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Effect Of Inward Foreign Direct Investment On Manufacturing Capacity Utilisation In Nigeria

Newman C. Oputa, Phd

Abstract
This study employed the Auto-Regressive Distributed Lag (ARDL) approach and the error correction (ECM)-ARDL model to investigate the impact of foreign direct investment inflow on manufacturing capacity utilization (MCU) in Nigeria during the period 1980 – 2020. The co-integration test showed that the variables were co-integrated and the model analysis revealed the existence of long-run relations between the dependent variable MCU and the explanatory variable FDI. The empirical results further revealed that past foreign direct investment flows positively and significantly influenced manufacturing capacity utilization in Nigeria. The error correction model (ECM) showed a 74.1 percent speed of adjustment which implied a longer period for restoration of equilibrium in the model and reflected the weak utilization of manufacturing capacity by the FDI enterprises. We therefore, recommended that FDI enterprises should be encouraged to increase their capacity utilization especially using local inputs as raw materials for their production process.

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I. Introduction

The industrial sector of the Nigerian economy consists of the activities in the manufacturing; mining and quarrying; as well as, power and utilities sub sectors (CBN, 2010). The manufacturing sub-sector is a major recipient of private capital inflows in the form of foreign direct investment (FDI, which are used for either the establishment of greenfield enterprises or the increase in equity capital of existing firms. FDI flows provide the capital and foreign exchange needs for business enterprises, as well as, fill the gaps in technological knowledge, innovations in production, entrepreneurial, managerial and personnel skills.

There is a dearth of studies on the subject matter of this paper in Nigeria, however the few empirical investigations by Eniekezimene and Cookey, 2020; and Obi-Nwosu, Ogbonna, and Ibenta, 2019; had revealed a positive pass through from FDI to manufacturing capacity of domestic enterprises. Numerous works in the past, had most often, concentrated on the impact of FDI on domestic growth, manufacturing output and employment levels with mixed results, thereby making studies in this area inconclusive. Nigerian economy has a huge potential to attract FDI in the extractive mineral sector; agriculture; infrastructure; tourism; communication; financial services; and the social sector.

The manufacturing sub-sector as a major component of the industrial sector has its major performance indicators to include manufacturing output and value-added, manufacturing capacity utilization (MCU), index of manufacturing production and the employment generated in the sub-sector. In Nigeria, the composition of the sub-sector consisted of thirteen product groups, namely: sugar confectionery, soft drinks, beer and stout, cotton textiles, synthetic fabrics, footwear, paints, refined petroleum, cement, roofing sheets, vehicle assembly, soap and detergent, as well as, radio and television (CBN, 2010). Nigeria manufacturing sub-sector comprised of small scale and micro-industries, as well as, the medium and large scale industries.

The flow of FDI into Nigeria which averaged US$ 0.32 billion in the 1970s rose to US$ 0.43 billion in the 1980s and further increased to US$1.5 billion in the 1990s. It averaged US$4.2 billion in the 2000s, before reaching a peak of US$ 8.9 billion in 2011, but trended downwards to an estimated US$3.3 billion and US$2.39 billion in 2019 and 2020, respectively (CBN, 2008 & 2020). The manufacturing capacity utilization which averaged 77.1 percent in the 1970s, declined drastically to 47.4 percent and 34.3 percent in 1980s and 1990s, respectively. It improved to 53.6 percent in the 2000s, peaked at 59.9 percent in 2015, then declined slightly to 49.0 percent in 2016, before resuming an upward trend to 52.0 percent, 55.0 percent and 55.6 percent in 2017, 2018, and 2019, respectively (CBN, 2008 & CBN, Annual reports 2009-2020).

The manufacturing sub-sector in Nigeria had performed dismally over the years, bedeviled by paucity of investable funds and acute scarcity of foreign exchange resources for foreign raw material and machineries, which capital inflows in the form of FDI could provide in the production processes. FDI flows come in handy to fill the identified financing gaps, and upscale the poor state of infrastructure. All these have made the manufacturing performance sub-optimal and therefore required the build-up of capacities in the sub-sector to increase manufacturing output and competitiveness.

The main objective of this paper included to: ascertain the effect of FDI on MCU in both the long-run and short-run, and examine the directional relationship between these variables. Thus we established two hypotheses namely, $\mathbf{H_o1}$: FDI has no significant effect on manufacturing capacity utilization in Nigeria; and $\mathbf{H_o2}$: There exist no causal relationship between FDI and MCU in Nigeria.

Following this introduction, the rest of the paper is divided into conceptual issues and review of empirical literature in Section 2, data and research methodology, and analysis of the results and in Section 3 while Section 4 concludes the paper with recommendations.

II. Conceptual Issues And Review Of Empirical Literature

Conceptual issues

Foreign Direct Investment (FDI) flows comprise the movement of private capital out of capital surplus economies mostly developed countries into capital deficit economies (developing countries). They are made by business entities (enterprises) from abroad in controlling business relationships with firms in another country referred to as the host country. These are basically equity and debt financial flows from external or foreign entities for the establishment of new businesses or plough into existing enterprises with threshold of equity shares put at ten percent and above (IMF, 2008).

Manufacturing capacity utilization(MCU) is a measure of how a country, or industries or firms make use of all resources available to them to produce optimally in the economy. Capacity utilization is the manufacturing capabilities or the productive capacity of business enterprises in the economy at a given period. It shows the relationship between output produced with the given resources and the potential output that can be produced if capacity was fully used and is expressed in percentage. An optimal benchmark rate of 85% has being set for most business firms, which is set for manufacturing firms that produces physical goods as against service industries (CBN, 2001).

Review of empirical literature

In Nigeria, there are no recent empirical work that used data spanning beyond 2018 on FDI spillover effects on manufacturing capacity utilization and the absorptive capacities of domestic industrial sector. Studies on FDI and the Nigerian economy have continued to focus on the impacts of these flows on economic growth especially manufacturing output, ignoring the absorptive capacities in the economy.

Saha (2024) focused on FDI and labour productivity, as well as incorporated the significant effects on productivity capacity index in FDI host economies. The paper deplored the dynamic panel threshold technique with data from 88 countries and found that while FDI impacts productivity capacity, its spillover effects will increase labour productivity in any economy. The study noted that productivity capacity index has a threshold upon which FDI impacts on labour productivity and propel positive spillovers on the host economies. In same vein, Zhang (2021) paper on the South- South FDI spillover effects of Chinese firms to African economies revealed that large Chinese firms' private capital flows to Africa's infrastructural sector did not only contribute to growth in GDP but enhanced the host countries' absorptive capacity in attracting and utilizing foreign capital inflows.

Mim, Hedi and Ali (2022) posited that inward FDI flows are catalyst for industrialization in any economy. Their paper examined, the impact of FDI of host countries' absorptive capacities using a panel structured SGMM estimates of 46 African countries including Nigeria. They further, improved their two-threshold relationship estimates and analysis between FDI and industrial output by applying a Panel Corrected Standard Errors (PCSE) estimation technique. The PCSE estimates are robust in obtaining the cross-country heteroscedasticity and auto-correlation in panel studies. Their findings revealed that weak countries with high absorptive capacities are more advantageous in gaining from FDI spillover effects. They concluded that insufficient FDI flows are not beneficial to domestic firms especially where there are poor absorptive capacity.

Sugiharti, Yasin, Purwono and Esquivias (2022), examined the FDI spillover effects on firms in the Indonesia manufacturing sub-sector, employed a time-varying stachastic production fronitier analysis. They found that firms in Indonesia benefited from FDI due to their high technological absorption capacities. They suggested that governments should always ensure that host country's firms absorb the technological capacity of FDI enterprises which have positive spillover effects of increasing productivity, employment generation and technological transfer.

Eniekezimene and Cookey (2020) investigated the effect of manufacturing FDI (MFDI) on manufacturing capacity utilization (MCU) using time series data for the period 1981 to 2018. This paper was an improvement on most other works in this area as it specifically used MFDI as against the widely used aggregated FDI. The technique deplored in their paper was the vector error correction model (VECM). The result showed the existence of long-run relationships between FDI and MCU, but contrarily to the a priori expectation, the log of manufacturing FDI was negatively related to MCU in the long-run and the authors noted that this result suggested further investigations. They attributed the outcome to FDI in manufacturing sector crowding out local manufacturing firms.

Obi-Nwosu, Ogbonna, and Ibenta (2019) investigated the impact of foreign direct investment on manufacturing capacity in Nigeria for the period 1984 to 2017. They used the multiple (OLS) regression techniques and established a strong long-run co-integration relationship between FDI and the explanatory variables, which included the MCU. The result further revealed that both FDI and exchange rate impacted significantly on manufacturing capacity utilization in Nigeria. They concluded that FDI played a significant role on manufacturing capacity in Nigeria and recommended improvement on the investment climate for existing domestic and foreign investors as well as tackle the serious security issues bedeviling the nation.

III. Data And Methodology

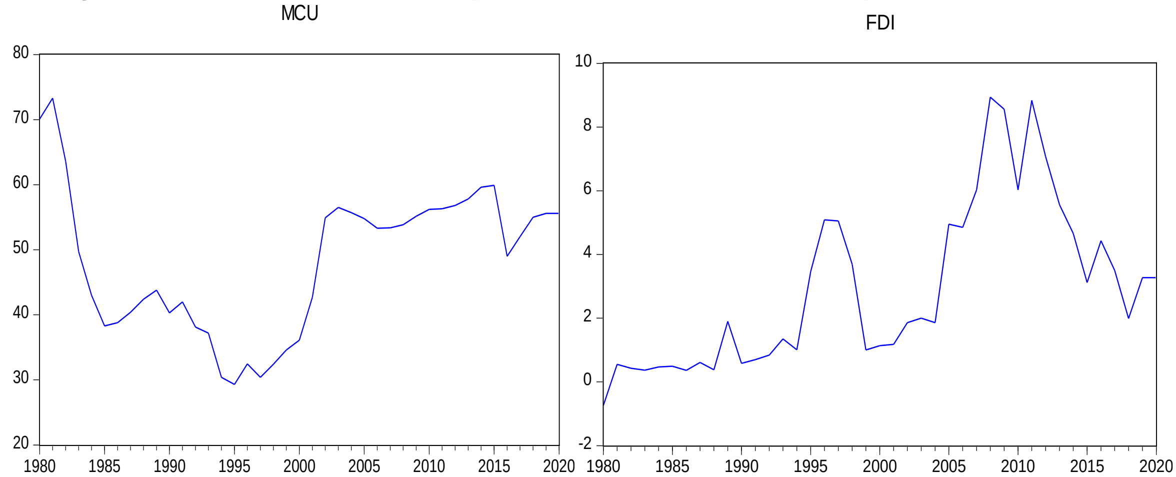
Sources of Data and Analysis

The main source of data was from the Central Bank of Nigeria (CBN) Statistical bulletin and National Bureau of Statistics (NBS). The time series plots of manufacturing capacity utilization (MCU) and foreign direct investment (FDI) are presented in Figure 1.

The manufacturing capacity utilization (MCU) declined steadily from 1981 to 1995, attributable to combination of factors which include economic and political instability. The economic factors include lack of working capital, poor access to loanable funds and high cost of fund, foreign exchange constraints, poor infrastructure especially epileptic power, and continuous depreciation of the naira to US dollar exchange rate (CBN, Annual Report 1995). The renewed efforts by the Government to promote non-oil sector manufacturing resulted in moderate performance in the remainder of the period.

The plot of the time series trend of the independent variable (FDI) showed some mixed outcomes with notable spikes. The trend in FDI was moderate during the 1980s, then a spike in the early 1989, due to the liberalization of the economy, occasioned by the adoption of the structural adjustment program (SAP, 1986), it dropped between 1990 -1994 as the economy witnessed some form of regulations. FDI flows trended upwards thereafter with another huge surge in 1995 to 1997, followed by another fall from 1998 through 2004. Remarkable private capital flows in the form of FDI was experienced in

Figure 1: Time Series Plots of the Dependent Variable (MCU) and independent Variable (FDI)



The economy between 2005 to 2009, due to the massive liberalization in the telecommunication sector, as well as the banking sector consolidation. Like most developing and emerging economies, the experienced growth was distorted by the global economic crisis of 2008-2009, as the FDI flows dropped in 2010 -2020. Most of these countries are yet to recover from this shock and require aggressive investment friendly environment to resuscitate FDI flows into their economies (CBN, Annual Reports, 2010 -2020).

Methodology

The paper utilized the auto regressive distributed lag (ARDL) approach and the error correction model (ECM) for the empirical investigation. The pre-estimation tests included the unit root tests of both the augmented Dickey-Fuller (ADF) and Phillips-Peron (PP); the determination of the lag length; and co-integration analysis. The econometric package used in the model estimation was E-Views 11.

Model Specification

The ARDL model used in the paper is of the form:

$$MCU = \beta_0 + \sum_{i=1}^{m} \beta_1^i MCU_{t-i} + \sum_{i=1}^{m} \beta_2^i FDI_{t-i} + \beta_3 \Delta MCU_{t-i} + \beta_4 \Delta FDI_{t-i} + v_t --(1)$$

Where:
MCU = Manufacturing Capacity Utilization
FDI = Foreign Direct Investments
β_o = Intercept or autonomous parameter estimate
$\beta_{1\text{-}4}$= Coefficients of the variables
v_t = The residuals or error terms.

Once a long-run association was established between the variables, we proceeded to examine the short-run dynamics using restricted Error Correction Model (ECM) approach as presented below:

$$\Delta MCU_t = \beta_0 + \beta_1 \Delta MCU_{t-1} + \beta_3 \Delta FDI_{t-i} + \xi ECT_{t-1} + v_t ----------(2)$$

The ξ (known as one period lagged error correction terms) captured the output evolution process by which agents adjusted for prediction errors made in the last period while ECT_{t-1} represented the output evolution process by which agents adjusted for prediction errors made in the last period.

IV. Results And Findings

Unit Root Analysis

Table 3.1 presented the results of the unit root of the variables using the Augmented Dickey-Fuller (1979, 1981), Phillips-Peron (1988) and MPSS test of Malinowski-Phillips-Schmidt-Shin (1992) techniques. The rational for this test was to avoid spurious regression that could mislead policy decisions. The unit root test results showed that the two variables (MCU and LFDI) were stationary after taking their first differences. The stationarity test was obtained by comparing the t-statistics with the critical values, when the t- statistic is greater than the critical values, the variable is deemed stationary but when the reverse, then non stationary. However, the error correction term (ECM_{t-1}) are stationary at levels at the one percent level of significance for the ADF and PP tests, while it is significance at 5 percent level for the MPSS test. Thus, the model follows integrating process.

Table 3.1: Stationarity test

	ADF		PP		MPSS		Decision
	Levels	**1st Diff**	**Levels**	**1st Diff**	**Levels**	**1st Diff**	
MCU	-2.031	-4.114**	-2.204	-4.176**	0.243	0.525**	I(1)
LFDI	-1.874	-8.283**	-1.725	-8.269**	0.094	0.605**	I(1)
ECM^{MCU}_{t-1}	-6.496***	-7.396***	-6.493***	-21.207***	0.869**	0.762**	I(0)

*Notes: ***, **, * means the rejection of the null hypothesis at the 1%, 5% and 10% level of significance, respectively. The null hypothesis is that each variable has a unit root. ADF test indicates Augmented Dickey-Fuller test, PP test indicates Phillips-Peron test and MPSS test indicates Malinowski-Phillips-Schmidt-Shin test.*
Source: Author's computation using E views.

Lag length criteria

In order to determine whether there exist any co-integrating vector supporting the existence of long-run relationship between the dependent variable (MCU) and the independent variable (FDI), we employed both unrestricted VAR and the ARDL bounds tests to determine the lag length. Inappropriate lag lengths reduce the reliability of the model and leads to incorrect estimation results. The Akaike information criteria (AIC) was adopted to choose the appropriate lag length. The model with the lowest AIC value was accepted. Both the VAR lag order and ARDL bound established a lag length of two for the model MCU, LFDI (2, 0).

Table 3.2: VAR lag order selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
MCU						
0	-176.697	NA	70.238	9.927	10.015	9.958
1	-123.682	97.192*	4.837	7.248	7.688	7.402
2	-120.475	5.524	4.616*	7.204*	7.468*	7.296*
3	-119.566	1.463	5.781	7.420	8.036	7.635
4	-116.500	4.599	6.160	7.472	8.264	7.748

LR: Likelihood ratio; FPE: Final prediction error; AIC: Akaike information criterion; SC: Schwarz criterion; HQ: Hannan-Quinn criterion. * Optimal length.
Source: *Author's computation using E views.*

Co-integration analysis

With assertion of the stationarity status of the variables, we applied the ARDL bound test approach by Pesaran, Shin and Smith, (2001), to investigate the presence of co-integration in the long-run relationships between MCU and FDI in the Nigerian economy. The results of the ARDL co-integration test are shown in Table 3.3

Table 3.3: Co-integration test

Estimated model	Bond test for Co-integration test		Diagnostic Test		
	Optimal lag length	F-Statistics	Normality (Prob)	X^2 Serial	X^2 Heteroskedasticity
F_{MCU}(LFDI)	(2, 0)	7.0551	0.2179	0.5666	0.9468

Source: Author's computation using E views

The results above, revealed that there is one co-integrating vectors (with the F-statistics exceeding the lower and upper critical bounds at the 5 percent level of significance), thus, confirming the existence of long-run relationships among the variables. Therefore, there exist causation relationships that runs at least from one variable to another.

Test Results of Hypothesis

The results of the estimated long-run equilibrium relationship revealed a direct link between the dependent variable (MCU) and explanatory variable (FDI) in Nigeria. The FDI coefficients were significant and statistically optimal.

Test of Hypothesis I

H₀ 1*: FDI has no significant effect on manufacturing capacity utilization in Nigeria*

Long-run Result

The result of the long-run equilibrium relating to manufacturing capacity utilization revealed that the signs of all the long-run coefficient of MCU was positive for the lag 1 period (MCU(-1) but turned negative in the next lag period MCU (-2). Considering the explanatory variable (FDI), it implies that MCU increases as FDI grows. The long-run elasticity for LFDI was 29.853, meaning that a one percent increase in FDI would result in a significant increase of 29.85 percent in manufacturing capacity utilization. In addition, the result revealed high significant level for the one period lag of MCU as shown by the high t-statistics and the zero level of the probability value.

Table 3.4: MCU Estimated long-run coefficients using ARDL-ECM model

Variable	Coefficient	Std. Error	t-Statistic	*p*-value.
Selected Model: ARDL(2, 0); Dependent Variable (MCU)				
C	7.624	3.029	2.516	0.0169
MCU(-1)	1.202***	0.157	7.670	0.0000
MCU(-2)	-0.381***	0.138	-2.763	0.0093
LFDI(-1)	29.853***	5.180	5.763	0.0000
LFDI(-2)	1.069	1.156	0.924	0.3617

*Note: ***, **, * denotes the rejection of null hypothesis at the 1%, 5% and 10% level of significance, respectively.*

R-squared = 0.869154; Adjusted R-squared = 0.853294; Mean dependent var. = 46.676840; S.D. dependent var.= 9.720196

Source: Author's computation using E views

This finding was in line with extant literature and the outcomes of the works of Obi-Nwosu, Ogbonna and Ibenta (2019); and Adamu, and Barde, (2012) that established positive and long run relationship between MCU and FDI in Nigeria.

Short-run Result

Table 3.5, showed the results of the short-run dynamic coefficient from the error correction model (ECM). The ECM (-1) coefficient was significant at 5 percent level with

Table 3.5: MCU Estimated Short-run coefficients using ARDL-ECM

Variable	Coefficient	Std. Error	t-Statistic	Probability
Pane B; Selected Model: ARDL(2, 0); Dependent Variable is ∆MCU				
C	0.2240	0.6049	0.3703	0.7137
∆MCU(-1)	0.8818***	0.3541	2.4896	0.0184
∆MCU(-2)	-0.2198	0.1993	-1.1024	0.2788
∆LFDI(-1)	0.6246**	0.1587	3.9350	0.0578
∆LFDI(-2)	0.5735**	0.1618	3.5450	0.0815
ECM(-1)	-0.7413**	0.3965	-1.8697	0.0710
R-squared	0.7217	F-statistics		3.3067
Adjusted R-squared	0.6552	Probability (F-statistic)		0.0480
S.E. of regression	4.3393	Durbin-Watson stat		1.6737
Notes: ***, **, * implies the rejection of null hypothesis at the 1%, 5% and 10% level of significant, respectively. ***Source: Author's own computation using E views***				

A negative sign which was between 0 and –1, thus, reconfirmed a long-run relationship among the variables. The result also showed that short-run deviations from the long-run equilibrium of a coefficient of 0.74, which means that 74 per cent of the disequilibrium in the long-run relationship between MCU and FDI was corrected in one year. Furthermore, any distortion in the system, equilibrium can be restored in about six years and two months. The overall findings revealed that FDI played a positive and significant role in stimulating manufacturing capacity utilization in the Nigerian economy.

Test of Hypothesis II: Granger Causality Test

H_o 2*: There exist no causal relationship between FDI and MCU in Nigeria*

We ascertain the direction of relationship through the Granger causality test which is complimentary to the co-integration analysis. This pairwise relationship can be one-way or two-way relationship or no relationship. The Granger causality test for the model is presented in Table 3.6. and revealed that inward inflow of FDI granger causes MCU as we reject the null hypothesis. The directional relationship is one-way and rightly situated the role FDI play in enhancing the level of manufacturing capacity in host economies. The findings from this study are in consonance with that of Afolabi, Laseinde, Oluwafemi, Atolagbe and Oluwafemi, (2019). The Granger causality test further confirms that the inclusion of FDI with MCU in the model was justified.

Table 3.6: Granger Causality test

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision
MCU Model				
FDI does not Granger Cause MCU	33	7.46154	0.0024**	Reject H_o
MCU does not Granger Cause FDI		0.78740	0.6208	Accept H_o
*Notes: *, **, *** means the rejection of the null hypothesis at the 10%, 5% and 1% level of significance, respectively.* **Source:** *Author's computation using E views*				

Diagnostic and stability tests

The existence of co-integration from equation (1), does not necessary imply that the estimated coefficients are statistically stable. To ensure the stability of the ARDL-ECM models, Pesaran, et al. (2001; 1999) proposed a test for the stability of the estimated coefficients based on the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMSQ) developed by Brown, Durbin, and Evans, (1975) and other tests such as serial correlation heteroscedasticity normal distribution Ramsey RESET statistics.

The diagnostic and stability tests were conducted for the model (LFDI, MCU) and the result shown in Table 3.7. The diagnostic test validate the reliability and significance for the model. The series association LM test shows the chi-square result of 2.3918 with a confidence value of 0.1067 for the model, which means we do not deny the null hypothesis. The tests of the heteroscedasticity reveal that in the data structures, there is no auto-regressive conditional heteroscedasticity with a statistics value of 0.0676 and a probability value of 0.9347 for MCU. The J-B check, which represents the normal distribution of the model, showed a statistical rating of 0.8813, reflecting normal distribution and therefore no anomalous evidence in the model, we then accepted the null hypothesis. The data stability from the Ramsey RESET test was applied and the result confirms that the data is structurally normal and has no sign of lag breaking for the model. We therefore accepted the null hypothesis of absence of mis-specifications in the model

Table 3.7: Diagnostic and stability tests

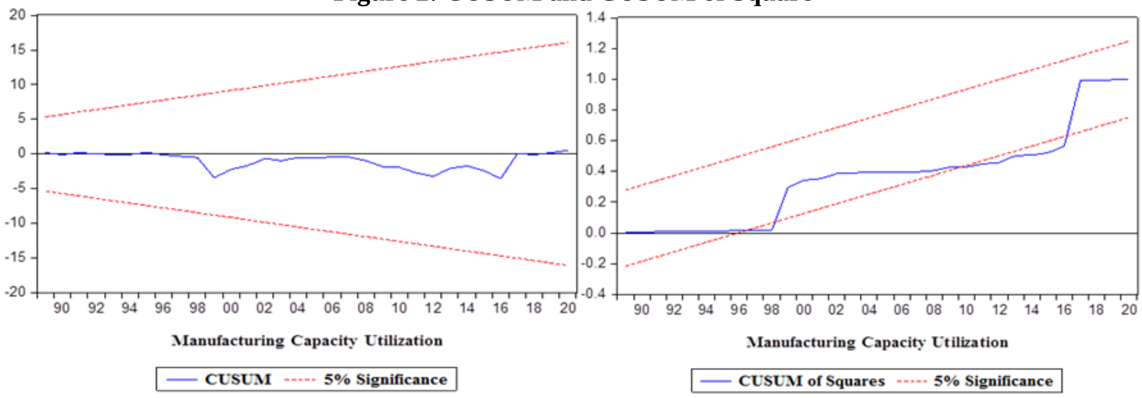
Test	H_o	*Statistics*	*p-value*	*Decision*
ARDL(2, 0); Dependent Variable is ΔMCU				
Serial Correlation	There is no serial correlation in the residual	2.3918	0.1067	Accept H_o
Heteroscedasticity	There is no auto-regressive conditional heteroscedasticity	0.0676	0.9347	Accept H_o
Normal distribution	Normal distribution	0.8813	0.5059	Accept H_o
Ramsey RESET	Absence of model misspecification	0.1036	0.9181	Accept H_o
Source: Author's computation using Eviews				

CUSUM and CUSUM SQUARE Stability tests

Further investigation of the model stability using the both the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests are presented in figure 2. These tests reveals changes in the regression coefficients in the form of breaks in the intercept and means of regression. When the ARDL model is stable it indicates that the estimators measure accurately the relationships between the co-integrated variables.

The plots in figure 2 show the long-term stability tests and short-term transfers of the ARDL Error Corrections pattern for the MCU model. When the plot estimates of CUSUM and CUSUMSQ lie within the 5 percent critical lines or the point of significance, then the null hypothesis is compatible and not dismissed for all coefficients of the regression. The null hypothesis can, therefore, be retained for the model. A review of Figures 2 reveals that estimates from CUSUM are so far below the level of confidence of 5 percent, which indicates a robust coefficient in both long and short runs in the ARDL error correction model. However, in the case of CUSUMSQ, some sections of the MCU plot, lie above the 5 percent level of significance during the period 2010 – 2016, which showed that there might be structural breaks and the regression may be facing instability during those period. Further investigation may require the deployment of dummy variables in the model to adequately capture these distortions.

Figure 2: CUSUM and CUSUM of Square



V. Conclusion And Recommendation

The study used the ARDL error correction model to investigate the impact of inward foreign direct investment (FDI) on manufacturing capacity utilization (MCU) in Nigeria spanning the period 1980 – 2020. The outcome established the significant FDI impact on MCU in both the long-run and short-run. With the significant impact of FDI to the Nigerian economy, we recommend that FDI enterprises should be encouraged to increase their capacity utilization especially using local inputs to produce optimally, as well as, increase employment of local labour resources.

In the most recent times not captured in this study, security challenges, government policies could affect investors' confidence thereby eroding inflow of foreign investment inflows and greatly dampen its impact on the manufacturing sector. Thus, it is obvious that government should tackle the current security challenges with all commitment, provide fiscal incentives and other investment friendly policy direction and embark on massive infrastructural development attract more FDI inflows. Since the cumulative sum of squares (CUSUMSQ) test revealed evidence of instability in particular years, a further research should be conducted on the instability to identify likely distortions.

Appendix 1				
Dependent Variable: MCU			**Long run**	
Method: Least Squares				
Date: 06/16/21 Time: 15:02				
Sample (adjusted): 1983 2020				

Included observations: 38 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.623281	3.029593	2.516272	0.0169
MCU(-1)	1.202003	0.156699	7.670801	0.0000
MCU(-2)	-0.381269	0.137975	-2.763318	0.0093
LFDI(-1)	29.853082	5.179692	5.763486	0.0000
R-squared	0.869154	Mean dependent var		46.676840
Adjusted R-squared	0.853294	S.D. dependent var		9.720196
S.E. of regression	3.723045	Akaike info criterion		5.589040
Sum squared resid	457.415100	Schwarz criterion		5.804512
Log likelihood	-101.191800	Hannan-Quinn criter.		5.665703
F-statistic	54.801460	Durbin-Watson stat		2.063767
Prob(F-statistic)	0.000000			

Appendix 2				
Dependent Variable: D(MCU)		**Short-run**		
Method: Least Squares				
Date: 06/16/21 Time: 15:45				
Sample (adjusted): 1984 2020				
Included observations: 37 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.224017	0.604908	0.370332	0.7137
D(MCU(-1))	0.881759	0.354181	2.489572	0.0184
D(MCU(-2))	-0.219796	0.199377	-1.102414	0.2788
D(LFDI(-1))	0.624578	0.158724	3.934994	0.0578
D(LFDI(-2))	0.573507	0.161777	3.545047	0.0815
ECM(-1)	-0.741301	0.396476	-1.869725	0.0710
R-squared	0.721696	Mean dependent var		0.159459
Adjusted R-squared	0.655220	S.D. dependent var		3.808604
S.E. of regression	4.339336	Akaike info criterion		5.558689
Sum squared resid	46.427600	Schwarz criterion		5.819919
Log likelihood	-96.835750	Hannan-Quinn criter.		5.650785
F-statistic	3.306718	Durbin-Watson stat		2.102333
Prob(F-statistic)	1.673715			

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