers (Benard, 2019). For a developing country like Nigeria, manufacturing seems to hold the key to improved industrial output. However, a more disturbing report from Ehijiele, Sunday and Nurudeen (2016) noted that manufacturing production in Nigeria decreased 0.3% in June of

2015 and then by the third quarter of 2015 the output had dropped to as low as -0.70%. Therefore, Nigeria's manufacturing seems to have the least contribution to GDP among developing economies mentioned above. The performance signals loss of focus on goal four of the country's vision 2020:20 which envisioned an economy that is strong and diversified with a globally competitive manufacturing that will be highly integrated and contributing not less than 25 % to the GDP (Bature, 2013).

One of the major factors which accounts for the discrepancies in the levels of output of manufacturing in developed, emerging and developing countries has been found to be variation in the levels of investment. In order to attract foreign direct investments (FDI), most developing economies in Latin- America and Sub-Saharan Africa in the 1980s resorted to the neoliberal policy reforms which were believed to be triggers (Adejumo, 2013). In Africa for instance, the New Partnership for African Development (NEPAD) among other reasons was deliberately established to attract FDI of USD 64 billion into the continent (Funke & Nsoula, 2003). Consequently, while FDI flows across the globe fell by 19 percent and 40 percent in developed countries, it increased by 3.1 percent in Africa with 5.8 percent rise in certain regions of the continent in 2016 (UNCTAD, 2016). In Africa, it is observed that the attention of investors is concentrated on three countries, namely, South Africa, Kenya and Nigeria which account for 40 percent of FDI projects (EY Survey, 2014 as cited by Ehijiele, Sunday & Nurudeen, 2016).

Manufacturing has been noted to be amongst other sectors like agriculture, forestry, fishing, construction and services which are yet to attract commensurate investment in Nigeria (Etienna & Charles, 2017; Benard, Barnabas & Edgar, 2015; Tybout, 2000). High- and middle-income economies are observed to have devoted about 20 to 40 per cent of their resources to industrial activities which manufacturing is an integral part (Thirlwall, 2003). This huge investment by high- and middle-income economies is necessary to take care of high managerial skills requirement, technology and innovation, as well as R&D, which are critical to manufacturing productivity (Rodrik, 2014; Olamide, Oyebisi & Olabode, 2014). The huge investment is also responsible for the growth in the share of manufacturing to real GDP which is reported to have increased globally from 14.8 to 16 per cent between 1991 and 2014 (United Nations Industrial Development Organization [UNIDO], 2017).

Nigeria's absorptive capacity to attract FDI into the manufacturing sector is weak. This is confirmed by the enabling environment and inconsistent GDP growth rate where FDI stood at 0.51 percent of GDP in 2019 and 2.94 percent in 2020 (UNCTAD, 2022). The nexus between FDI and manufacturing lies in the role of capital as an essential input of industrial production. Attracting FDI into manufacturing seems to have potentials for developing the sector, job creation and

revenue diversification. Nigeria like most developing countries where capital formation is low, has depended on external interventions in terms of FDI to bridge the huge investment gap required for manufacturing to thrive (Bennet & Anyanwu, 2015; Akinmulegun & Oluwole, 2014). This implies that FDI measure is a complementary investment to bridge the domestic investment deficits in manufacturing. The choice of FDI is also predicated on the assumption that, unlike debt which has repayment period and aid flows which is not predictable (De Gregorio, 2003), FDI is more resilient in terms of employment generation, high productivity, competitiveness and technology spillover (Adejumo, 2013; Denisa, 2010; Caves, 1996).

The Structural Adjustment Programme (SAP) which was adopted in 1986 with other sundry initiatives like the Ease of Doing Business (EDB) were introduced as part of the grand plan to attract FDI into the country. The report of Imoudu (2012) indicated that although FDI in Nigeria was traditionally concentrated in the extractive industries, manufacturing and processing sub-sectors had received tremendous attention within the period 1980 to 2009. This observation corroborated the views expressed by Obanje, Okwu and Saror (2010). The trend of growth of FDI to the country indicated that from 38.3 percent between 1980 and 1984, it rose to 47.7 percent between 1990 to 1994; dropped sharply to 26.6 percent between 1995 and 1999 but eventually rose to 40.7 percent between 2005 and 2009 (Ehijiele, Sunday & Nurudeen, 2016). A similar report by the Central Bank of Nigeria (2012) indicated that the amount of FDI inflow to Nigeria rose from USD2.69 billion in 2003 to USD4.44 billion in 2004 and rose further to USD5.08 billion in 2009. Therefore, 2009 was a defining moment in the history of FDI in Nigeria. It is curious however to note that given the quantum of FDI received in the country, manufacturing output as share of GDP is infinitesimally low.

The weak performance of Nigeria's manufacturing output has raised fundamental concern as to whether FDI has any positive impact on manufacturing output in Nigeria; hence, the need to investigate the impact with the view to proffer solutions. This is necessary because weak manufacturing has serious implications for macroeconomic indicators such as exchange rate, employment, poverty reduction, food security, balance of payment, inflation rates etc. which are fuelling instability. Manufacturing sector's performance seems to have effects on macroeconomic indicators as official statistics indicated that Nigeria's GDP was as low as 1.9 percent in 2018, unemployment rate was as high as 23.1 (NBS, 2018); inflation rate was 11.08 percent (NBS, 2019); by 2024, inflation rate had reached all-time high of 34.6 percent (NBS, 2024). Nigeria topped the world's poverty chart with 86. 9 million people living below the poverty line, followed by Democratic Republic of Congo which had 60.9 million (United Nation, 2018); official interest rate hovered around double-digit high 17.2 percent between 1999 and 2018 (Kneoma, 2018).

This high interest rate is constraint to manufacturers and cottage industries. The sign of food insecurity in Nigeria is a limiting factor to industrial raw material as reflected in the report of Uche (2019) who cited the then vice president of Nigeria, Osibanjo as lamenting that in 2016 alone, Nigeria spent $965m on the importation of wheat, $39.7m on rice, $100.2m on sugar and $655m on fish. With the country's population increasing rapidly at about 3 percent and projected to be 400 million in 2050 these problems of external dependence may worsen, hence the need for self-reliance industrialisation and manufacturing with local content.

LITERATURE REVIEW

Conceptual Review

This study conceptualised manufacturing output as well as foreign direct investment in the context of the topic.

Concept of Manufacturing Output

The World Bank defines the industrial sector as "the part of an economy that is involved in the manufacturing of goods" (World Bank, 2020). World Bank emphasises manufacturing aspect of the industrial sector, highlighting its role in transforming raw materials and inputs into finished products. The word manufacturing, derived from the Latin word "manufactus" means made by hand. Today however, various scholars have perceived the concept differently. Sam (2005) conceived that manufacturing or production is the process of adding value to a material using man and machine. A similar perception is held by Rajender (2006) who perceived manufacturing to involve making products from raw materials by using various hand tools, machinery or even computers. Therefore, this study conceptualised manufacturing output as output resulting from manufacturing activities of the Nigerian economy measured as percentage of Gross Domestic Product (GDP).

Concept of Foreign Direct Investment (FDI)

Many attempts have been made to conceptualise FDI in economic literature. The World Investment Report (2007) viewed it as a balance-of-payment concept involving the cross-border transfer of funds. This view is vague because it did not clearly highlight the source and where the transferred fund it mentioned goes to. However, the report cited OECD (1996) and International Monetary [IMF] (1993) which provided a more vivid conception that FDI is an investment involving a long-term relationship and reflecting a lasting interest and control by a foreign investor (s) in an economy other than their own. Therefore, this study conceptualised FDI as portfolio investments by Multinational Corporations (MNCs) in Nigeria by nationals of other countries.

Theoretical Review

This study is based on the framework of investment acceleration theory, spillover theory and the big push hypothesis.

The Investment Acceleration Theory

One of the scholars to whom this theory is credited to was Clarke (1923) when he published his book *The Business of Overhead Costs*. It was meant to be a microeconomic theory but subsequently became a tool for macroeconomic analysis in many studies (Fergurson, 1960). The theory assumes that a discrepancy between desired and actual capital stock is eliminated within a single period. In its simplest form, the theory was based on the notion that capital stock is necessary to produce a given output. The idea is that countries with capital formation deficits like Nigeria could leverage FDI to bridge the gap. The theory is significant to this study in observing the role of investment.

The Spillover Theory

This theory was first developed by Marshal (1920) in the book *Principles of Economics* where his popular knowledge spillover featured. The spillover theory was later extended, hence the new nomenclature MAR spillover by other scholars including Arrow and Romer (1990). The theory was predicated on the assumption that locations featured by similar economic activities generate valuable concentration (agglomeration) economies of scale for firms namely: better access to skilled labour and knowledge spillover from competing firms. In other words, the concentration of firms in the same industry in a city helps knowledge travel among firms and facilitates innovation and growth. Consequently, convergence of firms has the potential to generate positive externalities such as employment generation, increased productivity, competitiveness, innovations, etc (Denisia, 2010; Gerald, 2001).

The theory has been criticised; for example, the ability to internalise positive externalities is not automatic (Alcacer & Chung 2010; Alcacer & Chung, 2007). However, the criticisms are not weighty enough to invalidate the theory. Therefore, this study is anchored on the **investment acceleration theory** and the **spillover theory**. These two theories bring out clearly the link between FDI and manufacturing sector development, securing foreign capital/finance that will help grow Nigeria's investment in the manufacturing sector. In this approach, Nigerian entrepreneurs will acquire the knowledge and skills required for modern production through technology transfer. This will require that we develop local capacities in product design, process engineering, equipment design and fabrication. Through FDI, local manufacturers can design, install, operate and then manage the

production system necessary for expanded production, economic growth and sustainable development.

Empirical Review

Ebele, Chimaobi and Agu (2024) conducted a study that explores the effect of FDI on growth trajectory of the manufacturing sector in Sub-Saharan Africa. The research employed the panel autoregressive distributed lag (ARDL) estimation technique on data from 1985 to 2021. The results found that FDI positively impacts the manufacturing sector's growth in the long run. The study in its recommendation underscores the need for policies that enhance the investment climate in Sub-Saharan Africa.

Ojo et. al (2023) carried out a study that was specifically focused on the manufacturing subsector in Nigeria (1981-2019). The data were sourced from World Bank Development Indicators. The variables included manufacturing output, FDI, interest rate, exchange rate and inflation rate. ARDL method was used for estimation. The findings showed that FDI exerts a negative and significant impact on manufacturing output in Nigeria. The major recommendation was the use of fiscal policy to discourage the flow of FDI to the manufacturing subsector, except for those with essential FDI.

Azolibe (2021) in his study estimated how FDI influence manufacturing sector growth in the Middle East and North Africa (MENA). The study employed Panel Unit Root Test and Dynamic OLS, using panel data for 18 countries covering the period 1975 to 2017. The findings show that FDI has a negative impact on the productivity of manufacturing firms. The study recommended that MENA countries should concentrate more on making policies that will encourage effective utilisation of domestic resources. It is only on this condition that FDI will have the capacity to boost the manufacturing sector growth.

Olusanya (2020) investigated the asymmetric effect of FDI on manufacturing sector performance in Nigeria. The study used non-linear ARDL method to estimate co-integration between FDI and manufacturing sector growth. The error correction model was also employed. The findings showed a positive FDI to improve the manufacturing sector growth by 0.25 percent for every 1 percent increase in FDI. The major recommendation was that government should provide infrastructures and consistent regulations of the manufacturing sector to curb corruption and provide solid ground for private investors in the Nigerian manufacturing sector.

Pazienza (2019) researched on the impact of FDI in the OECD manufacturing sector on carbon dioxide (CO_2) emission: evidence and policy issues. The aim was to develop an analysis to primarily understand how and with what magnitude FDI impacts on the environment. Data were gathered for 30 OECD countries from 1989

to 2016. The empirical analysis was developed by using STATA 14 software. The model was tested for heteroskedasticity, autocorrelation and stationarity. It was found that as the scale of FDI increases, the level of CO_2 from fuel burning decreases, and that FDI is a transfer of technology innovation allowing cleaner production modes. The study recommended more FDI to the OECD.

Adegbami (2018) examined the relationship between macroeconomic dynamics and manufacturing output in Nigeria using co-integration test technique after the unit roots revealed stationarity of the time series data at first difference. The findings indicated no short run relationship among manufacturing output and each of GDP, exchange rate, inflation rate, and broad money supply, while negative relationship existed among inflation rate, interest rate, exchange rate, broad money supply and manufacturing. Inflation rate and interest rates were statistically insignificant while significant and positive relationship existed between GDP of previous year and unemployment as well as manufacturing. The study therefore recommended the harmonisation of both fiscal and monetary policies to attain macroeconomic stability. The post estimation test found the presence of serial correlation and heteroscedasticity.

Orji, Anthony-Orji, Johnson and Okafor (2015) investigated the impact of FDI on manufacturing output using linear regression model between 1970 and 2010. The study found that FDI impacted negatively on manufacturing. The study recommended competitive policies by government to ensure proper functioning of markets necessary to attract FDI into the country.

Adejumo (2013) examined the relationship between FDI and manufacturing sector performance in Nigeria between 1970 and 2009, employing Autoregressive Distributed Lag (ARDL) technique. The study found that in the long run, FDI has negative impact on manufacturing value added within the period.

Charles (2012) investigated the performance of monetary policy (MP) on manufacturing sector in Nigeria between 1980 and 2009. The study adopted Vector Error Correction (VEC) and Ordinary Least squares estimations with manufacturing output as the dependent variable, and money supply (MS) as the independent variable. The study found that MS positively impacted the index of manufacturing output within the period of analysis. The study therefore recommended expansionary monetary policy in Nigeria.

Loto (2012) embarked on a study of global economic downturn and the manufacturing sector performance in the Nigerian economy from 2005Q1 to 2008Q4 (pooled data). Both descriptive and Error Correction Model (ECM) were employed and the model for the study had capacity utilisation rate (CU), inflation rate (INF), lending rate (LR), exchange Rate (EXCR), FDI, import (IMP) and

export (EXP) as explanatory variables which were regressed on manufacturing (MGDP) as the dependent variable (DV). The Augmented Dickey-Fuller Unit root test was carried out for all the variables used in the study with INF, LR, and EXCR being stationary after second difference, I(2), while IMP and FDI were stationary at first difference, I(1). The regression result indicated a positive but insignificant shock on the manufacturing performance except FDI which had significant but negative impact on the sector's performance. A careful review indicated that the variables attained stationarity after first and second difference.

Adejumo (2013) posited that in the 1970s, when Nigeria's FDI was negative and government was investing hugely in manufacturing, the manufacturing value added (another indicator of manufacturing performance) was growing at 4.5 percent in Nigeria. However, the sector has received positive FDI, and better manufacturing output is expected in line with both theoretical and empirical postulations of FDI, but this is not the case. Scholars like Denisa (2010) and Hanson (2010) have doubted the possibility of FDI improving productivity in Nigeria's manufacturing sector, citing the crowding-out of local enterprise with little local content value-added. Therefore, the debate surrounding the impact of FDI is curious, inconclusive and relevant, given the costly business environment, exchange rate difficulty, inflation rate and macroeconomic instability that are obviously impacting on manufacturing performance in Nigeria. These are the motivations for the current study.

Research Gap

The conceptual and empirical literature review have confirmed that many studies have been conducted in this no-grey area. However, most of the studies seem to differ or default in the choice of variables, appropriate technique of analysis or time series of analysis. For instance, the study by Azolibe (2021) and Ojo et al. (2023) found that FDI has negative impact on manufacturing sector growth, while Ebele, Chimaobi and Agu (2024), Olusanya (2020) found that FDI has positive effect on manufacturing sector performance. Most of these empirical literatures reviewed also mentioned that FDI has possibilities of impacting employment in the receiving country, but none of these studies captured unemployment rate as a variable in their estimation which this current study has done. Therefore, this current study is an addition to the body of knowledge in methodology, methods, variables and techniques of analysis. Also, the period covered by this study is an updated version that captures the current macroeconomic and business environment challenges facing FDI and manufacturing sector in Nigeria.

METHODOLOGY

This study is based on experimental research design. It relied on secondary data sourced from the Central Bank of Nigeria (CBN) Statistical Bulletin, Various Issues for the period 1981- 2020. The regression technique adopted was ARDL. The variables are manufacturing output (dependent variable) and independent variables (foreign direct investment, interest rate, inflation rate, exchange rate, gross fixed capital formation). The use of ARDL was justified by the mixed order of integration obtained from the unit root test of I(0) and I(1) level of stationarity.

Model Specification

The model for analysis is anchored on investment and spillover theories and is specified thus:

$$MOUPUT = f(FDI, GFCF, INTR, EXCR, INFR, UEMR) \quad (1)$$

Where:
$MOUPUT =$ Manufacturing output
$FDI =$ Foreign direct investment to manufacturing
$GFCF =$ Gross fixed capital formation
$EXCR =$ Exchange rate
$INTR =$ Interest rate
$INFR =$ Inflation rate
$UEMR =$ Unemployment rate
$U_t =$ Stochastic term

Therefore, the econometric model becomes:

$$MOUPUT = \beta_0 + \beta_1 FDIMS + \beta_2 GFCF - \beta_3 INTR - \beta_4 EXCR - \beta_5 INFR - \beta_6 UNEMR + U_t \quad (2)$$

The *a priori* expectations: $\beta_1 - \beta_2 > 0$; $\beta_3 - \beta_6 < 0$.

Since the variables are not in the same unit of measurement, the natural log of the model was taken to bring all the variables to a common base of measurement.

$$LogMOUPUT = Log\beta_0 + \beta_1 LogFDIM + \beta_2 LogGFCF - \beta_3 LogINTR - \beta_4 LogEXCR - \beta_5 LogINFR - \beta_6 LogUNEMR + U_t \quad (3)$$

The general form of the ARDL is represented thus:

$$y_t = \alpha + \sum \gamma_i y_{t-i} + \sum\sum X_{j\,t-i}{}' \beta_{j,i} + \epsilon_t \quad (4)$$

ARDL includes the lag of the dependent variable as part of the explanatory variable automatically, thereby transforming our behavioural equation (equation 1) to the ARDL form below:

$$\Delta LOG(MOUPUT)_t = \beta_0 + \beta_1 \Delta LOG(MOUPUT)_{t-1} + \beta_2 \Delta LOG(EXCH)_{t-1} + \beta_3 \Delta LOG(FDI)_{t-1} + \beta_4 \Delta LOG(GFCF)_{t-1} - \beta_5 \Delta LOG(INFR)_{t-1} - \beta_6 \Delta LOG(INTR)_{t-1} - \beta_7 \Delta LOG(UEMR)_{t-1} + \sum \beta_8 \Delta LOG(MOUPUT)_{t-1} + \sum \beta_9 \Delta LOG(EXCH)_{t-1} + \sum \beta_{10} \Delta LOG(FDI)_{t-1} + \sum \beta_{11} \Delta LOG(GFCF)_{t-1} + \sum \beta_{12} \Delta LOG(INFR)_{t-1} + \sum \beta_{13} \Delta LOG(INTR)_{t-1} + \sum \beta_{14} \Delta LOG(UEMR)_{t-1} + U_t \quad (5)$$

The model in equation (5) was tested for the presence of co-integration using bounds test, which was popularised by Pesaran, Shin and Smith (2001). Post-diagnostic tests for serial correlation and heteroskedasticity were also conducted to determine the reliability of the model.

DATA ANALYSIS AND DISCUSSION OF FINDINGS

Unit Root Test

Table 1: Phillip-Perron Unit Root Test Result

Variables	Adj t-test	At 5%	P-Value	Stationarity
LOGMOUPUT	-4.617536	-2.945842	0.0007	I(1)
LOGFDI	-6.402270	-2.960411	0.0000	I(1)
INFR	-7.663435	-2.960411	0.0000	I(1)
LOGEXCH	-8.900554	-2.945842	0.0000	I(1)
LOGGFCF	-5.089164	-2.960411	0.0002	I(1)
LOGINTR	-4.512585	-2.957110	0.0011	I(0)
LOGUEMR	-5.096378	-2.960411	0.0002	I(1)

Source: Authors' computation using EViews 10

From Table 1 it can be seen that only interest rate ($LOGINTR$) is stationary at level, I(0); other variables, namely, manufacturing output ($LOGMOUPUT$), foreign direct investment (FDI), inflation rate ($INFR$), exchange rate ($LOGEXCH$), gross fixed capital formation ($LOGGFCF$) and unemployment rate ($LOGUEMR$), were stationary at first difference I(1) at 5% level of significance. This was so because the absolute values of the Phillip-Perron's statistic were greater than those of the critical values at the 5% levels of significance. Based on the unit root test result which has combination of I(0) and I(1), autoregressive distributed lag (ARDL) model of estimation was adopted in line with the prescription of Pesaran, Shin and Smith (1999).

Model Estimation

Table 2: ARDL Model Result

Variable	Coefficient	Standard Error	t-Statistic	P-Value
LOGMOUPUT(-1)	1.132190	0.137884	8.211175	0.0000
LOGMOUPUT(-2)	-0.112315	0.244530	-0.459308	0.6569
LOGMOUPUT(-3)	-0.316815	0.166116	-1.907191	0.0889
LOGUEMR	-212.1562	56.79220	-3.735657	0.0047
LOGUEMR(-1)	67.54613	37.55728	1.798483	0.1056
LOGINTR	-158.6496	39.34462	-4.032307	0.0030
LOGINTR(-1)	-24.48786	23.72414	-1.032192	0.3289
LOGINTR(-2)	-20.66202	25.71217	-0.803589	0.4423
LOGINTR(-3)	168.7098	41.78766	4.037312	0.0029
LOGINFR	-35.73594	9.113879	-3.921047	0.0035
LOGINFR(-1)	5.445296	6.196866	0.878718	0.4024
LOGINFR(-2)	-47.16251	8.368065	-5.636012	0.0003
LOGGFCF	-0.015000	0.112604	-0.133207	0.8970
LOGGFCF(-1)	0.422209	0.105336	4.008218	0.0031
LOGGFCF(-2)	-0.071021	0.085735	-0.828379	0.4289
LOGFDI	0.000356	0.000816	0.436566	0.6727
LOGFDI(-1)	0.004781	0.000903	5.292377	0.0005
LOGEXCH	-30.30409	9.687912	-3.128031	0.0122
LOGEXCH(-1)	-1.433524	8.812502	-0.162669	0.8744
LOGEXCH(-2)	32.89700	10.34125	3.181144	0.0112
C	8529.217	1474.376	5.784966	0.0003

Source: Authors' computation with EViews 10

The Table 2 result indicated that at 5% level of significance, there was a positive and significant impact of previous year's $LOGMOUPUT$(-1) [1.132190 with P-value = 0.0000] on current manufacturing output ($LOGMOUPUT$) but the reverse is the case for $LOGMOUPUT$(-2) [0.6569] and $LOGMOUPUT$(-3) [0.0889] on $LOGMOUPUT$ which showed negative and insignificant impact. Unemployment in the current period [$LOGUEMR$ = -212.1562; P-Value = 0.0047] has negative but significant impact on $LOGMOUPUT$ while unemployment in the first previous period [$LOGUEMR$(-1) = 67.54613; P-value = 0.1056] is positive but statistically insignificant. $LOGINTR$ = -158.6496 with P-value = 0.0030 and $LOGINTR$(-2) = 168.7098 with P-value = 0.0029 have negative but statistically significant impact on $LOGMOUPUT$ while $LOGINTR$(-2) = -20.66202 with P-value = 0.4423 has

negative but insignificant impact on the dependent variable. $LOGINFR$ = -35.73594 with P-value = 0.0035 and $LOGINFR$(-2) = -47.16251 with P-value = 0.0003 have negative but statistically significant impact on $LOGMOUPUT$ while $LOGINFR$(-1) = 5.445296 with P-value = 0.4024 has positive but insignificant impact on the dependent variable.

$LOGGFCF$ = -0.015000 with P-Value = 0.8970 has negative but statistically insignificant impact; $LOGGFCF$ (-2) = -0.071021 with P-Value = 0.4289 has negative but statistically insignificant impact while $LOGGFCF$(-1) = 0.422209 with P-Value = 0.0031 has positive and significant impact on the dependent variable. $LOGFDI$ = 0.000356 with P-Value = 0.6727 showed positive but statistically insignificant impact while $LOGFDI$(-1) = 0.004781 with P-Value = 0.0005 has positive and significant impact on the dependent variable. $LOGEXCH$ = -30.30409 with P-value = 0.0122 and $LOGEXCH$(-1) = -1.433524 with P-value = 0.8744 separately have negative but statistically insignificant impact while $LOGEXCH$(-2) = 32.89700 with P-Value = 0.0112 has positive but statistically insignificant impact on the dependent variable. The constant term (C) = 8529.217 with P-Value = 0.0003 indicated that it has positive and significant impact on the independent variables.

Table 3 captured the short run and long run estimation results of the ARDL model. The result showed that the long run impact of $LOGUEMR$ which has coefficient (-487.00103) and probability values (0.0253) on the dependent variable ($MOUPUT$) is negative and statistically insignificant; $LOGINTR$ with coefficient of -118.17089 and Probability value 0.5381 means that $INTR$ has negative but insignificant impact on the dependent variable; $LOGINFR$ with coefficient -260.83784 and probability value 0.0103 implies negative but insignificant impact on the dependent variable; $LOGGFCF$ with coefficient 1.132176 and probability value of 0.0069 shows positive but insignificant impact on the dependent variable; $LOGFDI$ with coefficient 0.017302 and corresponding probability value 0.0002 depicts positive and significant impact on the dependent variable; $LOGEXCH$ with long run coefficient 3.904464 and probability value 0.8347 implies positive but insignificant impact on the dependent variable. The long run intercept (C) [28723.713] with probability value 0.0032 shows positive significance and represents investment in the dependent variable that was not dependent on the explanatory variables. The cointegration - CointEq(-1) which has coefficient 0.296940 and probability value of 0.0014 indicates that it is significant and that the disequilibrium in the model will be corrected annually at the speed of 29%.

Table 3: Cointegrating and long run test result

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOGMOUPUT(-1))	0.429130	0.161161	2.662734	0.0259
D(LOGMOUPUT(-2))	0.316815	0.166116	1.907191	0.0889
D(LOGUEMR)	-212.15615	56.792196	-3.735657	0.0047
D(LOGINTR)	-158.64953	39.344617	-4.032307	0.0030
D(LOGINTR(-1))	20.662021	25.712169	0.803589	0.4423
D(LOGINTR(-2))	-168.70980	41.787658	-4.037312	0.0029
D(LOGINFR)	-35.735945	9.113879	-3.921047	0.0035
D(LOGINFR(-1))	47.162512	8.368065	5.636012	0.0003
D(LOGGFCF)	-0.015000	0.112604	-0.133207	0.8970
D(LOGGFCF(-1))	0.071021	0.085735	0.828379	0.4289
D(LOGFDI)	0.000356	0.000816	0.436566	0.6727
D(LOGEXCH)	-30.304090	9.687912	-3.128031	0.0122
D(LOGEXCH(-1))	-32.897005	10.341250	-3.181144	0.0112
CointEq(-1)	-0.296940	0.065630	-4.524430	0.0014

$$Cointeq = LOGMOUPUT - (-487.0011 * LOGUEMR - 118.1709 * LOGINTR - 260.8378 * LOGINFR + 1.1322 * LOGGFCF + 0.0173 * LOGFDI + 3.9045 * LOGEXCH + 28723.7122)$$

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGUEMR	-487.00103	181.924552	-2.676940	0.0253
LOGINTR	-118.17089	184.631549	-0.640036	0.5381
LOGINFR	-260.83784	80.741784	-3.230518	0.0103
LOGGFCF	1.132176	0.325119	3.482342	0.0069
LOGFDI	0.017302	0.002815	6.146039	0.0002
LOGEXCH	3.904464	18.175624	0.214819	0.8347
C	28723.713	7196.96336	3.991088	0.0032

Source: Authors' computation using EViews 10

The long run cointegration model as specified in Table 3 is:

$$LOGMOUPUT = 28723.7122 + 3.9045LOGEXCH + 0.0173LOGFDI + 1.1322LOGGFCF - (-260.8378LOGINFR) - (-118.1709LOGINTR) - (-487.0011LOGUEMR) \quad (6)$$

The model implies that in the long run, a 2872371.25% increase in the constant term will lead to a unit increase in the dependent variable; a 390.45% increase in $LOGEXCH$ will lead to a unit increase in the dependent variable; a 132.20% increase in $LOGGFCF$ will translate into a unit increase in the dependent variable;

a 1.73 % increase in $LOGFDI$ will lead to a unit increase in manufacturing in the long run; a 26083.779% increase in $LOGINFR$ will result in a unit increase in the dependent variable; a 11817.09% increase in $LOGINTR$ will lead to a unit increase in the dependent variable; a 48700.11% increase in $LOGUEMR$ will have a unit increase in the dependent variable.

Discussion of Findings

Manufacturing output in Nigeria is small. Nigeria should be compelled to produce more goods and services to match with her growing population which could be achieved through FDI in the manufacturing sector. FDI will introduce certain dynamics which clearly involves changes in input-output transformation leading to manufacturing output growth. The findings of this study establish significant but weak contribution of FDI to manufacturing output in Nigeria. The expected benefit of FDI in terms of employment gains is not realised as indicated by the high unemployment rate. This finding is in line with the findings of Hanson (2010) that doubted the possibility of FDI to create any significant causal effect on manufacturing output. The implication is that there is a weak correlation between FDI and manufacturing output in Nigeria. In other words, the policy environment, the economic and social indicators in Nigeria have not guaranteed foreign investors to focus attention on manufacturing investment. By far, the critical macroeconomic indicators estimated by this study (unemployment rate, inflation rate and exchange rate) show that Nigeria has a sad picture to show with respect to these indicators. These of course neutralise any expected benefits from FDI. The explanatory variable of FDI is weak but positive meaning that FDI policy in Nigeria can be relevant even in the long run. Given the regression results, short run and long run policies of the manufacturing sector should be targeted at FDI. The high exchange rate estimated is an indication that there is increased preference of some manufacturers to be more involved in buying and selling than in actual manufacturing, importing and repackaging at the expense of local content development. This creates interrelationship between high exchange rate, high unemployment rate and high inflation rate in Nigeria. The inability to manufacture will continue to cause manufacturing output to be small.

In respect of the second objective which has to do with the impact of FDI on manufacturing output in Nigeria, this study established that in the short run, it impacted manufacturing output positively but insignificantly. However, in the long run, the impact is both positive and significant. This long run impact is in line with theoretical a priori expectation and corroborates the findings of Loto (2010).

The pre-test (Phillip-Perron's unit root test), which tested for stationary, the post-test diagnostics (Breusch-Godfrey serial correlation test), which confirms the absence of serial correlation, heteroskedasticity test, which confirms the assumption

of constant variance, and test for absence of multicollinearity, imply that the findings of this study can be reliable.

CONCLUSION AND RECOMMENDATIONS

Nigeria's manufacturing sector has potentials for enhanced performance. This study concludes that the Nigerian manufacturing sector is relatively very weak and in need of urgent policy solution. In order to achieve all-round production and effective manufacturing, FDI is requisite for infusion of technological capabilities and skills into those involved in production, product design, process engineering, equipment design and fabrication that would make Nigeria's economy self-reliant. The study also concludes that the impact of FDI on manufacturing output in Nigeria within the period of study, though very weak, is significant.

The study made the following recommendations:

1. Government should intensify effort in promoting the ease of doing business by fighting corruption; grant some tax concessions to foreign and domestic investors especially those investing in critical sectors like manufacturing.
2. Increased public-private partnership to ensure increased capital formation and investment in infrastructure and manufacturing.
3. Nigeria's monetary policy in respect of interest rate, exchange rate and inflation rates should be fine-tuned by the Central Bank of Nigeria (CBN) to ensure monetary stability, supply of credits to the manufacturing sector at single digit interest rate.
4. There should be concerted efforts to reduce unemployment through local content development and manufacturing. The manufacturers Association of Nigeria (MAN) should work in collaboration with the government to identify key challenges of the sector and enforce local content policy.

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