

FOREIGN DIRECT INVESTMENT AND MANUFACTURING SECTOR PERFORMANCE: AN EMPIRICAL ANALYSIS FROM NIGERIA

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Abstract

Foreign direct investment (FDI) has been a significant source of capital needed for manufacturing firm performance in most nations for many years. FDI introduces cutting-edge technological transfer, enhances production methods, boosts competitiveness, and maximizes capacity utilization, resulting in increased output for the manufacturing sector. This study evaluates the impacts of FDI on manufacturing sector's performance in Nigeria. Data were collected, and an autoregressive distributed lags model is employed to analysis the data. The results demonstrated that FDI enhances manufacturing sector performance and that macroeconomic factors have a favorable impact on FDI. A long-run relationship exists between FDI and manufacturing capacity utilization. The relationship between FDI and the performance of the manufacturing sector follows the bidirectional Granger causality. The study recommends that the government to take action to promote trade openness in order to draw in more FDI.

Keywords: *FDI; Autoregressive Distributed Lags Model; Granger Causality.*

1. Introduction

Any economy's manufacturing sector is essential for the production of goods and services, the development of employment possibilities, and the conversion of developing economies into established systems. Today, a nation's level of economic development is most frequently indicated by how advanced and effective its manufacturing sector is. As a result, many nations work to develop their manufacturing sectors through increased investment or FDI, which is thought to bring in new technology, innovations, and employment opportunities. Moreover, local oil and gas businesses may decide to expand their operations abroad through what is known as outbound foreign direct investment. This decision may have a beneficial or negative impact on the host

nation's industrial sector (Kimiagari et al., 2023; Ayenew, 2022; Afolabi et al., 2019; Azolibe, 2020; Wang, 2009).

According to Chenery and Strout (1966), FDI influx is anticipated to transfer technology and improve management and marketing capabilities to local industries, hence boosting their productivity and contributing to the host country's overall economic growth. It is clear that FDI has recently overtaken other external resource flows as the most significant source for developing countries, and it has a significant impact on the performance of the manufacturing sector. Additionally, FDI has the ability to significantly alter economies through innovation, productivity growth, and the creation of better-paying, more secure jobs in host nations, in FDI-attracting industries, as well as in ancillary sectors (Antonietti et al., 2023; Arnold et al., 2011; Ebekozien et al., 2015).

Significantly, the largest economy in Africa, Nigeria, has drawn a sizable amount of FDI in recent years. Nigeria received \$1874.04 billion in foreign direct investment in 2002, an increase from \$193.2 million in 1986. It increased further from \$2005.4 billion to \$5609 billion for the years 2003 to 2013. From 0.93 percent in 1986 to 5.05 percent in 2009, the amount of FDI climbed as a percentage of GDP, but it then fell to 1.64 percent in 2010 and 1.07 percent in 2013. (UNCTAD, 2015). The Nigerian government has put in place a number of laws and policies to encourage FDI-welcoming investment environments. The Income Tax Ordinance Act of 1952, the Industrial Development Act of 1958, and the New Industrial Policy of 1989 are a few of these measures. Many reforms have been implemented since 1990 to draw FDI. The establishment of the Nigeria Investment Promotion Commission in 1995, which allowed full foreign ownership aside from the petroleum sector and opened all economic sectors to foreign participation with the exception of the negative list (such as drugs and arms), was one reform that paved the way for economic renewal and attracted FDI. 2010 saw the adoption of investment laws as well as efforts to improve the nation's standing abroad. To entice foreign investors, the Economic and Financial Crime Commission was established and bilateral investment treaties were signed. As a result, the privatization strategy was implemented, which comprised giving private individuals or businesses ownership or management of state-owned organizations (Adeleke, 2014).

The relationship between FDI and the performance of industrial growth in Nigeria is examined in earlier empirical studies (Adejumo, 2013; Akinlo, 2004; Adeusi, 2012; Idoko, 2018; Osuagwu &

Nwokoma, 2017; Kimiagari et al., 2023; Wei et al., 2022). The majority of studies concentrated on how FDI increases manufacturing capacity utilization while ignoring how FDI affects the production contribution of the manufacturing sector (performance). The goal of this study is to look into how FDI affects Nigeria's manufacturing sector's performance. We investigate the impact of macroeconomic fundamentals on FDI in Nigeria, the effect of FDI on the utilization of manufacturing capacity in Nigeria, the contribution of the manufacturing sector to the Nigerian economy, and the direction of the causal relationship between FDI and manufacturing output performance. The rest of the study is structure thus, section two reviews literature and section three describe the estimation. Section four discusses the results and section five is the conclusions.

2. Literature review

Multinational firms invest in foreign nations through FDI in order to manage production processes and control assets there. It is a long-term investment that shows that a foreign investor has control over a business organization that is based in a different economy than the investor (International Monetary Fund, IMF, 2015). UNCTAD (2008) defined foreign direct investment (FDI) as a long-term partnership between a company in the investor's home country and a different company in the host nation (country of investment). When a company or firm invests directly in properties or manufacturing in another nation over which it effectively exercises control, that investment is known as FDI. According to Bloningen (2014), a foreign company invests in the commercial world by creating manufacturing, service, and production firms as subsidiaries in nations other than their own. The investing company must own at least 10% of the common shares in order for the investment to be classified as an FDI (World Bank, 2012).

According to Massoud (2003), as globalization activities intensified in the 1990s, FDI became more significant and was seen as one of the main drivers of advancement by many economists. Because to its perceived benefits as a tool of economic development, most nations try to draw FDI. Because it complements local investment and promotes technology transfer in the host country, this investment is a crucial stimulant for economic progress in emerging nations. It enters the host nations in a variety of ways, including as foreign capital, goods, new technology or manufacturing methods, and contemporary management techniques. Nwankwo (2016) highlighted that FDI promotes local firms' access to international markets, increases product diversity, and serves as a

route for the transfer of technology. It also provides superior talents and management practices. Certain FDIs contribute to the growth of global businesses by giving companies access to new markets and distribution channels for their goods.

Empirical studies have thoroughly examined how FDI affects growth. In certain research, FDI for host economies is examined using the data that is already accessible. Obwona (2001) investigated how FDI factors affected Uganda's economic growth. He noted that FDI flows into Uganda are significantly influenced by macroeconomic, political, and policy consistency factors, and that FDI has a beneficial impact on growth. For a sample of 107 developing nations, Uwatt (2002) examined the link between FDI, growth, and domestic investment over the 1980–1999 years. He used labor, the stock of human skills, the flow of production, domestic and international capital ownership, and total factor productivity as their independent variables. His estimated panel statistics for the production function framework point to a favorable impact of FDI on growth. Even while FDI appears to displace domestic investments in some nations, FDI has, overall, had a positive impact on domestic investments.

A sectoral analysis of FDI and growth in developed nations was done by Vu and Noy (2009). They concentrated on how Investment in particular sectors affected growth. They discovered that FDI interacts with labor to have favorable, albeit not very significant, effects on economic growth. The impacts appear to vary greatly between nations and economic sectors. Using the Dougherty model, Aysha, Muhammad, and Sara (2011) looked at the effect of FDI on manufacturing output growth from 2006 to 2010. To evaluate the data, they used the paired t-test and ordinary least square (OLS). Their findings indicate that FDI has little effect on rising manufacturing production. The effect of FDI on the expansion of industrial output for the Economic Community of West African States was examined by Patience (2011). According to the data, FDI helps West Africa's output grow. Babatunde and Adepeju (2012) looked at the factors that determine foreign direct investment and assessed whether certain factors, such as the availability of natural resources, macroeconomic stability, market size, openness to trade, infrastructure development, and political risk, have an effect on FDI in the oil and gas sector. The Central Bank of Nigeria and the United Nations Conference on Trade and Development (UNCTAD) reports provided data from a sample size of twenty-one years, which was then analyzed. The findings demonstrated that the availability of natural resources, tax incentives, and trade openness have a major impact on foreign direct

investment (FDI) in Nigeria's oil and gas industry. Market size, macroeconomic stability, infrastructural development, and political risk do not, however, significantly affect Investment in Nigeria's oil and gas industry.

Osisanwo (2013) investigated how FDI affected Nigeria's manufacturing production growth between 1970 and 2011. The degree of openness, investment human capital development, log of FDI, initial lag of real manufacturing output level, and inflation rate were all considered in the study. As a regressand, actual manufacturing output growth serves as a proxy for manufacturing output growth. The OLS was used, and the outcome showed that real manufacturing output level and inflation are important factors determining the growth rate of manufacturing, while manufacturing production is negligible and inelastic to foreign direct investment in Nigeria. Between 1970 and 2009, Adejumo (2013) looked at the relationship between FDI and the value added to Nigeria's manufacturing sector. He found that, in the long run, FDI have a detrimental impact on the manufacturing sub-sector in Nigeria using the ARDL model to analyze the link.

To examine the pattern of flow and determine the impact of increased FDI flow on the industry, Ebekozen, Ugochukwu, and Okoye (2015) conducted an analysis on the inflow trends of FDI explored in the Nigerian construction industry. data in a time series from the CBN. Simple percentages, regression analysis, and the Granger test were used to evaluate the data collected, and the test was used to assess the hypotheses. Findings showed that, in comparison to other economic sectors, the construction sector had a poor flow of foreign direct investment. The Granger causation is bi-directional, indicating that FDI is a necessary condition and a driving force behind construction's sustainable growth and development. Okoli and Agu (2015) used time series data covering a 35-year period to assess the effect of FDI on the performance of Nigerian manufacturing enterprises. Both the long run and short run causalities were determined using the vector error correction model (VECM) and the OLS estimate with FDI modelled as a quadratic function. The findings highlight the necessity for government initiatives to be focused on strategically preserving that will support FDI inflows, particularly in the long run.

Ehijiele, Sunday, and Nurudeen (2016) looked on how FDI affected Nigeria's industrial industry. OLS technique was utilized in examining the association between FDI and economic variables as manufacture output, exchange rate and interest rate. The model found a favorable association between FDI and manufacture output, exchange rate and interest rate. FDI has a favorable

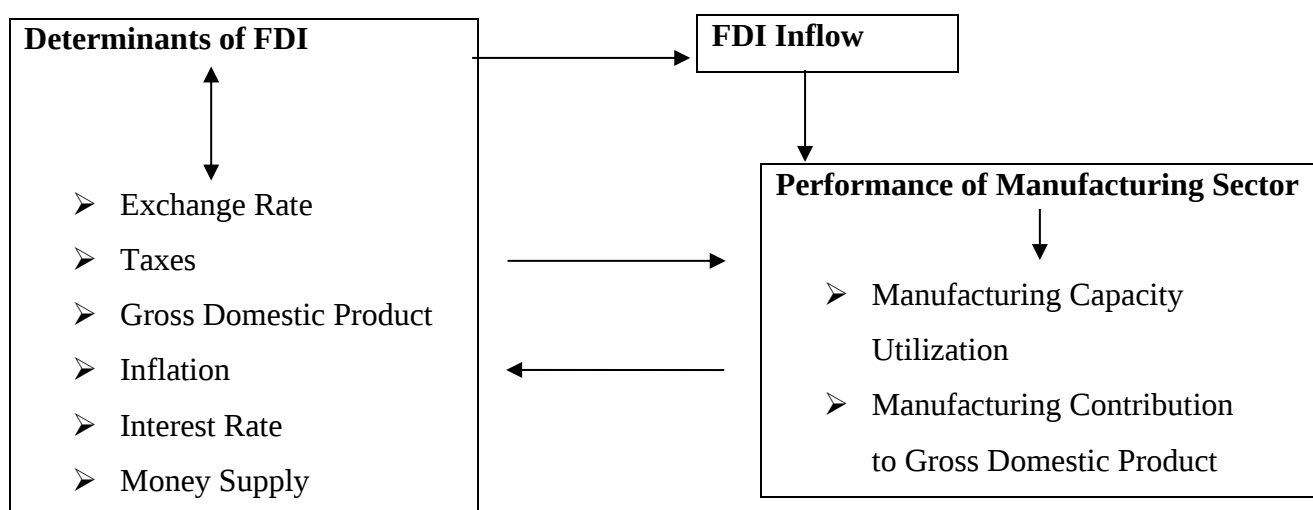
relationship on the manufacturing sector in Nigeria. In their 2017 study, Osemene, Kolawole, and Olanpeleke looked at how FDI affected the expansion of the Nigerian economy. The study looked at a number of factors that influence FDI in Nigeria. For the time series from 1984 to 2015, the study used VECM and the cointegration test. According to the study, FDI has a positive relationship with import and exchange rate but a negative relationship with economic growth, export, inflation, and interest rate.

3. Research methodology

3.1. Conceptual Framework for FDI

The framework below is design in this work to indicate the relationship that existed between the variables in this study and this implies that the direction of the move is from determinant of FDI and the inflow of FDI influence performance of manufacturing sector which will in-turn influences Nigerian economy. The framework is developed for this research work and to understand how each variable related to each other. The framework shows that there is significant relationship between the variables and they influence one another. The model explained that the inflow of FDI is significant in improving the country's manufacturing production and this would go a long way in enhancing inflow of foreign direct investment.

Fig 1: Conceptual Framework for FDI



Source: Author's Model (2023)

3.2. The Models

The models used is adopted and modified from Ebekozen, Ugochukwu and Okoye (2015) as:

$$FDI = f(GDP, EXR, INF, INT) \quad 3.1$$

$$FDI_t = \beta_0 + \beta_1 GDP_t + \beta_2 EXR_t + \beta_3 INF_t + \beta_4 INT_t + \mu_t \quad (3.2)$$

The model that examines the effect of taxes on FDI is:

$$FDI = f(GDP, EXR, INF, INT, TAX, MS) \quad 3.3$$

$$FDI_t = \beta_0 + \beta_1 GDP_t + \beta_2 EXR_t + \beta_3 INF_t + \beta_4 INT_t + \beta_5 TAX_t + \beta_6 MS_t + \mu_t \quad (3.4)$$

The model that examines the effect of FDI on manufacturing sector is:

$$MCU = f(FDI, EXR) \quad 3.5$$

$$MCU_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXR_t + \mu_t \quad (3.6)$$

The model that shows the effect of FDI on contribution of manufacturing sector to GDP is:

$$MGDP = f(FDI, EXR) \quad 3.7$$

$$MGDP_t = \beta_0 + \beta_1 FDI_t + \beta_2 EXR_t + \mu_t \quad (3.8)$$

The Granger causality test for the direction of causality between FDI and manufacturing sector is;

$$MCU_t = \alpha + \sum_{i=1}^{\eta} \beta_i FDI_{t-i} + \sum_{i=0}^{b_1} \theta_i \ln MCU_{t-i} + \Omega t \quad (3.9)$$

The Granger causality test equation for MCU granger cause FDI is specified as:

$$FDI_t = \alpha + \sum_{i=1}^{\eta} \beta_i MCU_{t-i} + \sum_{i=0}^{b_1} \theta_i \ln FDI_{t-i} + \Omega t \quad (3.10)$$

Where FDI, GDP, MGDP, MCU, EXR, INF, INT, TAX, and MS are foreign direct investments, gross domestic product, contribution of manufacturing sector to GDP, Manufacturing capacity utilisation, exchange rate, inflation, interest rate, taxes and money supply, respectively. The error terms are μ_t , and Ωt while t is time subscript.

3.3. The Data and Estimation Method

This study employed secondary data sourced from CBN statistical bulletin. This study covers the period between 1987 and 2020. The OLS method, fully modified ordinary least squares (FMOLS) and VECM were used to estimate similar models in previous studies. The employed the ARDL model for the study because presence of long-run relationships that exist between the economic time series and their lagged values. Some tests (serial correlation test was conducted with the use of Durbin Watson statistics; stationary test using the Augmented Dickey Fuller, ADF and Phillips-Perron, PP; normality test using Jarque-Bera test and heteroskedasticity test were estimated. Since

most time series data are trended, in order to avoid spurious regression, the ADF and PP unit root test were conducted. The null hypothesis of the test is that the variable is nonstationary - has unit root. We employ ARDL bound test for cointegration. The null hypothesis of no cointegration relationship is rejected when the F-statistics is greater than the critical value of upper bound at a significance level.

4. Results and interpretation

Table 4.1: Test of Stationarity

Variables	ADF test statistic	5% critical level	PP test statistic	5% critical level	Order of integration	
					ADF	PP
MGDP	-3.522376	-3.484901	-4.014551	-2.948490	I(0)	I(0)
MCU	-5.091198	-3.280623	-6.067099	-2.580623	I(1)	I(1)
FDI	-6.212010	-3.587527	-8.018417	-4.027527	I(1)	I(1)
EXR	-5.019006	-4.000623	-6.124780	-4.180623	I(0)	I(0)
GDP	-7.186737	-4.080623	-8.054311	-4.010623	I(0)	I(0)
INF	-4.901159	-4.007527	-7.801900	-4.010623	I(1)	I(1)
INT	-5.011198	-4.080623	-6.067291	-4.010623	I(1)	I(1)
TAX	-3.701886	-4.095021	-12.25787	-3.813623	I(1)	I(1)
MS	-6.561323	-2.595026	-7.522824	-4.010623	I(1)	I(1)

Source: Author's computation (2023).

The result of both the ADF and PP test reveals that MCU, FDI, INF, TAX and MS are stationary at levels. That is integrated of order zero, I(0) while MGDP, EXR and GDP are stationary at first difference which mean that they are integrated of order one, I(1). To estimate these series with combination of I(0) and I(1), the ARDL bound test of cointegration is conducted.

Table 4.2: ARDL Bound Cointegration Test

Model	F-statistic	Lower Bound (at 5%)	Upper bound (at 5%)	Remarks
MGDP	5.23	2.33	3.78	Significant
MCU	3.99	2.33	3.29	Significant
FDI	4.13	2.33	3.19	Significant

Source: Author's computation (2023)

The results of the test indicate that the F-statistics of MGD, MCU and FDI models are 5.23, 3.99 and 4.13 respectively with critical values of upper bound 3.78. This shows that the F-statistic of each the models is higher than those of the upper bound for the models. The ARDL bound test shows that there is long-run equilibrium between the variables in all the models.

Table 4.3: The ARDL Model

Variable	Coefficient	Std. Error	Prob.*
C	-6.22718	1.794057	0.0108
FDI (-1)	3.214128	3.002186	0.0170
GDP(-1)	2.399794	0.933257	0.0150
INF	0.110120	0.053362	0.2049
INF (-1)	0.023624	0.046684	0.3116
INT	-0.135763	0.212734	0.2427
INT(-1)	2.601459	0.490740	0.0176
EXR(-1)	-2.140931	0.052209	0.0293
TAX	-1.210824	2.662209	0.0433
TAX(-1)	-3.690812	1.403018	0.0151
MS	1.311123	0.554009	0.0035
MS(-1)	3.02309	0.481109	0.0145
ECT(-1)	-0.88757	0.010363	0.0076
R-squared	0.805457	Mean dependent var	4.150464
Adjusted R-squared	0.723460	S.D. dependent var	3.201459
S.E. of regression	2.068568	Akaike info criterion	3.215360
Sum squared resid	34.21331	Schwarz criterion	4.514711
Log likelihood	-34.95972	Hannan-Quinn criter.	3.100111
Durbin-Watson stat	1.824812		

Source: Author's computation (2023)

The result of the ARDL model is presented in Table 4.3. The result shows that INF, TAX and EXR are negatively related to FDI while GDP and MS are positively related to it. This implies that increase in inflation, taxation and exchange rate will impede FDI while rise in GDP and money supply will promote FDI in Nigeria. The result shows that lagged INT, TAX, MS, EXR and GDP are statistically significant. The significance is shown by the various statistics (standard errors, T-

statistics and the P-values). For instance, the standard error (0.93325) of the coefficient (2.39979) (GDP (-1)) is less than half of the coefficient. The coefficients of INT(-1) and EXR(-1) are 2.60145 and -2.14093 while their standard errors are 0.490740 and 0.052209 and significant at 5%. Halves of the values of the coefficients are greater than the standard errors while the P-values are less than 5% level of significance.

The established statistics shows that the variables, INT and EXR(-1), are statistically significant. This implies that INT, EXR are significant determinants of foreign direct investment in Nigeria. The coefficients of TAX and MS(-1) are -1.21082 and 0.48110 while their standard errors are 2.662209 and 0.481109 and the P-values 0.0151 and 0.0145 respectively. Halves of the values of the coefficients are greater than the standard errors while the P-values are less than 5% level of significance. However, INF does not have significant impact on foreign direct investment of Nigeria over the period covered. The coefficient of the error correction term (ECT) is -0.88757 with P-value 0.0076 showing the short run to long run dynamics of the model. It is negative and significant at 5% level. This means about 88.75% of the disequilibrium in the model is corrected every year. The adjusted R-squared statistics (0.72) shows that 72% of changes in FDI is explained by changes in the independent variables.

Table 4.4: Result for MCU Model

Δ MCU	Coefficient	Std. Error	Prob.
C	1.212947	0.119498	0.4504
Δ MCU(-1)	0.662397	0.130043	0.0002
$\Delta \ln \text{EXRA}(-1)$	-1.191330	0.157900	0.0451
$\Delta \ln (\text{EXRA})$	-2.048559	0.028013	0.0720
Δ TAX	-1.422675	0.531205	0.3556
Δ TAX(-1)	2.013405	1.002105	0.2274
$\Delta \ln$ MS	0.035845	0.262094	0.0305
$\Delta \ln$ MS(-1)	0.104059	0.018383	0.0082
$\Delta \ln$ FDI	-0.236958	0.114690	0.0334
$\Delta \ln$ FDI(-1)	-0.946168	0.158599	0.0234
Δ INFL	0.026185	0.015299	0.4377
Δ INFL(-1)	-0.070960	0.023908	0.2652
Δ INT	0.278903	0.181268	0.1993

$\Delta INT(-1)$	0.346561	0.113721	0.1034
ECTMCU(-1)	-0.450002	0.209471	0.0385
R-squared	0.889214	F-statistic	9.215989
Adjusted R-squared	0.745346	Prob(F-statistic)	0.000372
Log likelihood	-57.17992	Durbin-Watson stat	2.039390

Source: Author's computation (2023)

Table 4.4 shows the results of ARDL model which was estimated to evaluate the influence of FDI on capacity utilisation. The R-squared of 0.8892 indicates that the model is of good fit. This implies that 88% of systematic variations in manufacturing capacity utilisation (MCU) were accounted for by foreign direct investment (FDI), tax (TAX), money supply (MS), exchange rate (EXR), inflation rate (INFL) and interest rate (INRA). The coefficient of ECM, (ECTMCU(-1) is -0.4500, since it is negative and significant, it implied that manufacturing capacity utilisation (MCU) responds slowly to shocks from FDI and other macroeconomic variables considered. This means that MCU is getting adjusted at a speed of 45% from state of disequilibrium in the short run to the state of equilibrium in the long run.

Another look at Table 4.4 indicates that previous value of manufacturing capacity utilisation (MCU(-1)) and its current value are positively related with a coefficient of 0.662397. The results also indicate that change in manufacturing capacity utilisation is inversely related to change in natural log of exchange rate ($\Delta \ln EXRA$) and first lag of change in natural log of exchange rate ($\Delta \ln EXRA(-1)$) with coefficients of -2.048559 and -1.191330 respectively. This means that increase (depreciation) in exchange rate would lead to decrease in manufacturing capacity utilisation (MCU). Similarly, the results obtained show that ΔMCU has a direct relationship with external reserves ($\Delta \ln MS = 0.035845$ and $\Delta \ln MS(-1) = 0.104059$). So, all other things being, MCU increases with increasing money supply at a rate 0.107%.

The table reveals further that the coefficients of foreign direct investment (FDI= -0.2369, -0.9461), is statistically significant due to high standard deviation. So, the null hypothesis can be rejected at 5%. Conversely, the study reveals that the coefficients of tax (TAX= -1.422675, 2.013405), inflation rate (INFL=0.0261, -0.0709) and interest rate (INT= 0.278, 0.346) are not statistically significant due to low t-statistic. So, the null hypothesis can individually be accepted. In general, the overall significance of the ARDL model is established by the F-statistic of 9.215. This implies that

the null hypothesis that foreign direct investment, exchange rate, money supply, inflation rate, interest rate and money supply are jointly simultaneously equal to zero can be rejected at 1% level of significance. Thus, it can be concluded that all the foreign direct investment has significant impact on manufacturing capacity utilisation.

Table 4.5: Result of the MGD Model

$\Delta \ln \text{MGDP}$	Coefficient	Std. Error	Prob.
C	-0.066820	0.145670	0.6530
ΔTAX	1.322507	1.963406	0.9074
$\Delta \text{TAX}(-1)$	1.802107	0.1541106	0.8982
$\Delta \ln \text{FDI}$	0.129609	0.060064	0.0465
$\Delta \ln \text{FDI}(-1)$	0.188983	0.088543	0.0486
$\Delta \ln \text{EXR}$	-0.203027	0.128298	0.1344
$\Delta \ln \text{EXR}(-1)$	-0.036269	0.146714	0.8081
$\Delta \ln \text{MS}$	0.019619	0.213252	0.0617
$\Delta \ln \text{MS}(-1)$	0.371108	0.191791	0.0352
ΔINFL	-0.012963	0.003640	0.1928
$\Delta \text{INFL}(-1)$	-0.001143	0.003166	0.7231
ΔINTRA	-0.010077	0.021572	0.6471
$\Delta \text{INTRA}(-1)$	-0.002192	0.021586	0.7781
$\text{ECTMGDP}(-1)$	0.412957	0.290566	0.0067
R-squared	0.355614	F-statistic	6.728138
Adjusted R-squared	0.628644	Prob(F-statistic)	0.008425
Log likelihood	13.53972	Durbin-Watson stat	1.727573

Source: Author's computation (2023)

The results ARDL model in Table 4.5 examine the impact of FDI on manufacturing contribution to GDP in Nigeria. With the R-squared implies that 76% of the systematic changes in manufacturing contribution to GDP in Nigeria are explained by captured variables. The $\text{ECTMGDP}(-1)$ term is positive and significant at 1%. This connotes that manufacturing contribution to GDP is getting adjusted to the shocks from FDI while moving from state of disequilibrium in the short run. The results also indicate that change in exchange rate has a negative relationship while change in FDI ($\Delta \ln \text{FDI}$) has a positive relationship with coefficients of 0.1296 and 0.189 respectively. The

manufacturing sector contribution to GDP increases (appreciate) with increasing FDI assuming all others remain constant. Similarly, the coefficients of $\Delta \ln MS$ (0.669) and $\Delta \ln MS(-1)$ (0.671) indicate that there is direct relationship between manufacturing sector contribution to GDP and money supply. We can reject the null hypothesis that money supply (MS) has no significant influence on manufacturing sector contribution to GDP at 10% level of significance.

Another look the ARDL model results indicates that the coefficients of tax (TAX), exchange rate (EXR), inflation rate (INFL), and interest rate (INRA) are not statistically significant due to relatively low t-statistics (-0.118, 0.130; 1.582, 0.247; -1.364, 0.361; 0.467, -0.287 respectively). On the whole, the overall significance of the model is established by the F-statistic of 6.7281. This implies that the underlying null hypothesis that tax, money supply, exchange rate, inflation rate and interest rate are jointly simultaneously equal to zero can be rejected at 1% level of significance.

Table 4.6: Result of Diagnostic Test for all the Models

Models	Breusch-Pagan-Godfrey Test		Breusch-Godfrey LM Test	
	F-statistic	P- value	F-statistic	P-value
FDI model	2.877988	0.2251	0.761304	0.4868
MCU Model	2.825285	0.1022	0.479229	0.6306
MGDP model	2.511090	0.1428	0.286673	0.7567

Source: Author's computation (2023)

Breusch-Pagan-Godfrey test of Heteroscedasticity and Breusch-Godfrey Serial Correlation LM test were conducted for all the models in this study and the results are presented in table 4.6. Heteroscedasticity test is usually conducted to test the presence or otherwise of heteroscedasticity (variability of variance of the series) in the model. The null hypothesis of the test is that the series are homoscedastic (there is no heteroscedasticity). The result of the Breusch-Pagan-Godfrey test of heteroscedasticity presented shows that the F-statistics of test are 2.877988, 2.825285 and 2.511090 with p-value 0.2251, 0.1022 and 0.1428 for the model on FDI, MCU and MGDP respectively. Since, all the P-values are greater than 5%, the null hypothesis is not rejected. So, the test shows that there is no heteroscedasticity in all the models.

Another test conducted is the Breusch-Godfrey Serial Correlation LM test. The null hypothesis is rejected when the probability value of the F-statistics of the test is less than a chosen level of significance (usually 5%). The F-statistics for serial correlation tests for the entire models are FDI=0.761304, MCU=0.479229 and MGD_P=0.7567. Since the probability values of the F-statistics of the respective models are greater than 5% level of significance, the null hypothesis is accepted and we conclude that there is no serial correlation in all the models. The results of all the models are free from the problem of heteroscedasticity and serial correlation.

Table 4.7: Pairwise Granger Causality Tests

Null Hypothesis:	Obs.	F-Statistic	Prob.
FDI does not Granger Cause MCU	31	16.4068	0.0004
MCU does not Granger Cause FDI	31	13.4939	0.0011

Source: Author's computation (2023)

The result of the granger causality test presented in table 4.7 shows bidirectional causality between FDI and MCU. The F-stat of the two hypothesis (FDI does not Granger Cause MCU and MCU does not Granger Cause FDI) are 16.407 and 13.494 with P-values 0.0004 and 0.0011, respectively. We do not reject the null hypotheses, implying that FDI granger cause MCU and in turn MCU granger causes FDI. So, FDI improves manufacturing capacity utilization which in turns attracts FDI.

5. Conclusions

One notable change that has taken place in economic policies in Nigeria in the last few years was how to attract FDI into the economy. In order to attain growth, Nigeria needs to develop new skills, knowledge, institutional and organizational structures and to master new technological process. This study investigates the effect of FDI on manufacturing. It was revealed that interest rate, tax, money supply and exchange rate influence FDI in Nigeria. The study further examined the impact of FDI on manufacturing contribution to GDP in Nigeria. The result shows that FDI is negatively related to manufacturing contribution to GDP in Nigeria. There is also existence of a long run relationship amongst the variables specified in the FDI determinants model at 5% significant level. There was evidence that FDI positively affect manufacturing capacity utilization. These evidences

are consistent with internalization theory which assumes that local companies may use the technology provided by international firm to compete and improve their productivity. We recommend that Nigeria government should involve in export led economy by promoting fiscal policies such as tax incentives that will specially enhance the domestic capacity of its citizens thereby reducing imports which will in turn promotes performance of manufacturing sector. Also, adopting a single exchange rate rather than operating dual exchange rate that will encourage Nigerian economy to openness of trade so as to attract more foreign direct investment.

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