JETMASE
Journal of Emerging Trends in Management Sciences and Entrepreneurship
Volume 4(2), Pages 111-128, December 2022
ISSN: 2384-762X
https://www.jetmase.com

Manufacturing Sector and Economic Development of Nigeria

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ABSTRACT: Manufacturing has been viewed as the fastest channel for a country to achieve speedy development and reduce the rate of poverty in a country. As a result, the study explored the effect of manufacturing sector on the economic development of Nigeria. Annual data from 1999 to 2021 was obtained from Statistical Bulletin of Central Bank of Nigeria and was used to test the effect of explanatory variables (Average manufacturing capacity utilization; Manufacturing Production Index; Contribution of manufacturing sector to gross domestic product and Foreign direct investment) on the dependent variable (human development index). Auto Regressive Distributed lag models (ARDL) was employed to analyze the data and the result indicates that manufacturing sector has insignificant effect on human development index in Nigeria. The study therefore recommends the need to encourage local production while investing in infrastructures like power, water, roads and transportation. The study also recommends the need for manufacturing sector to have access to finance, also tax incentives should be given to manufacturers as this will encourage local investors and attract foreign investors.

Keywords: Manufacturing sector and human development index

INTRODUCTION

Nigeria as a nation is currently facing high unemployment rate, mortality rate, poverty rate, out of school children rate and poor health and educational facilities as such the world bank report 2020 refers to Nigeria as the poverty capital of the world. This has resulted to mass exodus of Nigerian youths outside the country for greener pastures and for a better standard of living therefore one will be forced to ask are there no jobs or manufacturing industries in the country.

Manufacturing industries are those that engage in the production and processing of goods and have a free hand in either the creation of new commodities or the addition of value (Adebayo, 2011, Nwanne, 2015). The manufacturing sector of any economy is widely regarded as the engine of growth and a catalyst for long-term transformation and

national development. This is due to its enormous potential as a tool for creating wealth, creating jobs, contributing to the country's GDP, and alleviating poverty among citizens (Simbo, Iwuji, & Bagshaw, 2012).

Manufacturing activities have a significant impact on a nation's economy. In developed economies, for example, they account for a sizable proportion of total economic activity. In Nigeria, the sub-sector accounts for approximately 10% of total GDP. Manufacturing activities employ approximately 12% of the labor force in the nation's formal economy. This is why manufacturing statistics are useful indicators of a country's economic performance (NBS, 2018). Manufacturing's contribution to total economic output in Nigeria has generally declined since a peak of 7.83% in 1982. Many factors have contributed to the variation in sector share over time, many of which demonstrate both manufacturing's vulnerability to global economic pressures and the effects that policy changes can have on reshaping the sector.

Prior to the 1970s oil boom, manufacturing contributed roughly 10% of Nigeria's economic output. Following that, increased oil revenues caused the sector's relative Gross Domestic Product (GDP) share to fall; growth continued, albeit at a lower rate. The recession caused by the fall in oil prices in the early 1980s prompted policymakers to shift their attention back to the manufacturing sector, with steel production taking center stage. Previously, the Nigerian Enterprises Promotion Decrees of 1972 and 1977 had changed the majority ownership of firms from foreign to Nigerian, limiting foreign capital inflows. The inability of imported goods to be affordable, combined with a lack of foreign capital and technology, encouraged domestic production of basic commodities such as soap and salt (NBS, 2018). In addition, price manipulation via export and import subsidies encouraged the importation of intermediary inputs, resulting in the expansion of the Assembly-based industry.

A brief increase in manufacturing output was observed in the early 1980s. It contributed 7.83% of total economic output. However, price manipulation discouraged domestic manufacture of inputs, as well as future investments in the infrastructure and human capital required to do so, and this share soon began to decline. Import bans on raw materials were imposed on 1987 as part of the World Bank's Structural Adjustment Programmes (SAPs), encouraging import substitution. Intermediary input manufacturers were able to compete again, and there were fewer plant closures. This, in conjunction with the Privatization and Commercialization Act of 1988, encouraged greater efficiency in manufacturing. Manufacturing's share of economic output increased by 0.62% points between 1986 and 1988. Nigeria continued to rely heavily on oil exports throughout the 1990s and 2000s, allowing production to decline. Firms were not export-oriented and were inefficient, causing competitive firms to relocate factories abroad. A few key industries, including beverages, textiles, cement, and tobacco, kept the sector afloat, but even these were operating at less than half capacity. Production is concentrated primarily in Lagos and its Umgebungs, and to a lesser extent in other commercial towns such as Kano and Kaduna (NBS, 2014).

The industrial sector of an economy is frequently regarded as the engine of growth and economic development, owing to its critical role in broadening the productive base of the economy, increasing revenue earning capacity, reducing unemployment and poverty growth, and halting rural-to-urban migration (Okoye, Nwakoby, & Okorie, 2016). According to the Central Bank of Nigeria

(2012), the industrial sector consists of crude petroleum and natural gas; Solid minerals (including coal mining, metal ores, quarrying, and other mining activities) and manufacturing (including oil refining, cement production, food beverages, and tobacco; Textiles, apparel, and footwear; Wood and wood products; Paper, paper, and publishing; Non- Metallic Products; domestic/industrial plastic and rubber electrical and electronics bas ; basic metal, iron and steel; motor vehicle and miscellaneous assembly. The manufacturing sector has shown strong growth in recent years. Nonetheless, the sector faces ongoing challenges, including declining profitability rate, constant retrenchment of employees and total winding up of some and dwindling productivity rate which is caused by high cost of production, high exchange rate and inadequate government investments in infrastructure. It has also been argued that the persistent poor performance of Nigeria's manufacturing sector is primarily due to massive imports of finished goods, high exchange rates, the gradual exit of foreign investors, and other factors that have resulted in a reduction in capital utilization and output of the economy's manufacturing sector.

Empirical studies on this topic shows that manufacturing sector performance can induces development as observed by (Ogundipe, 2022; Okon & Osesie ,2017; Umaru & Zubairu, 2012), while others showed that manufacturing sector performance has insignificant effect on economic development (Adofu, Taiga, & Tijani , 2015; Simbo, Iwuji, & Bagshaw, 2012; Afolabi & Laseinde, 2019). This implies that the relationship between these two economic variables is far from being empirically settled. As a result, research in these areas appears to be inconclusive. The different empirical study results do not allow the researchers to reach an unambiguous conclusion on the subject. matter thus the need to re-examine the effect of manufacturing sector performance on Nigeria economic development.

LITERATURE REVIEW

Manufacturing industries are important economic variables because they encourage the conversion of raw materials into finished goods. According to Charles (2012), manufacturing industries create jobs, which helps to boost agriculture and diversify the economy, allowing the country to increase its foreign exchange earnings. According to Simon-Oke and Awoyemi (2010), successive Nigerian governments have continued to articulate policy measures and programs to achieve industrial growth and development. This will not be possible until manufacturing capacity is fully utilized. Fabayo (1982) defined capacity under-utilization as a phenomenon that occurs when an industry is unable to fully utilize its installed scale of plant on a sustained basis for one reason or another. Manufacturing capacity utilization peaked at 78.70 percent in the late 1970s and plummeted to 43.80 percent in the 1980s. It fluctuated between 34.60 and 52.78 percent between 2000 and 2005. Manufacturing value added and employment generation, both of which were determinants of industrial development, fluctuated during the same time period. These were attributed to insufficient infrastructure and insufficient incentives put in place to boost manufacturing productivity in Nigeria. Ayodele and Falokun (2003) even noted that the implementation of the Structural Adjustment Programme (SAP) exacerbated the problem, as evidenced by a regime of high inflation, rendering domestic manufacturers and markets uncompetitive.

Manufacturing Production Index (MPI)

The manufacturing production Index (MPI) is an index of the prevailing direction of

economic trends in the manufacturing sectors. Manufacturing production index is release by the Central Bank of Nigeria in her quarter, half year and annual economic report which track the amount of manufacturing activity that occurred in the year. It is an index designed to measure changes in the level of output in the manufacturing sector of the economy. The index is grouped by both products (consumer goods, business equipment, intermediate goods, and materials) and manufacturing (sugar/confectionery, soft drinks, beer and stout, cotton/ textiles, synthetic fabrics, foot wear, paints, refined petroleum, cement, roofing sheet, vehicle assembly, soaps and detergents, radio /T.V) (CBN, 2007). This indicator is measured in an index based on a reference period that expresses change in the volume of production output. The index of manufacturing production is a fixed-weight measure of the physical output of the nation's factories. Manufacturing production can be accurately predicted using total manufacturing hours worked from the employment report. The Index of manufacturing production is an index for Nigeria which details out the growth of various sub-sectors in manufacturing. Manufacturing production index is a composite indicator that measures the short-term changes in the volume of production of a basket of manufacturing products during a given period with respect to that in a chosen base period. The National Bureau of Statistics compiles and publishes it quarterly, semi-annually, and annually (NBS, 2017).

The level of the Manufacturing Production Index is an abstract number whose magnitude represents the status of manufacturing production in a given period of time as compared to a reference period of time. Because the base year was once set at 1990, that year was assigned an index level of 100. The most recent base year is 1990. This data is considered a very important and trusted economic measure. If the index has a value below 50, due to a decrease in activity, it tends to indicate an economic recession, especially if the trend continues over several months. A value substantially above 50 likely indicates a time of economic growth. The values for the index can be between 0 and 100. Manufacturing production is reported under industrial production index which comprises of manufacturing, mining and electricity.

Investors can also use the MPI to their advantage because it is a leading indicator of economic conditions. The direction of the trend in the MPI tends to precede changes in the trend in major estimates of economic activity and output, such as the GDP, Industrial Production, and Employment.

Manufacturing sector contribution to Gross Domestic Product (GDP) in Nigeria

The value of final goods and services produced in the economy during a given period is referred to as GDP (Blanchard, 2013). Since its independence in 1960, Nigeria's economy has remained weak, narrow, and externally oriented, with agriculture and mining and quarrying (including crude oil and gas) accounting for approximately 65% of GDP and more than 80% of government revenues. Furthermore, primary production activities generate more than 90% of foreign exchange earnings and 75% of employment. Secondary activities, such as manufacturing and building and construction, on the other hand, have traditionally had a higher potential for job creation, broadening the productive base of the economy, and generating sustainable foreign exchange earnings and government revenues, accounting for only 4.14 and 2.0% of gross output, respectively (Ikenna & Olugbenga, 2016).

The manufacturing sector in Nigeria was characterized by rising production costs due

to high tariffs, rising energy input costs, reliance on poor and inadequate public sector infrastructure, and rising import costs. Nigeria is not immune, and the sharp depreciation of the naira has harmed the country (Akinmulegun & Oluwole, 2014). Because of the abundant labor force and the agrarian nature of the economy, the manufacturing sector in Nigeria could be assumed to have a vast potential for economic development. However, the absorptive capacity for labor expected from agriculture, as well as other spillover effects, were quickly revealed to be a mystery. Import substitution, industrialization, and other incentives to attract foreign entrepreneurs all failed eventually, leaving a weak and infant manufacturing sector. This paved the way for export promotion industrialization, especially in the early 1970s, when Nigeria reaped windfall profits from crude oil sales. Furthermore, the capital intensiveness of the manufacturing sector as a result of technological advancement cannot be overstated. As a result, manufacturing in Nigeria is linked to foreign exchange earnings for capital equipment purchases (Akinmulegun & Oluwole, 2014).

Average Manufacturing Capacity Utilization

According to the Nigeria Bureau of Statistics (NBS,2020), the average utilization of manufacturing capacity in Nigeria for the fourth quarter of 2020 was 56.3%. This is based on data gathered from the NBS's Annual Survey of Manufacturing Industries. The NBS defines manufacturing capacity utilization as ,, the ratio of actual output to the maximum possible output that the installed productive capacity could produce. " In other words, it assesses how much of a factory's potential output is realized.

It should be noted that manufacturing capacity utilization in Nigeria has been relatively low in recent years, with an average of 57.8% in 2019. According to the report, despite the manufacturing sector's significant role in the country's economic diversification and industrialization, Nigeria's manufacturing capacity utilization has remained low. A number of factors contribute to Nigeria's low manufacturing capacity utilization, including inadequate infrastructure, high energy costs, limited access to finance, low entrepreneurship and innovation, insufficient linkage between research and industry, and weak institutions.

Furthermore, the COVID-19 pandemic has exacerbated the situation, resulting in a decline in manufacturing activities while the sector grows. The pandemic has highlighted the vulnerabilities and challenges confronting Nigeria's manufacturing industry, as well as the need for policy interventions to promote growth and sustainability. The Nigerian government, on the other hand, has recently launched a number of initiatives aimed at boosting the manufacturing sector, including the establishment of special economic zones and the implementation of tax breaks for manufacturing firms. As a result, there is optimism that Nigeria's manufacturing capacity utilization will improve in the coming years.

Foreign Direct Investment

Foreign trade is critical in estimating the economic and social characteristics of countries around the world. Domestic production and consumption activities, in conjunction with foreign transactions of goods and services, have been the foundation of an economy's operation in terms of growth rate and per capita income (Afaha & Njogo, 2012).

Foreign direct investment (FDI) is a direct investment in a country's production or business by an individual or company from another country, either through the purchase of a company in the target country or the expansion of operations of an existing business in that country. Foreign direct investment differs from portfolio investment, which is a passive investment in foreign securities such as stocks and bonds. The World Bank (1996) defined Foreign Direct Investment (FDI) as an investment made to acquire a long-term management interest (usually 10% of voting stock) in an enterprise operating in a country other than the investors' own. Foreign direct investment refers to direct equity flows into an economy. It is the sum of equity capital, earnings reinvestment, and other capital. Direct investment is a type of cross-border investment in which a resident of one economy has control or a significant degree of influence over the management of a resident of another economy. The presence of a direct investment relationship is determined by ownership of 10% or more of the ordinary shares of voting stock.

According to Obida and Abu (2010), Foreign Direct Investment (FDI) not only provides developing countries (including Nigeria) with much-needed capital for investment, but it also improves job creation, managerial skills, and technology transfer. Such investments can be "greenfield" (also known as "mortar and brick") or merger and acquisition (M&A), which involves the acquisition of existing interest rather than new investment.

The criterion for the existence of a direct investment relationship in corporate governance is ownership of at least 10% of the ordinary shares or voting stock. Portfolio investment is defined as ownership of less than 10%. FDI includes not only mergers and acquisitions and new investment, but also reinvested earnings and loans, as well as other forms of capital transfer between parent companies and their affiliates. Countries may host FDI projects in their own country as well as participate in investment projects in other countries. The inward FDI position of a country is made up of hosted FDI projects, whereas outward FDI is made up of investment projects owned abroad (Adeolu, 2007).

Foreign direct investment (FDI) refers to investment by multinational corporations (MNCs) with headquarters in developed countries. This investment entails not only a transfer of funds, but also a comprehensive package of physical, manufacturing techniques, managerial and marketing expertise, products, advertising, and business practices aimed at increasing global profits. FDI includes not only mergers and acquisitions and new investment, but also reinvested earnings, loans, and other forms of capital transfer between parent companies and their subsidiaries (Akanegbu & Chizea, 2017). Foreign Direct Investment (FDI) is frequently regarded as an important catalyst for economic growth in developing countries because it influences economic growth by stimulating domestic investment, increasing capital formation, and facilitating technology transfer in host countries (Falki, 2009).

Human Development Index

The HDI measures a country's progress in three areas of human development: income, education, and health. Nigeria ranks 161 out of 189 countries in the HDI, with a score of 0.534, indicating a low level of human development, according to the Human Development Report 2020. In terms of income, Nigeria's GNP per capita in 2019 was $2,229, which is relatively low when compared to other countries. This is due to the country's reliance on the oil industry, which has been harmed by fluctuations in global oil

prices as well as disruptions caused by conflicts in the Niger Delta region.

The report stated that while Nigeria has made progress in increasing access to education, the quality of education remains a challenge. In 2018, the adult literacy rate in Nigeria was 62.0%, and the average number of years of schooling for children is only 9.9 years. According to the report, Nigeria has made progress in lowering child mortality rates and improving maternal health. However, with a high burden of infectious diseases such as malaria and tuberculosis, the country still faces significant challenges in terms of healthcare access and quality.

Theoretical Framework

This research is based on the endogenous growth model. The failure of Neo-classical theories to explain the sources of long-run economic growth motivated the development of the endogenous growth model. The Neo-classical theory does not explain the inherent characteristics of economies that cause them to grow over time. The dynamic process by which capital-labor ratios approach long-run equilibrium is the focus of Neo-classical theory. All economies will converge to Zero growth in the absence of external technological change, which is not clearly explained in the neoclassical model.

Neoclassical Theory

Rising GDP, according to Neo-classical theory, is a temporary phenomenon caused by technological change or a short-term equilibrating process in which an economy approaches its long-run equilibrium. The majority of economic growth, according to neoclassical theory, is attributed to a completely independent process of technological progress. According to neo-classical theory, developing countries' low capital-labor ratios promise exceptionally high rates of return on investment. Based on this premise, it was expected that the World Bank and the International Monetary Fund's free market reforms imposed on highly indebted countries would result in increased investment, rising productivity and higher living standards.

Despite prescribed trade and domestic market liberalization, many LDCs experienced little or no growth and were unable to attract new foreign investment or stem domestic capital flight. The anomalous behavior of developing-world capital flows (from poor to rich countries) aided in the development of the concept of endogenous growth, or, to put it another way, the new growth theory. The emerging development theory includes the new growth theory.

Endogenous Growth Model

The new growth theory provides a theoretical framework for analyzing endogenous growth, or persistent GNP growth determined by the system governing the production process rather than external forces. Unlike traditional neoclassical theory, these models believe that GNP growth is a natural consequence of long-run equilibrium. The primary motivations for the new growth theory are to explain both growth rate differences across countries and a larger proportion of observed growth. Endogenous growth theorists, in particular, seek to explain the factors that determine the rate of GDP growth that is left unexplained and exogenously determined in the Solow neoclassical growth equation (i.e., the Solow residual). Endogenous growth models share some structural similarities with their neoclassical counterparts, but their underlying assumptions and conclusions differ significantly. The most significant theoretical differences result from rejecting the neoclassical assumption of diminishing marginal returns to capital investments, allowing for higher returns to scale in

aggregate production, and frequently focusing on the role of externalities in determining the rate of return on capital investments. Endogenous growth theory seeks to explain the existence of increasing returns to scale and the divergent long-term growth patterns among countries by assuming that public and private investments in human capital generate external economies and productivity improvements that offset the natural tendency for diminishing returns. And, while technology remains important in these models, it is no longer required to explain long-term growth. A useful way to contrast new (endogenous) growth theory with traditional neoclassical theory is to recognize that many endogenous growth theories, such as the Harrod-Domar model, can be expressed by the simple equation Y = AK. In this formulation, A represents any factor that influences technology, and K includes both physical and human capital. And because there are no diminishing returns to capital in this formula, there is a chance that investments in physical and human capital will generate external economies and productivity gains that outweigh private gains by a large enough margin to offset diminishing returns. The net result is sustained long-term growth, which traditional neoclassical growth theory forbids.

Empirical Review

Afolabi and Laseinde (2019) investigated the impact of manufacturing sector output on economic growth in Nigeria from 1981 to 2016. The study used secondary data from the Central Bank of Nigeria statistical bulletin for the Autoregressive Distributed Lag (ARDL) model and the Granger causality techniques on RGDP, manufacturing capacity utilization (MCU), manufacturing output (LMO), government investment expenditure (GINVEXP), money supply (LM2), and interest rate (INR). The variables' long-run and short-run relationships were established. The findings revealed that MCU has a positive impact on RGDP, while LMO also has a positive impact on RGDP. It was also discovered that GINVEXP has a negative impact on RGDP, whereas LM2 has a positive impact on RGDP. Furthermore, the findings revealed unidirectional causality between RGDP and MCU, LMO, and LM2.

Adofu, Taiga, and Tijani (2015) used the ordinary least square method to investigate the empirical relationship between the Manufacturing sector and Economic Growth in Nigeria from 1990 to 2013. The findings show that the manufacturing sector's output contributed negatively and had an insignificant relationship to real GDP growth, indicating that the Nigerian economy's manufacturing sector is currently decaying as a result of the failure to implement policies aimed at boosting the sector. The average manufacturing capacity utilization rate contributed positively and had a significant relationship to real gross domestic product growth; the exchange rate and interest rate did not contribute to real gross domestic product growth, which shows a sign of macroeconomic instability; the inflation rate contributed positively to real gross domestic product growth but, the insignificant nature of the inflation rate was indicative of the fact that the inflation in the Nigerian economy is not properly managed; government expenditure was significant indicating that the expenditure made by the government in the Nigerian economy was adequate but not properly managed, but nevertheless, contributed positively to economic growth.

Ogundipe (2022) examined the effects of Nigeria's manufacturing sector on economic growth from 1981 to 2018. The study employs the OLS regression methodology to

investigate the relationship between the specified explanatory factors and the growth of the Nigerian economy. The findings show that the output of the manufacturing sector has a positive and significant relationship with the increase of the gross domestic product, indicating that it has a positive impact on that growth. The significance of this variable suggests that Nigeria's manufacturing industry is currently one of the country's main economic drivers. Furthermore, capital and GDP have a strong and positive correlation, implying that capital can help drive GDP growth. The relationship between labor and GDP growth is both positive and significant, indicating that labor has a positive effect on GDP. The relationship between foreign direct investment and GDP is strong and positive, indicating that FDI has a positive impact on GDP growth. The relationship between the exchange rate and GDP is both positive and insignificant, implying that Nigeria's exchange rate management is inadequate. The fact that the Nigerian economy's manufacturing sector is currently one of its main driving forces may be responsible for the significant and positive impact of manufacturing production on economic growth.

Okon and Osesie (2017) used the ordinary least square method to examine the impact of the manufacturing sector on economic growth in Nigeria from 1981 to 2015. Based on the major findings, it was concluded that there is a significant positive relationship between manufacturing output and economic growth in Nigeria. However, according to the mean score result, the most serious hazards encountered in the manufacturing sector are physical hazards, chemical hazards, and psychosocial hazards. As a result, it is appropriate to suggest that employers improve the dissemination of safety information to workers in order to remind them of the importance of safety measures in achieving a safe workplace.

Ikenna and Olugbenga (2016) used the Ordinary Least Square (OLS) technique with time series data from 1991 to 2010 to examine the contribution of Nigeria's manufacturing sector to GDP growth. The findings show that aggregate GDP increased during the study period, with an average GDP growth rate of 4.98%. Using OLS regression with poor relationships, severe multicolinearity was discovered in the GDP time series data.

Simbo, Iwuji, and Bagshaw (2012) investigated the performance of Nigeria's manufacturing sector from independence to 2012, using performance indices such as percentage contribution to GDP, index of manufactured product, percentage growth rate, manufacturing value added, employment growth rate, and percentage of capacity utilization. Despite many policies and developmental initiatives implemented by successive civilian and military administrations since independence, the Nigerian manufacturing sector has grossly under performed in comparison to its potentials: a 52-year analysis of growth and retrogression (1960-2012).

Olorunfemi, Obamayi, Adekunjo, and Ogunleye (2013) investigated Nigeria's manufacturing performance: implications for sustainable development. The study found a positive relationship between manufacturing performance and each investment, exchange rate, and export using panel data analysis.

Simon-Oke and Awoyemi (2010) examined manufacturing capacity utilization and industrial development in Nigeria: as assessment 1976-2005. Manufacturing capacity utilization, value added and

employment generation variables were regressed on index of industrial productivity using co-integration and error correction mechanism analytical tools. The study revealed presence of long run positive relationship between manufacturing capacity utilization, value added and index of industrial production.

Olowu, Ropheka and Iyakwari (2023) examined the role of manufacturing sector in gearing economic growth in Nigeria from 1986-2014. Time series experimental research was adopted. Unit root test was carried out to test the stationarity levels of the variables before conducting the regression analysis to avoid spurious regression results. The co-integration results showed that long-run equilibrium relationship exist among the variables used for the analysis at 5% level of significance. The findings revealed that variations in demand are a significant driving force for variations in capacity utilization. The findings further showed that a percentage change in manufacturing output on average increases GDP by 0.04%.

Corrado and Mattay (1997) researched on how manufacturing capacity utilization impacts on real growth, inflation, and short run costs. In their report on the United States Industrial Sector, they showed how capacity utilization can impact on economic growth using the non- parametric tool of correlation analysis. Their empirical findings were that a correlation of 0.9 existed between annual changes in the real output of goods and the index of capacity utilization for manufacturing. More importantly, they posted that movements in capacity utilization can be taken as stemming primarily from shocks to aggregate demand, which pushes the economy along an upward-sloping aggregate supply curve. They found that capacity utilization in the manufacturing sector was indicative of the cyclical state of overall aggregate demand and for this reason the predictive power factory operating rates for inflation had long endured. Most fluctuations in aggregate output came from changes in the demand for goods and new structures. In short, capacity utilization in manufacturing was found to be indicative of the fact that the final demand for services contributed little to overall business fluctuations.

METHODOLOGY

The study used secondary data collected from Central Bank of Nigeria Statistical Bulletin from 1999 to 2021 while Auto Regressive Distributed lag models (ARDL) was used to analysis the data. The study adopted and modified the model of Ogundipe (2022) who investigated the Impact of Manufacturing Sector on Economic Growth in Nigeria.
His model is stated thus:

GDP = f (K, L, MGDP, FDI, EXR)

Where,
GDP = Gross Domestic Product; K = Gross Capital Formation; L = Labour ; MGDP = Manufacturing Output; FDI = Foreign Direct Investment; EXR = Exchange Rate;. In order to capture the peculiar nature of Nigeria economy, the model was adapted and modified to: HDI = f (AMU, MPI, RMG, FDI)

Where,
HDI= Human Development Index, AMU = Average manufacturing capacity utilization; MPI = Manufacturing Production Index; RMG = contribution of manufacturing sector to gross domestic product, FDI =Foreign direct investment.

RESULTS AND DISCUSSION

Table 1: Descriptive statistics results

Variables	Obs	Mean	Standard Dev	Min	Max	Skewness	Kurtosis
HDI	23	0.486911	0.046421	0.400000	0.540000	-0.378544	1.868776
AMU	23	52.58174	6.599292	34.60000	58.10000	-1.915772	5.262717
MPI	23	140.7504	39.42310	89.20000	190.4000	-0.143530	1.492669
RMG	23	6722.631	6566.951	891.2900	25725.87	1.470311	4.480519
FDI	23	755.4004	404.2976	92.76000	1360.310	-0.361465	1.880389

Source: Computer analysis using E-views 12.0

Table 1 shows the descriptive statistics results for the entire sample of the study. We observed that for the full sample, the mean (or standard deviation) values for Human Development Index, Average manufacturing capacity utilization; Manufacturing Production Index; contribution of manufacturing sector to gross domestic product and Foreign direct investment are 0.486911, 52.58174, 140.7504, 6722.631 and 755.4004 (or 0.046421, 6.599292, 39.42310, 6566.951 and 404.2976), respectively. The maximum and minimum values for the three variables are found to be between 25725.87and 0.400000, respectively. The skewness has both negative and positive values, which shows a negatively and positively skewed distribution.

The research used Augmented Dickey-Fuller (ADF) unit root text to determine the stationarity of the variables. Table 2 shows that all the variables are not stationary at level except AMU as a result of that we went further to difference the variables more. Table 3 indicates that all variables were stationary at 1st difference and this necessitated the use of Auto Regressive Distributed lag models (ARDL) as method of data analysis.

Table 2: Result of ADF Unit Root Test at Level

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Remark
HDI	-0.824339(0.7922)	-3.769597	-3.004861	Not Stationary
FDI	-1.972547(0.2957)	-3.769597	-3.004861	Not Stationary
MPI	-0.517807 (0.8698)	-3.769597	-3.004861	Not Stationary
AMU	-3.241872(0.0309) **	-3.769597	-3.004861	Stationary
RMG	-2.825967(0.0709)	-3.769597	-3.004861	Not Stationary

***Source**: Author's Computation*

Table 3: Result of ADF Unit Root Test at 1st Diff

Variables	ADF Test Statistic	Test Critical Value at 1%	Test Critical Value at 5%	Remark
HDI	-4.196275(0.0041) **	-3.788030	-3.012363	Stationary
FDI	-6.357252 (0.0000) **	-3.788030	-3.012363	Stationary
MPI	-3.344128 (0.0256) **	-3.788030	-3.012363	Stationary

AMU	-3.617841(0.0144) **	-3.788030	-3.012363	Stationary
RMG	-3.912258(0.0076) **	-3.788030	-3.012363	Stationary

***Source**: Author's Computation*

With the determination of ARDL as method of data analysis especially short run relationship there is need to determine the long run relationship using ARDL Co-Integration Relationship**.**

ARDL Co-Integration Test

The confirmation of the stationarity of the data through the unit root test of ADF allows for the determination of the co-integration relationship between the dependent and explanatory variables in the models. The ARDL was chosen as against the traditional Johansen co-integration because it is structured in such a way that it considers the different order of integration of financial time series data. The bound test follows the critical criterion at the lower bound and upper bound value for decision at the three levels of significance in 1%, 2.5%, 5%, and 10%. Given a computed F statistics Value of 4.634104 which is greater than the lower and upper critical bound values at 2.5%, 5% and 10% respectively, thus indicating the existence of a steady-state long-run relationship among the variables. This suggests that the various selected variables have a long-run relationship with economic development.

Table 4. ARDL bounds tests for cointegration

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	4.634104	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Author's Calculation employing E-Views 12 Software

Table 5 Nature of Long-Run Relationship/ARDL Error Correction Mode

Variable	Coefficient	Std. Error	t-Statistic	Prob.
FDI	3.43E-05	2.62E-05	1.308187	0.2093
AMU	-0.000336	0.001513	-0.222257	0.8269
MPI	3.08E-05	0.000417	0.073732	0.9421
RMG	0.001706	0.00982	0.174046	0.8640
CointEq(-1)*	-0.276678	0.120911	-2.288274	0.0361
R-squared	0.171081	Mean dependent var		0.003864
Adjusted R-squared	0.171081	S.D. dependent var		0.020958
S.E. of regression	0.019081	Akaike info criterion		-5.035842
Sum squared resid	0.007646	Schwarz criterion		-4.986249
Log likelihood	56.39426	Hannan-Quinn criter.		-5.024160
Durbin-Watson stat	2.014556			

Source: Author's Calculation employing E-Views 12 Software

The ARDL result has proven that Human Development Index, Average manufacturing capacity utilization, Manufacturing Production Index, contribution of

manufacturing sector to gross domestic product and Foreign direct investment are co-integrated/related in the long run. Consequently, the determination of the nature of the long-run relationship becomes necessary as well as the speed of the adjustment to equilibrium. The result in Table 5 shows that FDI,MPI and RMG has a positive and insignificant relationship with HDI while AMU has positive and insignificant relationship with HDI. In terms of the speed of adjustment, Table 5 reveals that the model moves toward equilibrium following disequilibrium in the explanatory variables. The ECM is negatively signed with a coefficient of -0.276678, a suggestion that -27.6678% of error generated in the previous period is corrected in the current period and is statically significant.

Diagnostic Test

Table 6 Test for heteroskedasticity and serial correlation LM test

	F-statistics	Probability
Serial Correlation LM Test:	2.223067	0.1451
Heteroskedasticity Test	1.468323	0.2545

***Source**: Author's Calculation employing E-Views 12 Software*

Test for heteroskedasticity and serial correlation LM test In line with the classical linear regression assumption, the model was subjected to diagnostic analysis of serial correlation LM test and heteroskedasticity test. The p-values of 0.1451 and 0.2545 for serial correlation LM test and heteroskedasticity test are insignificant at a 5% level of significance. This implies that the model has no serial correlation LM test and heteroskedasticity test problem.

CUSUM Tests of Stability

The stability test results are revealed in Fig. 1. The CUSUM test is the test used to check stability within the model. The findings from the stability test confirm the evidence that the model is stable. This is indicated by a movement of blue lines located within the critical lines (two-red dotted lines) in the figures. Therefore, at significant level of 5%, the CUSUM stability tests confirm the good performance of the model which can be concluded to mean that both the short-run and long-run coefficients in the ARDL model are stable.

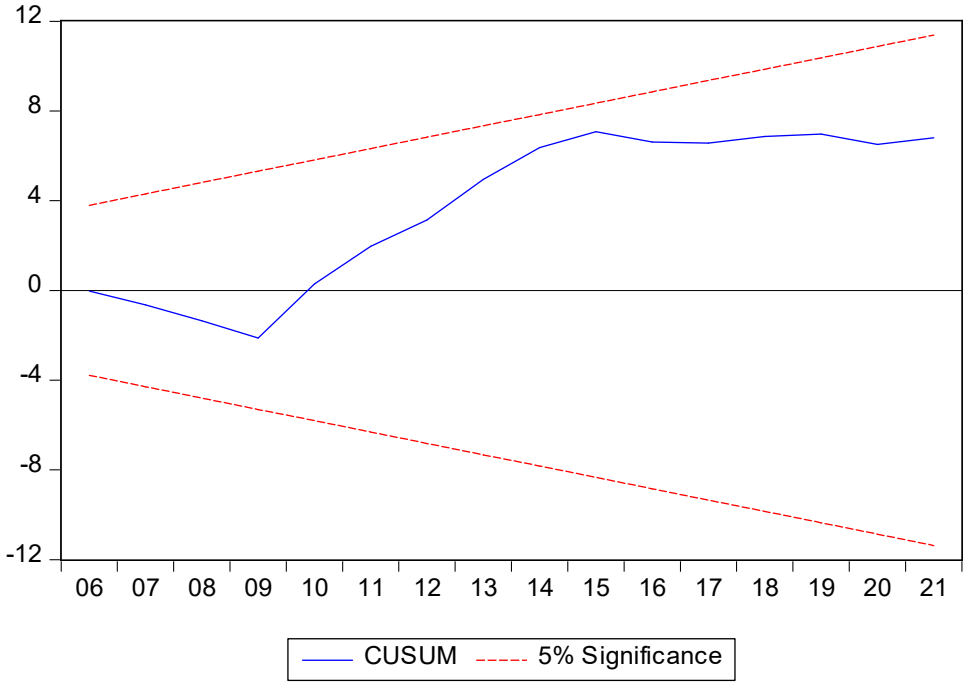


Fig. 1. CUSUM text, Source: E-views 12.0 version data output

Short Run OLS Relationship

In analyzing the short-run nexus between manufacturing sector and Nigeria economic development, the OLS regression was applied and the result shown in Tables 9. The outputs were interpreted using the coefficients of the individual variables, Adjusted R-square, F-statistic, and Durbin Watson.

Table 7. OLS regression: Manufacturing Sector and FDI

Dependent Variable: HDI
Method: ARDL

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
HDI(-1)	0.723322	0.292789	2.470451	0.0251
FDI	3.43E-05	2.62E-05	1.308187	0.2093
AMU	-0.000336	0.001513	-0.222257	0.8269
MPI	3.08E-05	0.000417	0.073732	0.9421
RMG	0.001706	0.009802	0.174046	0.8640
C	0.109381	0.192570	0.568006	0.5779
R-squared	0.835015	Mean dependent var		0.488361
Adjusted R-squared	0.783457	S.D. dependent var		0.046977
S.E. of regression	0.021860	Akaike info criterion		-4.581297
Sum squared resid	0.007646	Schwarz criterion		-4.283740
Log likelihood	56.39426	Hannan-Quinn criter.		-4.511201
F-statistic	16.19566	Durbin-Watson stat		2.014556
Prob(F-statistic)	0.000009			

Source: *Author's Calculation employing E-Views 12 Software*

Table 7 shows that FDI, MPI and RMG have positive but insignificant effect on human development index of Nigeria while AMU has negative and insignificant effect on HDI. The constant parameter for the model is insignificant but positively related to human development index. It has a positive coefficient of 0.109381 implies that if all explanatory variables are held constant in the short-run, human development index will increase by 0.109381. Meanwhile, the coefficient of multiple determinants (R^2) showed a coefficient of 0.835015≈ 0.83 which implies a 83% explanation of the behavior of human development index by the totality of the explanatory variables: Average manufacturing capacity utilization (AMU); Manufacturing Production Index (MPI); Contribution of manufacturing sector to gross domestic product (RMG), Foreign direct investment (FDI) on the short-run. The Adjusted R^2 further proves this with the adjusted value of 0.783457≈ 0.78 which implies that 78 percent explanation of the behaviour of HDI by the totality of the explanatory variables with the remaining 22 percent behaviour attributed to other variables outside the model otherwise referred to as the stochastic variables. The F-statistic indicates that the model is well fit for the estimation because Fstat for the model is 16.19566 is greater than the F-critical value at a 95 percent significance level. Also, the Prob(F-statistic) of 0.000009 indicates that Average manufacturing capacity utilization (AMU); Manufacturing Production Index (MPI); Contribution of manufacturing sector to gross domestic product (RMG), Foreign direct investment (FDI) significantly influenced variations on human development index within the period of the study. However, the Durbin Watson Statistic value of 2.014556 is symptomatic of autocorrelation. As a result, the serial correlation test in Table 6 shows that there is no autocorrelation problem in the model and could be used for statistical inference like hypothesis testing and forecasting.

Table 8 Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
AMU does not Granger Cause HDI	21	3.86696	0.0427
HDI does not Granger Cause AMU		0.01849	0.9817
FDI does not Granger Cause HDI	21	3.87313	0.0425
HDI does not Granger Cause FDI		0.47455	0.6306
MPI does not Granger Cause HDI	21	0.68181	0.5198
HDI does not Granger Cause MPI		9.27776	0.0021
RMG does not Granger Cause HDI	21	1.76656	0.2027
HDI does not Granger Cause RMG		4.21659	0.0338

***Source**: Output Data from E-views 12.0*

Table 8 indicates a unilateral causality between AMU, FDI, MPI and RMG on HDI. The probability value of less than 5% significance level indicates a unidirectional causality between manufacturing sector and human development index of Nigeria within the period of the study. The result shows that manufacturing sectors granger causes economic development meaning that manufacturing sectors will help in improving the income ,health and education of Nigerians if allowed to grow or function properly by lowering the tax burden and providing infrastructure.

CONCLUSION AND POLICY IMPLICATION

The syndrome of JAPA (situation where every young Nigerian wants to leave the country for a better living) and the need to improve the living conditions of Nigerians by creating more jobs and improving the standard of living of our teeming or young population makes it necessary to embark on this study. As such the objective of the study is to investigate the effect of manufacturing sectors (Average manufacturing capacity utilization (AMU); Manufacturing Production Index (MPI); Contribution of manufacturing sector to gross domestic product (RMG), Foreign direct investment (FDI)) on the economic development (human development index) of Nigeria from 1999 to 2021. To achieve the objectives of the study Auto Regressive Distributed lag models (ARDL) was used as method of data analysis after testing for the unit root text. The result of the analysis indicates that Manufacturing sectors has an insignificant effect on economic development of Nigeria which is consistent with the study of Adofu et al (2019); Simbo et al (2012); Afolabi & Laseinde, (2019).The study therefore concludes that effective performance of the manufacturing sector is needed for economic development of Nigeria and that urgent effort is needed to tackle the challenges facing manufacturing sector in Nigeria as such the study makes the following recommendations; Encourage local production: Importing cheap goods from other countries is one of the major factors limiting the growth of Nigeria's manufacturing sector. Others include, To reduce the negative impact of imports on the local manufacturing industry; Infrastructure Investment; Access to Finance; Tax Incentives; Education and Training; Export promotion. By implementing these policies and promoting a conducive business environment for manufacturers, the manufacturing sector in Nigeria can contribute to the economic development of Nigeria.

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