



## **Determinant Of Foreign Direct Investment On The Manufacturing Sector: Evidence From Nigeria**

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### **ABSTRACT**

The main objective of this research paper is to examine the impact of Foreign Direct Investment (FDI) on the Nigerian Manufacturing Sector over a period of thirty-seven years (37) years from 1986 – 2021. In order to achieve this, Annual time series data on the variables Manufacturing performance (MPF), Foreign Direct Investment (FDI), Exchange Rate (EXR), Interest Rate (INTR), Degree of Openness (DOP) and Government Capital Expenditure (GCE) were collected from the Central Bank of Nigeria (CBN) Statistical Bulletin and the National Bureau of Statistics. The tools of empirical analysis employed were The Augmented Dickey Fuller (ADF) Unit Root test, the ARDL Bounds Test for Co-integration and the Auto Regressive Distributed Lag (ARDL) Model. Results from this study revealed that there exists a positive and significant impact of Foreign Direct Investment on the Nigerian Manufacturing Sector in both the short and long run. This indicates that FDI is vital to the development of the sector. This study therefore recommends that , the Federal Government through the help of the monetary authority work out appropriate rate of interest charged on loans advanced to the commercial banks to encourage more domestic and foreign investors in the manufacturing sector. More so, bank of industry needs to be re-energized and upgraded to meet up with the financial need of the contemporary industrial age in Nigeria.

**Keywords:** Foreign direct investment, Manufacturing sector, degree of openness, Auto regressive distributed lag, Exchange rate, Interest rate

### **INTRODUCTION**

Over the years, related research has provided evidence of the contribution that foreign direct investment (FDI) makes to the process of economic expansion of emerging economies. This is in light of the fact that foreign direct investment (FDI) not only supplies developing countries with much-needed investment funds but also fosters the development of managerial abilities, job creation, and technology transfer. It also supports domestic investment, which is important for achieving long-term economic expansion. Thus, according to Obida & Abu (2010) many developing nations have implemented policies to encourage FDI inflows as well as macroeconomic changes aimed at fostering an FDI-friendly business environment, such as the ease of doing business policy of the government. By implication, foreign businesses attempt to take advantage of such policies to further their various goals of ensuring stable monopolistic control over raw material sources in the FDI recipient countries, gaining access to the control of local markets, and benefiting from the cheap labor in the FDI recipient countries, just as businesses in developing economies benefit from FDI inflow.

As a consequence, Umah (2007), opined that the Nigerian government has over the years implemented a number of innovative and useful economic changes in acknowledgment of the significance of FDI. These changes according to him, were anticipated to boost private sector involvement, remove administrative roadblocks, and enable long-term profitable corporate operations in Nigeria. According to data from the

United Nations Conference on Trade and Development (UNCTAD, 2021), Foreign direct investment, net inflows (% of GDP) in Nigeria rose from 0.35 percent in 1986 to 1.09 percent in 1990. It further rose to 5.79 percent by 1994, and later declined to 0.55 percent by 1998. Thereafter, it increased to 1.69 percent in 1999. However, FDI net inflows (% of GDP) in Nigeria, increased from 1.64 percent in 2000 to 2.90 percent in 2009. According to UNCTAD (2015) the global downturn in oil prices, caused Nigeria FDI net inflows (% of GDP) to decline from 0.82 percent in 2014 to 0.75 percent in 2021. Given the critical role that FDI plays in closing the enormous gap between saving and investment, the slow rate at which these investments are being attracted is a key source of concern for policymakers in emerging nations.

The manufacturing industry in Nigeria, like other economic sectors, has struggled to draw enough foreign investment throughout the years. This is unfortunate because the manufacturing industry is crucial to an economy because it drives the conversion of raw materials into finished goods (Eche, 2016). Although the manufacturing sector quickens the pace of economic diversification and structural improvement, which enables a nation to use its resources and rely less on the importation of completed items or raw materials (Adediran & Obasan, 2010). The trade restrictions and industrial policies of the government that were previously discussed caused a sharp fall in the amount of foreign exchange allocated to this sector, which in turn reduced the importation of industrial raw materials and spare parts needed for sector output. These necessary industrial inputs were too expensive to obtain, and the foreign currency required for such purchases was in short supply. This has led to a significant decline in capacity utilization, widespread industry shorting, and significant job losses.

According to Adediran & Obasan (2010), since 1984, the manufacturing sector's capacity utilization has averaged less than 60%, and the majority of manufacturing companies have been running at or below production capacity. The sector has been badly impacted by this, making it challenging for businesses to meet local demand, let alone produce for export. The industry struggled with a lack of raw materials for production and a lack of foreign currency to acquire capital equipment and production-related spare components. The manufacturing sector has continued to operate far behind expectations despite a number of government initiatives to increase industrial production and capacity utilization. It is against this background that this study intends to investigate the impact of foreign direct investment on the Nigerian manufacturing sector between 1986 to 2021.

## **LITERATURE REVIEW**

### **Theoretical Literature**

Several theories have been propounded by scholars in explaining foreign direct investment. These theories have sought to explain why multinational co-operations elect to use foreign direct investment rather than to license their technology to foreign firms. Why firms go aboard as direct investors. These and other related questions serve as the bedrock for the emergence and refinement of most of the theories of foreign direct investment. These theories are; the comparative advantage theory, eclectic theory and location theory amongst others.

Theoretically, the literature on FDI identifies and classifies the motives that encourage companies to invest overseas into four (UNCTAD, 2009). These are: (i.) Market-seeking motives, which highlight access to markets that are attractive because of their present size and the identified potential for expansion. (ii.) Efficiency-seeking motives aimed at taking advantage of cost-efficient methods of production. This is approximated by the cost and productivity of capital, labour, infrastructure and the administrative cost of doing business. (iii.) Natural resource-seeking motive which seeks to tap into the natural resources endowments in the locations being considered as against others. (iv.) Strategic asset-seeking motive oriented towards man-made assets, as embodied in the quality of the work force, the brand names, and market shares. These motives are however never considered alone, as they usually combine to determine FDI location, based on expected profitability (Ajayi 2006).

### **Empirical Literature**

Adabor, Oteng-Abayie, & Buabeng (2022) investigated the effect of institutional quality in Ghana between 1980 and 2019 in order to determine how foreign direct investment affected the expansion of the manufacturing sector. As an estimating method, the study employed the bound test technique to cointegration within the autoregressive lags model (ARDL) framework. According to the ARDL findings, FDI has a detrimental impact on the expansion of the manufacturing sector. The expansion of the manufacturing sector is positively and significantly impacted by the relationship of FDI and institutional quality. These findings demonstrate the necessity of high-quality institutions in addition to FDI influx to support the expansion of the manufacturing sector.

Using ARDL and NARDL estimating methodologies, Folorunsho, James, & Johnson (2022) investigated the shadow economy and foreign direct investment in Nigeria's manufacturing sector during the years 1975–2017. According to the study, a rise in the shadow economy reduces FDI net inflow over the short term but increases it over the long term. When re-estimating the model with NARDL, this result remains. Both negative and positive changes in the extent of the shadow economy have long-term favorable effects on FDI in the sector. Nevertheless, in the short term, both changes have negative and significant consequences on FDI. The findings suggest that due to tax breaks and other financial incentives available to new entrants, new foreign investors would prefer to operate in the formal sector in the short term. On the other hand, due of expiring incentives and the high cost of doing business in the nation, the shadow economy eventually draws Investment.

Idoko & Taiga (2018) looked at the impact of Foreign Direct Investment (FDI) on the expansion of the manufacturing sector in Nigeria from 1981 to 2016. Two objectives and research questions served as the study's compass. The study's hypotheses were tested using the Vector Auto Regression (VAR) method and the Johansen Co-integration test. The results of the empirical VAR analysis using the impulse response function and variance decomposition test reveal that FDI had a marginally positive impact on Nigeria's manufacturing sector output. According to the Co-integration test's findings, FDI and the expansion of Nigeria's manufacturing sector have a long-term relationship.

Using the disaggregated components of industrial productivity, i.e. (Industrial, Manufacturing and Mining sector productivity indices), as proxies for the dependent variables, Kanu, Nwaimo, Onyechere, and Obasi (2017) evaluated the contribution of FDI to industrial productivity in Nigeria. In conjunction with other independent and control factors that are thought to have an impact on the level of industrial productivity, these were regressed against Foreign Direct Investments and expressed as a function of Gross Domestic Product. The study's findings suggest that FDI is not the main driver of industrial productivity in Nigeria. Nonetheless, it was discovered that, at a 5% Alpha level over the short term, FDI has a strong and favorable link with Nigeria's mining industry productivity. Given that the oil industries are a part of this sector, this was not unexpected. The oil sector is primarily where FDI has an impact. Any potential spillover effects from FDI to the larger economy are hampered by the fragile link between the oil sector and the rest of the economy. The study comes to the conclusion that we have not been justified in our excessive reliance on foreign direct investments as a source of economic growth and industrial productivity. Even though I've said it before, we shouldn't be entirely dependent on foreign direct investments.

Using the OLS approach, Danmola, Olateju, & Aminu (2017) investigated the effects of FDI on the Nigerian manufacturing sector. The study finds that FDI in the manufacturing sector has a statistically significant positive impact on manufacturing output. The implementation of liberalized industry and trade policies by the Nigerian federal government is another factor supporting the efficiency of its economic policy. These measures were implemented in order to increase productivity and efficiency as well as the competitiveness of Nigeria's industrial sector. The policy conclusion is that boosting foreign investment in the manufacturing sector requires favorable local investment in order to maintain sustainable economic growth and development. Nigeria should continue to promote FDI inward, but make an effort to direct it toward the manufacturing sector to hasten the diversification process. Also, the execution of the trade liberalization policy needs to be carefully considered.

**METHODOLOGY**

**Model Specification**

In order to determine the relationship between foreign direct investments and Nigeria's manufacturing sector performance, this study employs an econometric methodology. The ARDL approach was chosen because it stands out from the competition in a special way. Since that FDI is not the only factor affecting an economy's manufacturing performance, the study, subject to data availability, has incorporated such independent factors that are relevant to manufacturing output into the model. Consequently, the study model is specified as;

$$MPF = FDI + INT + GCE + EXR + DOP \dots\dots\dots \text{eq 1}$$

The eq 1 is the functional form of the model. The stochastic form of the model can be expressed as:

$$MPF_t = \beta_0 + \beta_1 FDI_t + \beta_2 INT_t + \beta_3 GCE_t + \beta_4 EXR_t + \beta_5 DOP_t + e_t \dots\dots\dots \text{eq 2}$$

Where;

MPF = Manufacturing performance, FDI = Foreign Direct Investment, GCE = Government Capital Expenditure, INT = Interest Rate, EXR = Exchange Rate, DOP = Degree of Openness,  $e_t$  = stochastic error term which captures other variables that are not included in the model.,  $\beta_0$  = intercept,  $\beta_1 - \beta_5$  are the slope of the coefficients.

The eq 2 is further transformed using logarithm so as to enable the coefficients of the variables to be interpreted as elasticities. As such, the transformed model is given as:

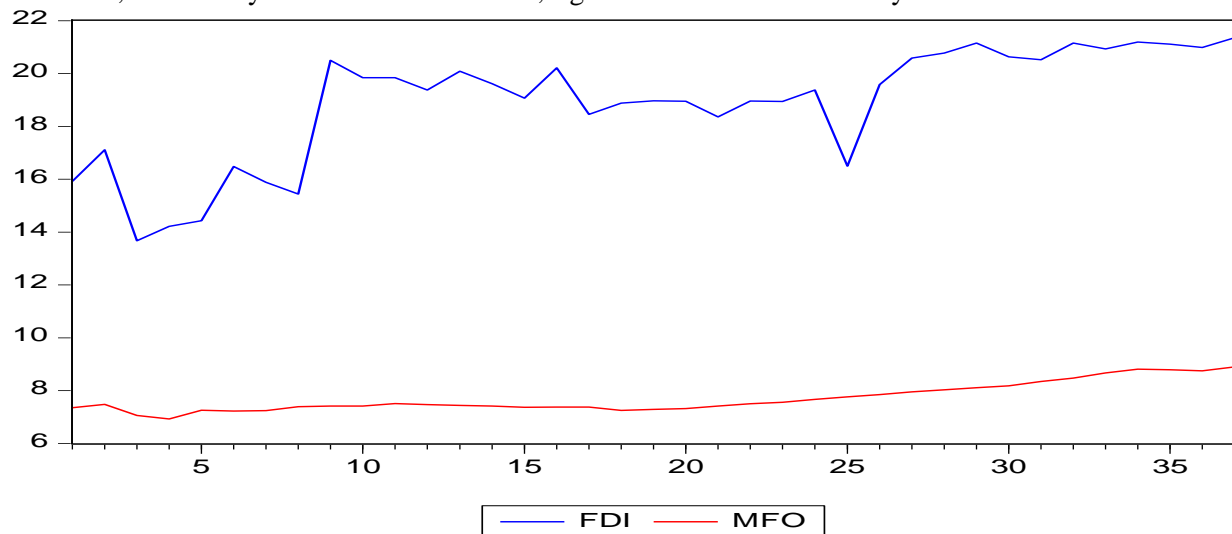
$$\Delta \ln MPF = \alpha_0 + \sum_{i=1}^p \alpha_{1i} \Delta \ln MPF_{t-1} + \sum_{i=1}^q \alpha_{2i} \Delta \ln FDI_{t-1} + \sum_{i=1}^q \alpha_{3i} \Delta \ln INT_{t-1} + \sum_{i=1}^q \alpha_{4i} \Delta \ln GCE_{t-1} + \sum_{i=1}^q \alpha_{5i} \Delta \ln EXR_{t-1} + \sum_{i=1}^q \alpha_{6i} \Delta \ln DOP_{t-1} + \alpha_7 \ln MPF_{t-1} + \alpha_8 \ln INT_{t-1} + \alpha_9 \ln GCE_{t-1} + \alpha_{10} \ln EXR_{t-1} + \alpha_{11} \ln DOP_{t-1} + e_t \dots\dots\dots \text{eq 3}$$

Arising from the above specification,  $\Delta$  represent the first difference operator. Whereas p is the optimal lag length for the dependent variable, q is the optimal lag length for the regressors,  $\alpha_1, \dots, \alpha_6$  represent short-run dynamics of the model. Nonetheless, the long run elasticities are represented by  $\alpha_7, - \alpha_{11}$ .

**INTERPRETATION OF RESULTS**

**Trend Analysis**

The graph below shows the trend in manufacturing performance proxied by the manufacturing output and Foreign Direct Investment from between 1986 to 2021. In order to evaluate and project economic variables, trend analysis is essential. As such, figure 1 shows the trend analysis for the variables:



**Fig 1.** Trend of Manufacturing performance and FDI inflows to Nigeria

The trend revealed that foreign direct investment inflow in Nigeria is characterized by high volatility. It decreases as much as it rises. Though, the volatility in the FDI is more severe in the 1980's compared to later times. As such, according to Adejumo (2015), the country's political unpredictability, security issues, and the volatile character of the Nigerian economy over time may all be contributing factors to the FDI's continuous increase and decline.

Therefore, it has also been noted from fig 1, that the manufacturing sector's performance in the first twenty years, was not particularly impressive because it was characterized by some degree of steepness, or rising and falling. This sector's growth fluctuates up and down until about the year 2000. Impressively, as seen by the upward movement of the trend, the manufacturing sector started to experience a rising stable growth rate in 2000. This goes on until 2013, when there was again another output decline, though not as severe as the prior one. It is clear from the trend analysis that manufacturing has underperformed over the years. This underwhelming performance may be attributed to the manufacturing sector's substantial infrastructure restrictions, as well as government failure to create forward and or backward-integration within the economy to enable the manufacturing sectors to thrive.

### Unit Root Test Results

**Table 1: Augmented Dickey-Fuller Unit Root Test**

Variables	ADF Stat.	Critical Value (5%)	Order of Integration	Prob
MPF	-3.113103	-2.738310	I (1)	0.0254
FDI	-6.447364	-2.961121	I (1)	0.0000
EXR	-3.358331	-2.752151	I (1)	0.0056
INT	-7.406229	-2.840142	I (0)	0.0032
DOP	-7.132594	-2.662120	I (1)	0.0000
GCE	-7.520117	-2.722211	I (1)	0.0000

*Source: authors computation, eviews 10, 2023*

Table 1 displays the stationarity property of all the variables utilized in this study. The decision rule states that if the ADF statistic is below the crucial level, the null hypothesis would be rejected, indicating that there is no unit root, and if it is greater than the critical level, there is a unit root. As such, the interest rate (INTR) is stationary at level I(0), according to the ADF result summary, while the remaining variables are stationary after first difference I. (1). Based on this finding, the alternative hypothesis can be accepted in place of the null hypothesis, which states that there is no unit root. The p-values for all the variables that are less than 0.05 (i.e. at the 5% level of significance) provide additional proof of stationarity. The use of the bound test (ARDL) is advised because the variables are of mixed order (Pesaran, et al. 2001).

### Lag Selection Criteria

**Table 2: Model Selection Criteria Table**

Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
2	28.342901	-1.167166	-0.912096	-1.120655	0.893379	ARDL(1, 0, 0, 0, 0, 0)
1	28.615496	-1.271186	-0.813371	-1.050161	0.892157	ARDL(2, 0, 0, 0, 0, 0)

*Source: authors computation, eviews 10, 2023*

The model lag selection criteria are shown in table 2, and the most prevalent lag criteria are as follows: Recall that Log L stands for Log-likelihood, AIC for Akaike Information Criterion, BIC for Bayesian Information Criterion, and HQ for Hannan-Quinn Information Criterion. The Akaike (AIC) criteria with

the optimal lag 2 will be chosen as a general rule because it provides the lowest value (-1.271186) among the other criteria. Consequently, the lag 1 for the ARDL regression will be used in this investigation.

**Cointegration Test Results**

The next step after determining the order of integration of the variable is to apply a bound F-test in order to establish a long-run relationship among the variables. The results of the bounds test for ARDL co-integration approach alongside critical values are reported in Table 3:

**Table 3: Summary Result of the Bound test**

F-statistic	4.655021	K= 5
Critical Value Bounds		
<b>Significance</b>	<b>I(0) Bound</b>	<b>I(1) Bound</b>
10%	2.26	3.35
5%	2.62	3.79
2.5%	2.96	4.18
1%	3.41	4.68

**Source:** *author's computation, eviews 10, 2023*

The ARDL test result indicates that there is a long-term relationship between the dependent variable, Manufacturing Performance (MPF), and the independent variables, Foreign Direct Investment (FDI), and Degree of openness (DOP), Exchange rate (EXR), Government Capital Expenditure (GPE), and Interest rate (INT). The calculated F-statistics (4.655021) is greater than the upper critical bound at 5% level of significance (i.e.,  $4.65 > 3.79$ ). The null hypothesis of no co-integration can therefore be rejected based on the findings.

**Interpretation of ARDL Regression Results**

**Table 4: Summary of the ARDL Regression Result**

Dependent Variable: MPF					
Variable	Coefficient	Std. Error	t-Statistic	Prob.*	
MPF (-1)	0.721072	0.086757	10.11570	0.0000	
FDI	0.221702	0.124680	0.911232	0.0321	
EXR	0.021437	0.000671	1.556433	0.1106	
INT	-0.040113	0.005672	-0.624253	0.4221	
DOP	-0.015061	0.075243	-0.142491	0.7603	
GCE	0.045627	0.000733	-3.911531	0.0340	
C	0.721164	0.617181	0.818194	0.0271	
R-squared	0.855612	Durbin-Watson stat		2.138582	
Adjusted R-squared	0.851234	F-statistic		114.7392	
		Prob(F-statistic)		0.000000	

**Source:** *authors computation, eviews 10, 2023*

The coefficient of determination R-squared, quantifies the strength of the relationship between the independent and dependent variables. The degree of openness (DOP), exchange rate (EXR), government capital expenditure (GCE), interest rate (INT), and foreign direct investment (FDI) together account for around 76% of the variation in manufacturing performance (MPF), according to the regression's  $R^2$ , which is 0.855612. Just 14% of the total is unaccounted for, and the error term e is thought to account for this. It is stated that the adjusted  $R^2$  is 0.855612. This indicates that the adjusted  $R^2$  accounts for about 86% of the systematic variation in the dependent variable after degree of freedom adjustment.

More so, the F-ratio with the value of 114.7392 shows that the model easily passes the F-test at 5% level of significance and this means that the hypotheses of a significant linear relationship between the dependent and independent variables taken together is validated.

Holding other independent variables constant, the coefficient of the past value of Manufacturing Performance measured by manufacturing output MPF (-1) is positive (0.721072), indicating that an increase in the past value of MPF will result in an increase in its current value of 0.72 percent. Nonetheless, because the p-value 0.0000 is less than 0.05 and the significance level is 5%, this influence is statistically significant.

The coefficient of foreign direct investment (FDI), exchange rate (EXR) and government expenditure (GCE) have a positive sign. The co-efficient values of 0.221702, 0.021437 and 0.045627 respectively, suggests that a 0.2%, 0.02% and 0.04% increase in manufacturing performance will result from a 1% increase in foreign direct investment, exchange rate and government expenditure. Consequently, the coefficient of FDI and GCE were found to be statistically significant given their p-values, which is less than 0.05 percent. Hence, suggesting that FDI and GCE significantly influenced manufacturing performance than the coefficient of EXR for the period under review. Giving the non-statistically significant outcome of the EXR, it can be inferred that exchange rate (EXR) is not a critical factor influence manufacturing production in Nigeria. As such, exchange rate can be said to have little bearing on manufacturing output.

Moreover, the coefficient of DOP and INT exerts negative influence on manufacturing performance (MPF). Thus, the coefficient of -0.015061 and -0.040113 shows that a unit increase in DOP and INT by 1 percent will result in a 0.02 and 0.04 percent decrease in MPF. As such, a rise in interest rates will reduce the nation's capacity for production, which will negatively impact manufacturing performance via the channel of its output. This is due to the fact that rising interest rates will deter manufacturers and potential investors from borrowing money from financial institutions, decreasing their chances of increasing production. The predicted value of the dependent variable when the independent variables are zero is the constant (C), commonly referred to as the intercept. Therefore, the intercept of 0.721164 shows that the manufacturing output is increased by about 0.72 percent when all of the independent variables: Foreign Direct Investment (FDI), Degree of Openness (DOP), Exchange Rate (EXR), Government Capital Expenditure (GCE), and Interest Rate (INT) have a value of zero.

### Post-estimation Test

**Table 5:** Heteroscedasticity Test: ARCH

F-statistic	0.000933	Prob. F(1,33)	0.9758
Obs*R-squared	0.000983	Prob. Chi-Square(1)	0.9749

*Source: authors computation, evIEWS 10, 2023*

Table 5 reports the diagnostic test for heteroscedasticity using the ARCH heteroskedasticity. The ARCH test for Heteroscedasticity presented in table 6 shows that the variance of the error is Homoscedastic at 5% level of significance. Since the probability value of 0.9758 is greater than 0.05, the study therefore fails to reject the null hypothesis that the error variance is Homoskedastic. This means that the variance of the error term is constant.

**Table 6: Breusch-Godfrey Serial Correlation LM Test**

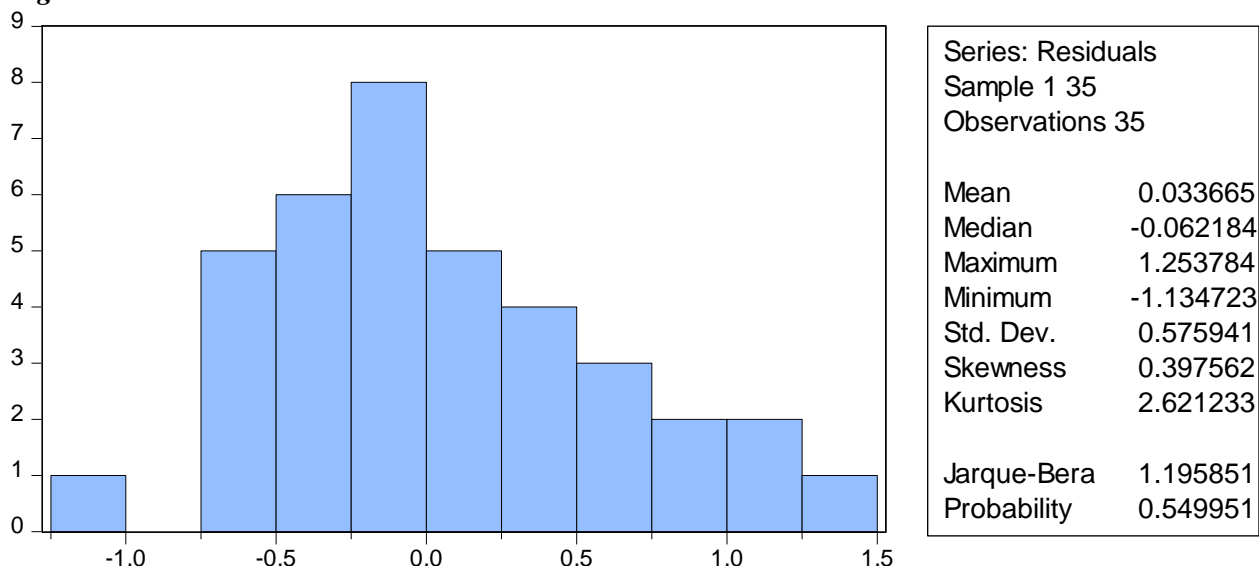
F-statistic	0.311243	Prob. F(1,28)	0.5654
Obs*R-squared	0.406310	Prob. Chi-Square(1)	0.5128

*Source: authors computation, evIEWS 10, 2023*

The Breusch Godfrey Serial Correlation LM results show that the probability value of 0.5654 is greater than the test statistic of 0.05. Thus at 5% level of significance, the study therefore fails to reject the null hypothesis that there is no serial correlation. The Breusch-Godfrey serial LM test shows that there is no serial correlation between errors.

### Normality Test

Fig 2.



The Jarque-Bera is 1.195851 and the probability of obtaining such a statistic under the normality assumption is about 0.55. Going by the decision rule, the null hypothesis cannot be rejected, therefore, it can be concluded that the error term is normally distributed. Also, looking at the histogram as shown in figure 2, it can be seen that the residual is normally distributed.

### CONCLUSION AND RECOMMENDATIONS

The findings revealed that a positive relationship exists between manufacturing performance and FDI, therefore showing that FDI has an impact on manufacturing performance in Nigeria. Also, the cointegration test revealed that a long run relationship exists not only between Manufacturing performance and foreign direct investment, as well as all other independent variables in the study (Exchange rate, Government Capital Expenditure, Interest Rate, and Degree of Openness).

Consequently, the study established that FDI is statistically significant and has a positive impact on manufacturing performance. FDI is a useful tool for economic development. Several economies have enjoyed from its benefits, which is why attracting FDI has become very important to most developing countries because of its positive impact on every sector of the economy and most especially the manufacturing sector. In Nigeria particularly, several policies including trade openness, infrastructural development, stabilization of the exchange rate, privatization of government owned enterprises and so on have been adopted all in a bid to attract more foreign investors. The study therefore recommends that since Interest Rate has a negative impact on manufacturing performance. As such, the Federal Government through the help of the monetary authority work out appropriate rate of interest charged on loans advanced to the commercial banks to encourage more domestic and foreign investors in the manufacturing sector. More so, bank of industry needs to be re-energized and upgraded to meet up with the financial need of the contemporary industrial age in Nigeria.



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