

An analysis of the effect of manufacturing sector on the growth of the Nigerian economy

Celina Ududechinyere Ph.D1*;Eze, Onyebuchi Michael 2*And Nweke, Abraham Mbam

Department of Economics, Ebonyi State University, Abakaliki, Ebonyi State, Nigeria

Corresponding Author: Celina Ududechinyere Ph.D

Abstract: *The study investigated the influence of manufacturing sector output on economic growth in Nigeria from 1981 to 2016. Autoregressive Distributed Lag (ARDL) model and Granger causality technique were utilized. Data from the Central Bank of Nigeria, statistical bulletin on RGDP, manufacturing capacity utilization (MCU), manufacturing output (LMO), government investment expenditure (GINVEXP), money supply (LM2) and interest rate (INR) were used. Evidence of long-run and short-run relationships among the variables is established. The results showed that MCU has positive influence on RGDP while LMO affects RGDP positively. It also showed that GINVEXP has negative effect on RGDP whereas LM2 influenced RGDP positively. More so, evidence of unidirectional causality is established between RGDP and MCU, LMO and LM2. Therefore, government should intensify efforts to promote socio-economic infrastructural, macroeconomic and institutional framework in Nigeria to provide favourable environment for external and domestic institutions interactions; hence, harness mobilized funds effectively towards productive manufacturing sector.*

Keywords: *Manufacturing Sector Output, Economic Growth, Autoregressive Distributed Lag (ARDL) Model, Granger Causality*

Date of Submission: 10-04-2018

Date of acceptance: 24-04-2018

I. Introduction

Manufacturing has generally been described and accepted as an engine of growth and development of any country. In modern economies, industrialization under industrial sector is widely conceived as a critical tool for accelerating economic growth and development. It serves as a channel for the production of goods and services, creation of massive employment opportunities and generation incomes (Olorunfemi, Tomola, Felix & Ogunleye, 2013). According to Adofu, Taiga & Tijani (2015), manufacturing is viewed as the production of merchandise for sale or use through the application of tools, machine, labour, chemical and biological formulation. It involves both handicraft of human activities and high tech through which raw materials are transformed or converted into finished product in large scale.

In modern economy today, the development of industries (industrialization) is extensively based on technological development of productive strategies. This simply implies a transformation of an economy from traditional low production system into modern mass production system, which involves more efficient and automated system through sustained and deliberate combination and application management techniques, suitable technology and other resources that promote high tech production techniques (Ayodele & Falokun, 2003). It has been argued that the fastest channel by which rapid sustainable growth and development is achieved in any economy is via industrial capacity, technological innovation and enterprise development, rather than vast human resources and level of endowed material resources (Olamade, Oyebisi & Olabode, 2014). For example, most developed countries like Germany, rose to become one of the largest economy in the world today despite its poor natural resources and chronic inflation it faced from 1920s, due to its effective exploitation of the manufacturing sector. More so, Bennett, Anyanwu & Kalu (2015) postulated that industrial development deals with the application of modern equipments, machines and technology in the production of goods and services as well as to alleviate human suffering and ensure welfare improvement in a society. Hence, modern manufacturing processes involve the development of managerial and entrepreneurial skills as well as high technological innovations that often promote large scale productivity and improved living conditions.

In Nigeria, the history of manufacturing and industrial development reflect how a nation could neglect a vital sector via economic policy inconsistencies and the abandonment of the agricultural sector for oil sector, which was the major economic base of the country due to the discovery of oil in commercial quantity in 1970s (Adeola, 2005). Ogbu (2012) contested that oil industry in Nigeria is not a major determinants of employment; hence, it has limited contributions to other sectors of the economy since the capacity is yet to be developed by the government to vigorously pursue the more value-added activities of the petrochemical value

chain. Thus, the oil industry has overtime lacks technological spillover effects. For instance, the contribution of the manufacturing sector to economic growth in Nigeria before 1970s was 10%.

Adofu, Taiga &Tijani (2015) expressed that economic growth in Nigeria affected adversely due to prolonged economic recession caused by a fell in the world oil market in the early 1980s alongside the sharp decline in the foreign exchange earnings. Consequently, the economy suffered series of problems ranging from excessive dependence on import for consumption and input materials, socio-economic infrastructure decay, capacity under-utilization in the industrial sector, poor management strategies and institutional framework, and agricultural sector neglect that used to be the economic base of the Nigerian economy, etc. As a result, the economy has remained undiversified with a decreased in incomes and standard of living of the people (Adesina, 1992).

It is against the problems associated with the growth and structural change in the economy that IMF-World supported Adjustment Programme (SAP) was adopted in 1986 to tackle the economic problems in the economy;yet, the economy remained unimproved. Today, the country moved from a middle income nation in the early 1970s and 1980s to 30 poorest nations in the world (Adofu et al., 2015). Despite the numerous vast oil wealth of the country, the World Bank Development Indicators (WBDI, 2012) indicated that greater number of Nigerians suffer from abject poverty living on than \$2 per day. Similarly, Nigeria was also ranked 156 out of 179 in human development index, representing a significant decrease in human development ranking of 151 of the country in 2004 (UNHI, 2011). Consequently, the nation has been placed amongst the 47th poorest countries in the world (WBDI, 2012). However, the mono-economic practice and the underutilization of the endowed natural resources of the country were blamed for the extreme poverty observed in the economy, especially in the manufacturing sector that has the potentialities of boosting employment opportunities and economic development of the nation. Thus, to make the economy viable, there is need to urgently rebuild the deteriorated infrastructures, creates more employment opportunities, make more goods and services available for the people in the society at affordable prices, and as well promote economic growth and development of the nation. To achieve these, the government should pay more attention to increasing production inputs such as labour, land, capital and technology in order to improve productivity in the economy (Kayode&Teriba, 1977).

This is because, improving productivity is necessary to increase economic growth and standard of living of citizens. In view of this, it is important to re-evaluate the productivity of manufacturing sector in Nigeria. Adofu et al. (2015) argued that manufacturing is more dynamic compare to other sectors of the economy as transfer of productive resources to more dynamic sectors leads to increase in economic growth. However, the manufacturing sector in Nigeria is currently undergoing several difficulties such as weak technological base as a result of inadequate investment in research and lack of innovation and development in the economy. Consequently, the manufacturers heavily relied on the importation of machinery and other equipments to sustain their industrial production process due to limitation in foreign exchange. As a result, the contribution of the sector to the gross domestic product has remained infinitesimal.

For instance, the manufacturing sector contribution to the gross domestic product (GDP) was 5.4% in 1980 and rose to 10.7% in 1985. In 1990 and 1995, the share of the manufacturing sector to GDP declined to 8.1% and 6.7% respectively. By 2000 and 2013, the contribution of the manufacturing sector to GDP further declined to 6.2% and 4.23% respectively (CBN, 2013). Compare to other strong manufacturing sectors in other emerging economies where structural change had lifted millions of people out of extreme poverty. For example, manufacturing sector contributes to 20% to GDP in Brazil, 35% in Thailand, 34% in China, 30% in Malaysia and 28% in Indonesia (Ogbu, 2012). However, the economic structure of Nigeria reflects typically an underdeveloped nation with over 50% of the total GDP being accounted for by the primary sector of the economy such as agriculture while the oil and gas sector being the major driver of the economy thereby accounting for about 95% of the export earnings of the economy and 85% of the government revenue between 2011 and 2012 (Chete, Adeoti, Adeyinka&Ogundele, 2016). Similarly, statistics showed that capacity utilization of the manufacturing sector has overtime been sluggish and very low compare to other strong economies of the world. For instance, the capacity utilization of the Nigeria's manufacturing sector in 1990 was 40% and stood at 53.9% in 2008. By 2009, the manufacturing sector capacity utilization was 55.88% and further rose to 60.50% in 2015 (Chete et al., 2016). Theoretically, economic theory postulated that a rise in manufacturing activities in which manufacturing capacity utilization is the major indicator brings about improved gross domestic product of a nation. However, the trend analysis above showed that even though the manufacturing capacity utilization increases overtime, the growth rate of the contribution of the manufacturing sector to GDP remains infinitesimal compared to the growth rate of manufacturing capacity utilization in the economy. It is against this development, that this study investigates the influence of manufacturing sector output on economic growth in Nigeria.

II. Review of Related Literature

2.1 Theoretical Review

Kaldor (1966) postulated that manufacturing is the engine of growth for any nation who vies to promote growth and development in its economy. According to the author, manufacturing is subject to increasing returns, both dynamic and static whereas petty services and land based activities are subject to diminishing returns. Similarly, he argued that manufacturing sector tend to expands by drawing labour from other sectors of the economy in which diminishing returns exists. In this case, productivity automatically rises due to the fact that the average product of labour exceeds the marginal product. Hence, the more the output of the manufacturing sector grows, the more the productivity growth grows faster in the economy, which in turn serves as the key determinants of gross domestic product and standard of living of people (Pacheco-López&Thirlwall, 2013).

Thomas (2003) revealed that there is three principal themes in any manufacturing sector, which they identified to include that manufacturing evolved into solution base- high innovation; it is also committed to technology and innovation, which is the key for sustaining competitiveness and growth in the level of productivity. Similarly, manufacturing sector accelerate productivity and innovation in which the spillover effects spread to other sectors of the economy. In other words, manufacturing sector is a growth-led sector as it leads to increase in economic growth via increasing returns, which is a macroeconomic phenomenon because it resulted from increasing returns to scale.

Kaldor (1966) stated three laws, which expresses how economic growth is affected by the manufacturing sector in an economy. The author identified that a rise in the output of manufacturing sector leads to improved national output of a country; similarly, economic growth is a manufacturing-base and finally, he postulated that the developed and fastest growing economies in the world today are the industrializing nations in which the contribution of the manufacturing output to gross domestic product (GDP) is expanding rapidly. Kaldor's law as cited in Teshome (2014) also postulated that ^{increase} in the productivity of labour is based on the output of the manufacturing production. Pons-Novell & Viladecans-Marsal (1998) expressed that manufacturing output growth has positive nexus with gross domestic product (GDP) growth rate, which means that industrial sector leads to higher productivity than other productive sectors of the economy. This is because, industrial sector incorporate technology progress that promote growth in the economy as a whole.

According to neoclassical proposition of Solow (1956), the relationship between manufacturing and growth is discussed under the diminishing marginal productivity of capital, constant returns to scale, technical progress that are exogenously determined and substitutability between labour and capital. Solow argued that investment and savings are very important factors responsible for immediate growth in economy. In the long run, Solow identified progress and sophisticated technology as the key factor responsible for growth and development in an economy, even though technology was treated as exogenous to the economy. The approach of the neoclassical growth even though favours capital-labour as indexes of growth in the economy, the growth in technology considered exogenous remained unexplored (Olorunfemi et al.,2013).Banjoko, Iwuji&Bagshaw(2012) revealed that manufacturing sector had since its emergence with industrial revolution been transformative for all economies via its spillover effects to other sectors. Oyati (2010) stated that developed countries that could harness its powers attained higher profitability, prosperity significant growth in their economies. For example, the experiences of the developed countries and emerging economies of India, Singapore, China, Malaysia and North Korea showed the positive nexus between economic growth and manufacturing sector (Banjoko et al., 2012). Similarly, developing nations who are oriented agrarian and services in the past also formulated several initiatives to sustain growth and development of the manufacturing sectors.

2.1 The Classical Growth Theory

The conception of the modern economic growth can be traced to the criticisms of the Mercantilists theory of economic growthby the Scottish and physiocrats such as Adam Smith and David Ricardo alongside the foundation of the modern political economyas a discipline (Abdullahi, 2015). The physiocratspostulated that productive capacity allows for growth and that increasing of capital, which promote capacity can improve the wealth of nations. According to smith, agricultural development results to increase in commerce and construction works (Imoisi, 2013). To Smith, as agricultural surplus arises due to economic development, there will also arise the demand for manufactured goods and commercial services. This will in turn, leads to the establishment of manufacturing industries and commercial progress. Smith also argued that population growth is endogenous, which largely depended on the accessibility and capacity to raise workforce. More so, investment was also seen as endogenous factor that is stimulated by savings rate while land growth evolved by enhancement of technology of old land or invasion of new land (Imoisi, 2013). In overall, technological improvement stimulates economic growth. Smith also opined that division of labourpromotes growth. He saw international trade and machinery developments as engine of growth that leads to specialization in any economy. Accordingly, division of labour is limited by the extent of market (Brendt& Morrison, 2011). The

theory further demonstrated that savings creates investment that in turn, results to improved growth; hence, income allocation is one of the major determinants of how slow or fast a country grows.

To Ricardo, the output of a nation is distributed among profits, rent and wages respectively. The theory emphasized on the importance of accumulation of capital via agricultural development and other sources of profit rates and savings. Ricardo however, postulated that trade is a profit to a nation, because if a national can purchase good more cheaply abroad, it implies that more profitable work needed at home. The basic assumptions of the Ricardian theory that involve diminishing returns to land and the Malthusian principle of population are typically important to the understanding of the problems facing the overpopulated and developing economies like Nigeria (Abdullahi, 2015).

2.2 The Keynesian Theory of Economic Growth

The Keynesians improves the theory of John Maynard Keynes principle propounded in 1936 as it relates to the existence of unemployment equilibrium against the idea of the classical economists led say's law of market. The Say's law argued that free market economy are self-adjusting; hence, there should be no government intervention in the economy as that would hamper free market activities (Imoisi, 2013). However, the Keynesians believe that fiscal policy has more influence on economic growth and development of a nation than the monetary policy measures to make the economy more stable and prosperous. The Keynesians are often regarded as to demand-side economists. The Keynesians believed that market mechanism hampers economic growth and full employment in the economy. Thus, they advocated for government interference in the economy via the use of fiscal policy instruments such as government expenditure and taxation. Hence, they argued that when government expenditure increases with the reduction in tax levies, an economy would be pulled out of recession and vice-versa (Imoisi, 2013). Changes in levels of savings and investments are the factors responsible for modifications in economic activities and level of employment in an economy.

2.3 The Neoclassical Growth Theory

he neoclassical growth theory that focused on increased stocks of capital goods is referred to as the Solow-Swan growth Model. In that, the model indicates the relationship between labour-capital goods, investment and output ratio. Solow (1956) clarifies economic growth by taking into account technological improvement, exogenously determined. So far, scholars have focused on determining why growth rates differ in various countries and the fundamental issues involved in constructing economic development. The theory opined that efficient and effective utilization of factors of production is the most efficient way of achieving increased economic growth. Traditionally, the factors of production include physical capital, labour and natural resources. In neoclassical growth model, the theorists argued that in the long run, there is existence of diminishing returns to capital, and the growth rate of the per capita inversely related with the initial level of income per person (Barro, 1989).

The neoclassical growth model was developed by Robert Solow and Trevor Swan in 1950s. The model tries to model long run growth in an economy. It assumed that nations efficiently utilized their resources and hence, there are diminishing returns to capital and labour increases (Ayodele & Falokun, 2013). In view of this, the neoclassical economists postulated that increase in capital relative to labour leads to economic growth, as people would be more productive given more capital. Furthermore, less developed nations with less capital per person grows faster as each capital investment would yield greater return compare to the developed nations with ample capital. Again, in view of the diminishing returns to capital, all economies will eventually converge at a steady state where no new increase in capital would increase growth in the economy. The neoclassical growth theories also expressed that technological change is an exogenous factor. In Solow model, technological change is the key determinants of economic growth determined exogenously.

2.4 The Endogenous Growth Theory

This theory was postulated as a result of the unsatisfied explanation of the Solow's model about technology as a exogenous factor of economic growth. In this view, economists try to endogenize technology in 1980s by developing the endogenous growth theory, which includes a new concept of skills, human capital and knowledge that are responsible for increase in labour productivity (Olakunle, 2010). Human capital has increasing rates of returns as against the physical capital, which does not. Hence, there are constant returns to capital, and there is no steady state that will be achieved in the economy. As capital accumulates, growth does not slow down; however, growth rates depend on the kind of capital the country invested in. Romer (1987) explained that technological alteration is not a manner from heaven as its degree and trends can be directed. If this view holds, technology therefore is an endogenous to growth, instead of being regarded as an exogenous factor as postulated by Solow's model. Investments and human capital in the innovation are considered as very important in the process. The growth theory looked at knowledge as a public good (Romer, 1990). The new

growth theory differs completely to the law of diminishing returns, because the law of diminishing returns shows a reduction in output growth if inputs increases.

2.5 Structural Change Theory

Structural change theory is based on the notion that developing economies try to transform their domestic economic structures from traditional subsistence agriculture-base to modern economic oriented-base as well as to more urbanize and industrially diverse manufacturing and service economy. The theory attempts to establish a relationship between economic growth and industrialization. The theory postulated that underdevelopment result due to resources underutilization arising from institutional and structural factors, which originated from both international and domestic dualism. Thus, it advocated for structural transformations in line with the description of the Todaro & Smith (2011). To Todaro and Smith, the process of the transformation should be pursued vigorously in such a manner that the contribution of the manufacturing sector to national income exceedingly surpasses the share of the agricultural sector to the national income. According to Jhingan (2011), manufacturing sector plays very crucial role in the economic development of developing countries. This theory followed the Lewis work that argued that the underdeveloped economy comprises of two main sectors including a traditional economy, which involves over-populated rural subsistence sector with labour surplus and a highly productive modern sector in which the labour surplus is transferred to (Dauda, 2013). This model focused on labour surplus transferred from the traditional sector that leads to output growth and employment in the modern sector. Lewis postulated that when the urban wages increases by 30% or more, more workers will migrate to urban areas thereby leading to more output growth and employment via the modern sector. For development to occur; there is need to increase the contribution of the industrial sector to economic and development and decrease the share of the agricultural sector in an economy.

2.6 Theoretical Framework

This study is anchored on the endogenous growth model. The motivation for the endogenous growth model stems from the failure of the neoclassical theories to explain the sources of long run economic growth. The neoclassical theory failed to explain the intrinsic features of economies, which led an economy to grow over an extended period of time. Therefore, the neoclassical theory focuses on the dynamic process through which capital-labour ratio approaches long-run equilibrium. In the absence of technological change, all economies tend converge to zero growth. The neoclassical theory upholds increase in gross domestic product as a short run term equilibrating process in which the economy approaches its long run equilibrium. It credited the whole economic growth to an independent process of technological progress. It also views low capital-labour ratio of the developing nations to high rates of return on investment.

However, the endogenous new growth theory basically provides a theoretical framework for analyzing endogenous growth, which was argued to be determined within the system governing the production process rather than external forces. Against the traditional neoclassical theory, the models hold economic growth to be a natural consequence of long run equilibrium. The main aim of the new growth theory is to explain the both growth rate differentials across nations and the proportion of the growth observed. Thus, endogenous growth theorists tend to explain the factors responsible for the gross domestic product growth rate that are not explained but are exogenously determined in the Solow neoclassical growth model. The models of endogenous growth model have some common structural features with its neoclassical counterparts; however, they differ considerably in their underlying assumptions and conclusions drawn. The most significant theoretical differences are based on the neoclassical assumption of diminishing marginal returns to capital investments that permits increased returns to scale in aggregate production, and as well focusing on externalities in determining the rate of return on capital investments. By assuming that private and public investments in human capital leads to external economies and improvements in productivity that offset the natural tendency for diminishing returns, endogenous growth theory attempts to explain the existence of increasing returns to scale and the divergent long run growth trends among countries. Whereas technology plays an important role in these models, it is no longer necessary to explain long run growth.

1.7 Empirical Review

Simon-Oke & Awoyemi (2010) examined the influence of manufacturing capacity utilization on industrial development of Nigeria from 1976 to 2005 using cointegration test and error correction model (ECM). The results indicate evidence of long run relationship among the variables such as manufacturing capacity utilization, index of industrial productivity and value added in Nigeria. The study recommended that government should rectify infrastructural inadequacies by providing infrastructural facilities and as well encourage local sourcing of raw materials and intermediate products to increase manufacturing value added and create mass employment in Nigeria. Teshome (2014) investigated the impact of manufacturing sector on economic growth in Ethiopia for the period 1980-2009 using both descriptive and econometric methods of

analysis. The results indicate that manufacturing sector affect economic growth and productivity of Ethiopia positively and significantly. The results also showed that the manufacturing sector has positive impact on employment growth of Ethiopia within the period under study. On the average, the results revealed that one percent increase in manufacturing output will increase economic growth by 24 percent. More so, it was indicated in the estimation results that manufacturing sector has significant effect on labour productivity in the economy.

Olorunfemi et al. (2013) studied the influence of manufacturing sector performance on sustainable economic development in Nigeria for the period 1980-2008 using panel data analysis. The goals of the study were to determine to contribution of manufacturing sector on the gross domestic product in Nigeria; examine the structure of capacity utilization; investigates the influence of manufacturing performance on economic growth and analyze the trend in both manufacturing and employment in the economy. The results revealed positive relationship between manufacturing and capacity utilization and import. However, the results also showed negative relationship between manufacturing and exchange rate, investment and export. Therefore, the results imply that capacity utilization, investment and import are the key determinants of manufacturing performance in Nigeria. Akinmulegun&Oluwole (2014) assessed the contribution of manufacturing sector to economic growth in Nigeria in the era of globalization using Ordinary Least Square (OLS) approach. The variables used in the study include trade openness, manufacturing output and current account balance. The results indicated that manufacturing sector has insignificant contribution to economic growth of Nigeria. This implies that globalization has insignificant influence on economic growth through manufacturing sector of the economy.

Adofu, Taiga &Tijani (2015) examined the effect of manufacturing sector on economic growth in Nigeria from 1990 to 2013 through the application of ordinary least square (OLS) approach to determine the nexus between manufacturing including its components and economic growth in the economy. The variables employed in the investigation include real gross domestic product, average manufacturing capacity utilization rate, output of the manufacturing sector, interest rate, exchange rate, government expenditure and inflation rate. The empirical results indicated that manufacturing sector output has negative and insignificant effect on real GDP while average manufacturing capacity utilization rate had positive and significant effect on real GDP within the period under study. Furthermore, the results revealed that interest rate and exchange rate do not contribute to real GDP, which implies the existence of macroeconomic instability. Similarly, inflation rate was shown to contribute to real GDP positively and insignificantly in the Nigerian economy while government expenditure affects real GDP of the economy significantly. Similarly, Bennett, Anyanwu&Kalu (2015) studied the effect of industrial development on economic growth in Nigeria for the period 1973-2013 using ordinary least square (OLS) technique. The variables used in the study include gross domestic product, total savings, industrial output, foreign direct investment and inflation rate. The results indicated that industrial output has insignificant and positive effect on economic growth whereas savings has positive and significant effect economic growth of the economy. More so, the results revealed that inflation has negative influence on the economy while foreign direct investment indicates positive and significant effect on economic growth.

Loto (2012) investigated the determinants of output expansion in Nigeria's manufacturing industries for the period from 1980 to 2010 by employing ordinary least square (OLS) method, cointegration test and its associated error correction model (ECM). The variables used in the study include output of the manufacturing sector, real gross domestic product growth rate, gross domestic capital formation, per capita level of real GDP, capacity utilization, inflation rate and export of manufactured goods. The results showed evidence of long run relationship among the variables. The study also found that per capita GDP and real GDP have significant and positive contribution to manufacturing output expansion in Nigeria while capacity utilization has negative influence on output expansion of the manufacturing sector in the economy. Similarly, the results indicated that inflation has significant contribution to the manufacturing output expansion in the Nigerian economy. The results above imply that per capita level of real GDP, capacity utilization and inflation rate are the key determinants of manufacturing output expansion in Nigeria.

Chukwuedo&Ifere (2017) investigated the nexus between manufacturing output and economic growth in Nigeria for the period 1981-2013 using an eclectic model consisting of both the Kaldor's first law of growth and the endogenous growth model. The variables of the study include real gross domestic product, manufacturing output, contract intensive money, gross fixed capital and labour force. The study discovered that output of the manufacturing sector, capital and technology are the key determinants of economic growth in Nigeria. The results also showed that labour force and quality of institutions do not influence economic growth in the economy. John& Sarah (2015) examined the impact of macroeconomic determinants on industrial productivity in Nigeria from the period 1981 to 2013 through the application of ordinary least square (OLS) technique. The variables of macroeconomics employed in the study involve exchange rate, industrial production index, consumer price index, broad money supply, interest rate, credit to manufacturing sector, foreign direct investment and gross domestic product. The empirical results indicated that exchange rate has significant impact on the productivity index of industries in Nigeria. More so, the results showed that foreign direct investment,

interest rate and gross domestic product have positive influence on industrial production index in the economy. However, the study discovered that broad money supply, consumer price index and credit to manufacturing sector have negative effects on the industrial development of Nigeria within the period under study.

Emilia (2016) investigated the role of industries, especially the manufacturing sector in the national economy and its impact on sustainable development and employment creation in Romanian economy. The results revealed that Romania had entered into deindustrialization process for the past two decades. By 2000, the deindustrialization process intensity declined thereby paving way for the manufacturing sector to remain the backbone of the Romanian industry and the entire economy. However, the results also discovered that the major challenge of the Romanian manufacturing sector is the low level of labour productivity as well as medium and high technology manufacturing activities in the economy. Modebe & Ezeaku (2016) examined the linkage between inflation and manufacturing sector growth in Nigeria for the period 1982-2014 through the application of Johansen cointegration test, vector error correction model (VECM) and Granger causality approach. The variables used in the study were annual growth rate for manufacturing value added, exchange rate, inflation rate and interest rate. The results showed evidence of long run relationship among the variables. The results also revealed that interest rate and inflation rate have negative and insignificant influence on manufacturing sector growth whereas exchange rate had significant and positive impact on the growth of manufacturing sector value added in the economy. The results of the Granger causality test showed that unidirectional relationship exists between exchange rate and output growth with causality running from exchange rate to output growth. However, interest rate and inflation rate do not have significant causality with output growth in the Nigerian economy.

Emmanuel & Saliu (2017) investigated the impact of manufacturing sector on economic growth in Nigeria for the period 1981- 2015 by employing ordinary least square (OLS) technique. The study utilized the following variables such as gross domestic product as the dependent variable while the independent variables include manufacturing output, government expenditure, investment rate and money supply in the investigation of the impact of manufacturing sector on the Nigerian economic growth. The results showed that manufacturing output has positive effect on the growth of the Nigeria's economy. The results however, revealed that the major hazards facing the manufacturing sector in Nigeria include chemical hazards, physical hazard and psychosocial hazard. Sola, Obamuyi, Adekunjo & Ogunleye (2013) investigated the performance of manufacturing sector to sustainable growth and development of Nigeria with the major goals being to determine the trends in both the employment and manufacturing sector as well as the structure of industrial capacity utilization in Nigeria through the application of panel data analysis for the period 1980-2008. The results discovered that capacity utilization has positive impact on manufacturing sector in Nigeria. Similarly, results however, revealed that exchange rate, export and investment have negative influence on manufacturing sector in the economy.

Adenikinju & Alaba (2010) evaluated the performance of manufacturing sector in Nigeria with respect to the manufacturing sector's performance, productivity and energy consumption. The study utilized an aggregate model to measure changes in the total factor productivity relative to the change in energy consumption. The study found that manufacturing sector has strong correlation with energy price and supply in the economy. Thus, energy resources were indicated to play an important role in the manufacturing sector in Nigeria. It was revealed in the study that technology is actually the key determinant of manufacturing sector performance; hence, the adoption of more advanced energy efficient technological techniques and devices.

2.3 Gap in Literature

The study empirically, is an improvement on other empirical studies carried out on the influence of manufacturing sector performance on economic growth and other related topics across the globe. Various studies were reviewed, primarily to lay more credence to this research. Thus, of all the studies reviewed, research on the influence of manufacturing sector output on economic growth in Nigeria is very scanty. In the modeling, most of the studies attempt to ignore manufacturing capacity utilization, which appears to be one of the major indicators of manufacturing sector performance in any economy. Secondly, in all the studies reviewed in Nigeria, most of the studies were carried out using ordinary least square (OLS) approach and trend analysis without being mindful of the stationarity status of the variables employed in the study. Such studies include Akinmulegun & Oluwole (2014), Adofu, Taiga & Tijani (2015), Bennett, Anyanwu & Kalu (2015), Loto (2012), John & Sarah (2015), Emmanuel & Saliu (2017), Sola, Obamuyi, Adekunjo & Ogunleye (2013), Adenikinju & Alaba (2010), among others with very few applying other econometrics method of analysis. In this study, manufacturing capacity utilization and manufacturing sector output are considered as important variables. Similarly, Auto Regressive Distributed Lag (ARDL) and causality techniques are applied to examine the influence and direction of causality between the two variables in Nigeria. Hence, it is against this established gap and the desire to contribute to knowledge in literature that this study is motivated.

III. Research Methodology

To examine the influence of manufacturing sector output on economic growth in Nigeria from 1981 to 2016, stationarity test via the application of Augmented Dickey-Fuller (ADF) unit root test, Auto Regressive Distributed Lag (ARDL) model and Pairwise Granger causality technique were utilized in the analysis. The unit root test is carried out to determine the order of integration among the variables of the study. The ARDL bound model is used to investigate the short run and long run coefficients of the variables. The Pairwise Granger causality on the other hand is utilized to investigate causality between manufacturing sector output and Nigeria's economic growth. The variables used in the research include real gross domestic product (RGDP), manufacturing capacity utilization (MCU), manufacturing output (MO), government investment expenditure (GINVEXP), broad money supply (M2) and interest rate (INR). Data for the variables are sourced from the Central Bank of Nigeria (CBN) statistical bulletin and National Bureau of Statistics (NBS) of various publications ranging from 1981 to 2016.

3.1 Model Specification

The model is specified in functional form as:

$$RGDP = f(MCU, MO, GINVEXP, M2, INR) \quad 1$$

Where;

- RGDP = Real Gross Domestic Product
- MCU = Manufacturing Capacity Utilization
- MO = Manufacturing output
- GINVEXP = Government Investment Expenditure
- M2 = Broad Money Supply
- INR = Interest Rate

In linear function, the model is specified as:

$$RGDP_t = \lambda_0 + \lambda_1 MCU_t + \lambda_2 MO_t + \lambda_3 GINVEXP_t + \lambda_4 M2_t + \lambda_5 EXCR_t + \lambda_6 INR_t + e_t \quad 2$$

Where;

RGDP is the dependent variable whereas MCU, GINVEXP, M2, INR and INFR are the independent variables; λ_0 is the constant term, λ_i is are the parameters of the regression equations and e_t is the error term.

In log function, the model is expressed as:

$$LRGDP_t = \lambda_0 + \lambda_1 MCU_t + \lambda_2 LMO_t + \lambda_3 LGINVEXP_t + \lambda_4 LM2_t + \lambda_5 INR_t + e_t \quad 3$$

Where; L is the log function of the variables under study; λ_i is are parameters of the variables

3.2 A Priori Expectation

Theoretically, the study expect manufacturing capacity utilization, manufacturing output, government investment expenditure, broad money supply to have positive relationship with real gross domestic product while interest rate is expected to have negative relationship with the real gross domestic product (RGDP) in Nigeria.

IV. Empirical Results and discussion

This section of the research shows estimation results and consequently, discusses the results based on the study's objectives.

4.1 Stationarity Test

This test is conducted to determine the order of integration of the variables employed in the study using the Augmented Dickey-Fuller (ADF) stationarity test with or without trend and intercept. The table 1 below is the results of the ADF stationarity test.

Table 1: ADF Stationarity Test between RGDP and its determinants Trend and Intercept

Variables	Level		First Difference			
	ADF Statistic	5% Critical Value	ADF Statistic	5% Critical Value	Order	Remarks
LRGDP	-1.677166	-2.948404	-3.229346	-2.951125	I(1)	Stationary
MCU	-2.251816	-2.948404	-3.375960	-2.951125	I(1)	Stationary
LMO	-0.782205	-2.948404	-5.124809	-2.951125	I(1)	Stationary
LGINVEXP	-1.273919	-2.948404	-5.834537	-2.951125	I(1)	Stationary
LM2	-0.276132	-2.948404	-3.297344	-2.951125	I(1)	Stationary
INR	-3.023070	-2.948404	-8.065277	-2.951125	I(0)	Stationary

Source: Researcher's compilation from E-view 9

Table 1 above depicts ADF unit root test results between real gross domestic product and its determinants at both level and first differencing. The estimation results indicated that all the variables including

LRGDP, MCU, LMO, LGINVEXP and LM2 except INR at 5% critical value were non-stationary at level. The results however, showed that at first differencing, all the variables became stationary. The evidence of this claim is indicated by the ADF statistic and its critical values. Having achieved the same order of integration among the series, it means that the variables have long run properties. This implies that their mean, variance and covariance are constant in the long run. Therefore, the variables do not contain unit root at this level; hence, they can be used in the investigation of the study.

4.2 Auto Regressive Distributed Lag (ARDL) Bounds Cointegration Tests

Auto Regressive Distributed Lag (ARDL) bounds analysis is the estimation procedure that involves test of short run dynamics and long run relationship interactions among the variables of the study. ARDL model was developed by Pesaran & Shin (1999), primarily to examine the short run and long run coefficients of the underlying variables. ARDL model does not need all variables to be integrated of the same order before it can be utilized in an investigation. The model can be used even when the variables are fractionally integrated or with combined integrated of order one and order zero. The model is relatively more efficient even when the data size is very finite small. Harris & Sollis (2003) argued that the method ensures unbiased estimation results of the long run model. ARDL model is illustrated as:

$$\Delta y_t = \beta_0 + \sum \beta_i \Delta y_{t-i} + \sum \gamma_j \Delta x_{1t-j} + \sum \delta_k \Delta x_{2t-k} + \theta_0 y_{t-1} + \theta_1 x_{1t-1} + \theta_2 x_{2t-1} + e_t$$

Meanwhile, results ARDL are shown below. 4

Table 2: ARDL Bounds Cointegration Test between RGDP and its determinants
Dependent Variable: LRGDP

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LRGDP(-1)	0.669223	0.059200	11.30442	0.0000
MCU	0.001030	0.000759	1.357166	0.1856
LMO	0.351626	0.074453	4.722811	0.0001
LGINVEXP	-0.034602	0.013945	-2.481335	0.0194
LM2	0.060015	0.019333	3.104346	0.0043
INR	-0.001714	0.001457	-1.176961	0.2491
C	-0.033549	0.628509	-0.053378	0.9578
R-squared	0.997900	Mean dependent var		10.23711
Adjusted R-squared	0.997450	S.D. dependent var		0.533607
S.E. of regression	0.026946	Akaike info criterion		-4.213105
Sum squared resid	0.020330	Schwarz criterion		-3.902036
Log likelihood	80.72934	Hannan-Quinn criter.		-4.105724
F-statistic	2217.526	Durbin-Watson stat		1.579595
Prob(F-statistic)	0.000000			

Source: Researcher's compilation from E-view 9

Table 2 above is an illustration of the results of the ARDL bounds cointegration test between real GDP and its determinants. The estimation indicated that manufacturing sector capacity utilization (MCU) at lag zero (current year) has positive and insignificant influence on real gross domestic product (LRGDP) while manufacturing sector output (LMO) lagged at current year has positive and significant influence on real GDP in Nigeria. The results also revealed that government investment expenditure (GINVEXP) has negative and significant effect on real GDP whereas broad money supply (LM2) influenced real GDP positively and significantly. More so, the estimation results showed that negative and insignificant relationship exists between interest rate (INR) and real GDP in the Nigerian economy. From the results, the coefficients of MCU and LMO are 0.001030 and 0.351626 while the associated p-values are 0.1856 and 0.0001. Similarly, the coefficients of LGINVEXP, LM2 and INR are -0.034602, 0.060015 and -0.001714 whereas their respective p-values include 0.0194, 0.0043 and 0.2491 respectively. These results are in line with the structural change theory of Todaro and Smith (2011). These authors postulated positive relationship between economic growth and industrialization. They also opined that underdevelopment observed in the developing economies are as results of resources underutilization arising from institutional and structural factors that originated from both international and domestic dualism. Accordingly, Jhingan (2011) postulated that manufacturing sector plays a very crucial role in the economic development of the developing countries. The findings are also in accordance with the endogenous growth theory, which argued that economic growth is endogenously determined within the system. Empirically, these results are in line with the findings of Bennett, Anyanwu & Kalu (2015), Chukwuedo & Ifere (2017), Emmanuel & Saliu (2017) and Sola, Obamuyi, Adekunjo & Ogunleye (2013) who carried out similar research on the related topic in Nigeria and found positive relationship between the two variables; however, the results negate the findings of Akinmulegun & Oluwole, Adofu and Taiga & Tijani (2015) who also conducted research on the similar topic in Nigerian economy and found negative link between manufacturing sector and economic growth.

More so, results showed that F-statistic is 2217.526 while the Prob(F-statistic) is 0.000000 which indicate that the combined influence of the exogenous variables on the dependent variable is statistically significant. The results also showed that multiple coefficient of determination, R^2 is 0.997900. The result indicated that 99.8% of the variations in the dependent variable (LRGDP) are explained by the exogenous variables (MCU, LMO, LGINVEXP, LM2 and INR) while the remaining 0.2% is attributed to other factors not included in the model. Furthermore, the results revealed Durbin Watson (DW) statistic of 1.579595, which implies that serial correlation is not found in the model. To further confirm this claim, Breusch-Godfrey serial Correlation LM test was carried out, and the results showed Observed R-squared value of 1.482348 while the Prob.Chi-Square is 0.4766. Since the Prob.Chi-Square is greater than 5% critical value, the study accepts the early assertion and concludes that serial correlation does not exist in the model.

Furthermore, the study applied Ramsey RESET to test for the model specification. From the results, the t-statistic and F-statistic values are 1.214227 and 1.902802 with the associated p-value being 0.3054. The p-value of 0.3054 is greater than 5% critical value; hence, the study concludes that the model is well specified. The study tested for normality distribution among the series using Jarque-Bera approach. The results revealed the Jarque-Bera value of 1.598866 and p-value of 0.449584, which is greater than the 5% chosen level of significance. Thus, the study concludes that there is normality distribution in the data series used in the investigation. More so, the presence of homoscedasticity was tested by employing heteroscedasticity test: ARCH approach. The results showed evidence of homoscedastic in the model. The results indicated Obs*R-squared value of 3.185005 and prob.Chi-Square value of 0.0743, which exceeds 5% critical value.

Table 3: ARDL Short-run and Long-run Coefficients Tests between Real GDP and its determinants

Short Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(MCU)	0.001030	0.000759	1.357166	0.1856
D(LMO)	0.351626	0.074453	4.722811	0.0001
D(LGINVEXP)	-0.034602	0.013945	-2.481335	0.0194
D(LM2)	0.060015	0.019333	3.104346	0.0043
D(INR)	-0.001714	0.001457	-1.176961	0.2491
ECT	-0.330777	0.059200	-5.587451	0.0000
Cointeq = LRGDP - (0.0031*MCU + 1.0630*LMO - 0.1046*LGINVEXP + 0.1814*LM2 - 0.0052*INR - 0.1014)				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MCU	0.003114	0.002313	1.346649	0.1889
LMO	1.063028	0.230375	4.614341	0.0001
LGINVEXP	-0.104609	0.033688	-3.105234	0.0043
LM2	0.181436	0.038206	4.748882	0.0001
INR	-0.005183	0.004219	-1.228476	0.2295
C	-0.101424	1.908314	-0.053148	0.9580

Source: Researcher's compilation from E-view 9

Table 3 above depicts the results of ARDL short run and long run coefficients tests between real GDP and its determinants in Nigeria. The results indicate three (3) cointegrating equations in the model. Since there is at least one cointegrating equation found in the model; the study concludes that significant long relationship exists among the variables such as MCU, LMO, LGINVEXP, LM2 and INR. This is evidenced by the p-values of the variables. From the results, the p-values of LRGDP, MCU, LMO, LGINVEXP, LM2 and INR are 0.0001, 0.0043, 0.0001 and 0.2295 respectively at 5% level of significance. More so, the results showed evidence of short run relationship among the variables. This is indicated by the ECT p-value of 0.0165 which is less than 5% critical value.

Similarly, the ECT value of -0.330777 indicates that short run relationship also exist among the variables and it also showed that the a priori expectation of the study is met. This means that the stability condition required to conduct this type of investigation is satisfied. Thus, the ECT is significant, fractional and negative which justifies the above claims. From the results, the ECT value is -0.330777 whereas the p-value is 0.0000, which indicates that the speed of adjustment from short-run disequilibrium towards long-run relationship is 33.1%.

4.3 Pairwise Granger Causality test

Pairwise Granger Causality test is utilized to examine the causality between manufacturing sector output and economic growth in Nigeria. The results are shown in table 4 below.

Table 4: Pairwise Granger Causality test

Null Hypothesis:	Obs	F-Statistic	Prob.
MCU does not Granger Cause LRGDP	34	2.34596	0.1137
LRGDP does not Granger Cause MCU		4.69580	0.0171
LMO does not Granger Cause LRGDP	34	0.15480	0.8573
LRGDP does not Granger Cause LMO		3.53958	0.0421
LGINVEXP does not Granger Cause LRGDP	34	1.00902	0.3770
LRGDP does not Granger Cause LGINVEXP		1.23346	0.3061
LM2 does not Granger Cause LRGDP	34	4.03817	0.0284
LRGDP does not Granger Cause LM2		0.08539	0.9184
INR does not Granger Cause LRGDP	34	0.30109	0.7423
LRGDP does not Granger Cause INR		1.10926	0.3434
LMO does not Granger Cause MCU	34	2.90337	0.0709
MCU does not Granger Cause LMO		3.51280	0.0430
LGINVEXP does not Granger Cause MCU	34	2.71003	0.0834
MCU does not Granger Cause LGINVEXP		2.29945	0.1183
LM2 does not Granger Cause MCU	34	3.79108	0.0345
MCU does not Granger Cause LM2		0.53073	0.5938
INR does not Granger Cause MCU	34	1.08775	0.3503
MCU does not Granger Cause INR		1.87584	0.1713
LGINVEXP does not Granger Cause LMO	34	2.12334	0.1379
LMO does not Granger Cause LGINVEXP		2.98600	0.0662
LM2 does not Granger Cause LMO	34	5.21734	0.0116
LMO does not Granger Cause LM2		3.21987	0.0546
INR does not Granger Cause LMO	34	0.12205	0.8856
LMO does not Granger Cause INR		1.44407	0.2524
LM2 does not Granger Cause LGINVEXP	34	2.80715	0.0768
LGINVEXP does not Granger Cause LM2		1.99389	0.1544
INR does not Granger Cause LGINVEXP	34	2.04249	0.1480
LGINVEXP does not Granger Cause INR		1.10531	0.3447
INR does not Granger Cause LM2	34	1.63592	0.2122
LM2 does not Granger Cause INR		1.10135	0.3459

Source: Researcher's compilation from E-view 9

Table 4 above illustrates the results of Pairwise Granger causality test between real GDP and its determinants in Nigeria. The results revealed that indicate that unidirectional relationships run between real GDP and MCU, LMO and LM2 with causality running from real GDP to MCU and LMO, and from LM2 to real GDP. However, the results indicate that causality does not run between real GDP, and GINVEXP and INR in Nigeria. This is evidenced by the p-values of the causalities of the variables. From the results, the p-values of the unidirectional causalities are 0.0171, 0.0421 and 0.0284 respectively. These results imply that RGDP granger causes MCU and LMO while LM2 on the other hand, granger causes RGDP in Nigeria.

4.4 Policy Implications of the Results

The study investigated the influence of manufacturing sector output on economic growth in Nigeria for the period 1981-2016. The results of the ARDL short run and long run coefficients test indicated evidence of both short run and long run relationships among the variables. The results also showed that manufacturing sector capacity utilization (MCU) has positive and insignificant influence on real RGDP while manufacturing sector output (LMO) has positive and significant influence on real GDP in Nigeria. Thus, it is estimated on average that 1% increase in manufacturing capacity utilization, will lead 0.001% increase in real GDP of Nigeria while 1% rise in manufacturing output will result to 0.35% increase in real GDP. Similarly, the results revealed that government investment expenditure (GINVEXP) has negative and significant effect on real GDP whereas broad money supply (LM2) affects real GDP positively and significantly. It is also estimated on the average that 1% improve in government investment expenditure will lead real GDP to decrease by 0.35%; however, 1% increase in broad money supply will results to 0.06% increase in real GDP. More so, the results illustrated that interest rate has negative and insignificant effect on real GDP of Nigeria. Hence, it is estimated on the average that 1% increase in interest rate will decrease real GDP by 0.002% in the Nigerian economy.

Furthermore, the results of the Pairwise Granger causality test indicate unidirectional relationships between real GDP, and MCU, LMO and LM2 with causality runs from real GDP to MCU and LMO, and from LM2 to real GDP. However, the results indicate no causality between real GDP, and GINVEXP and INR in Nigeria. These results indicate that any economic policy increases real GDP will lead to improve in manufacturing sector capacity utilization and manufacturing output in Nigeria. Similarly, any economic policy that increases broad money supply will improve economic growth in Nigeria. However, other variables have no causation with the real GDP in the economy.

V. Conclusion and Recommendations

This study is an investigation of the influence of manufacturing sector output on economic growth in Nigeria for the period 1981-2016. Auto Regressive Distributed Lag (ARDL) model and Pairwise Granger causality technique were utilized in the analysis. The variables used in the study include real GDP, manufacturing sector capacity utilization (MCU), manufacturing sector output (LMO), government investment expenditure (GINVEXP), broad money supply (LM2) and interest rate (INR). Unit root test was conducted by applying the Augmented Dickey-Fuller (ADF) unit root test. The results showed that all the variables except INR were non-stationary at level; however, after first differencing, all the variables became stationary at 5% critical value. The ARDL model results indicated both long run and short run relationships exist among the variables of the study.

The results also revealed that manufacturing sector capacity utilization (MCU) has positive and insignificant influence on real GDP while manufacturing sector output (LMO) has positive and significant influence on real GDP in the economy. Similarly, it was shown in the results that government investment expenditure (GINVEXP) has negative and significant effect on real GDP whereas broad money supply (LM2) affects real GDP positively and significantly. It was also showed that negative and insignificant relationship exists between interest rate (INR) and real GDP in the economy. These results imply that 1% improve on manufacturing sector capacity utilization and manufacturing sector output will rise real GDP of Nigeria by 0.001% and 0.35% respectively while any economic policy that is able to increase government investment expenditure and interest rate by 1% will results to a decrease in real GDP by 0.035% and 0.002% respectively. More so, a rise in broad money supply by 1% will lead real GDP to increase by 0.06%. Furthermore, the results of the Pairwise Granger causality test indicated unidirectional relationship runs from real GDP to manufacturing sector capacity utilization (MCU) and manufacturing sector output (LMO); and from broad money supply (LM2) to real GDP while no causality runs between real GDP and government investment expenditure (GINVEXP) and interest rate (INR). Hence, the study recommended that government should intensify efforts toward promoting socio-economic infrastructural, macroeconomic and institutional framework of the nation in order to bring in a good relationship between external and domestic institutions with the main objective being to effectively harness the mobilized funds towards productive manufacturing sector in the country. In doing so, manufacturing sector output will improve more, leading to higher increase in the contribution of the sector to real gross domestic product of Nigeria.

References

- [1] Adesina, A.O (1992), "Productivity trends in Nigeria". Seminar paper. Department of economics, University of Ibadan.
- [2] Olorunfemi, S., Tomola, M. O., Felix, O. A. & Ogunleye, E. O. (2013). Manufacturing performance in Nigeria: Implication for sustainable development. *Asian Economic and Financial Review*, 3(9), 1195-1213.
- [3] Akinmulegun, S. O. & Oluwole, F. O. (2014). An assessment of the Nigerian manufacturing sector in the era of globalization. *American Journal of Social and Management Sciences*, 5(1), 27-31.
- [4] Adofu, I., Taiga, U. U. & Tijani, Y. (2015). manufacturing sector and economic growth in Nigeria. *Donnish Journal of Economics and International Finance*, 1(1), 1-6.
- [5] Bennett, K. O., Anyanwu, U. N. & Kalu, A. O. U. (2015). The effect of industrial development on economic growth: An empirical evidence in Nigeria. *European Journal of Business and Social Sciences*, 4(2), 127 – 140.
- [6] Kaldor, N. (1966). Causes of the slow rate of economic growth of the United Kingdom: An inaugural lecture. Cambridge: Cambridge University Press.
- [7] Teshome, A. (2014). Impacts of manufacturing sector on economic growth in Ethiopia: A Kaldorian approach. *Journal of Business Economics and Management Sciences*, 1(1), 1-8.
- [8] Pacheco-López, P. & Thirlwall, A. P. (2013). A new interpretation of Kaldor's first growth law for open developing economies. University of Kent School of Economics Discussion Papers, KDPE.
- [9] Pons-Novell, J. Viladecans-Marsal, E. (1998). Kaldor's laws and spatial dependence. evidence for the European regions. 38th European congress of the regional science association, Vienna, Austria.
- [10] Banjoko, S., Iwuji, I. & Bagshaw, K. (2012). The performance of the Nigerian manufacturing sector: A 52 year analysis of growth and retrogression (1960-2012). *Journal of Asian Business Strategy*, 2(8), 171-191.
- [11] Oyati, E. (2010). The relevance, prospects and the challenges of the manufacturing sector in Nigeria. Department of Civil Technology, Auchi Polytechnic.
- [12] Abdullahi, A. (2015). Industrialization in Nigeria: An appraisal. Lagos: Dill Ventures Ltd.
- [12] Adenikinju, A. & Alaba, O. (2010). Energy use and productivity performance in the Nigerian manufacturing sector. Centre for econometric and allied research and department of economics; University of Ibadan.
- [13] Adeola, F. A. (2005). Productivity performance in developing countries: Case study of Nigeria. United Nations Industrial Development Organization (UNIDO) Report.
- [14] Adofu, I., Taiga, U. U. & Tijani, Y. (2015). Manufacturing sector and economic growth in Nigeria. *Donnish Journal of Economics and International Finance*, 1(1): 001-006
- [15] Akinmulegun, S. O. & Oluwole, F. O. (2013). An assessment of the Nigerian manufacturing sector in the era of globalization. *American Journal of Social And Management Sciences*, 5 (1)
- [16] Akinyotu, O. (2011). The effect of globalization on Nigeria manufacturing industries. *The Nigerian Journal of Economic and Social Studies*, 48 (1): 31-52.
- [17] Amakom, U. (2012). Manufactured exports in Sub-Saharan African economies: Econometric tests for the learning by exporting hypothesis. *American International Journal of Contemporary Research*, 2 (4).
- [18] Ayodele, A.I. & Falokun, G. (2013). The Nigerian economy: Structure and pattern of development. Lagos: JODAD Publishers.
- [18] Barro, R. J. (1989). A cross-country study of growth, savings, and government. NBER Working Papers, 2855:1-57.

- [19] Chete, L. N., Adeoti, J. O., Adeyinka, F. M. &Ogundele, O. (2016). Industrial development and growth in Nigeria: Lessons and challenges. Nigerian Institute of Social and Economic Research (NISER), Ibadan, Working Paper No. 8
- [20] Chukwuedo, S. O. &Ifere, E. O. (2017). Manufacturing subsector and economic growth in Nigeria. *British Journal of Economics, Management & Trade*, 17(3), 1-9.
- [21] Dauda, R. O. S. (2013). The determinants of manufacturing sector growth performance in Nigeria. *Nigerian Journal of Economic and Social Studies*, 5 (1).
- [22] Dipak, M. & Ata, M. (2013). The African manufacturing firm: An analysis based on firm studies in Sub-Saharan African. Nigeria: Taylor and Francis Ltd.
- [23] Emmanuel, O. O. &Saliu, W. O. (2017). Hazards of manufacturing sector and economic growth in Nigeria.IJSSHE-International Journal of Social Sciences, Humanities and Education, 1(1), 1-16.
- [24] Emilia, H. (2016). The importance of the manufacturing sector in the Romanian economy. 9th International Conference Interdisciplinarity in Engineering, INTER-ENG2015, 8-9 October 2015: Procedia Technology, 22, 976 – 983.
- [25] Enebong, A. (2013). Manufacturing association of Nigeria (MAN): Nigeria's imperative in the new world trade order workshop report. African economic research consortium (AERC). Nairobi, Kenya and trade policy research and training (TPRTP).
- [26] Englama, A., Duke, O., Ogunleye, T. &Isma'il, F. (2010). Oil prices and exchange rate Volatility in Nigeria: An empirical investigation. *Central Bank of Nigeria Economic and Financial Review*, 48(3): 3148.
- [27] Imoisi A. I. (2013).An appraisal of fiscal policy measures and its implication for growth of the Nigerian economy. *Advances in Management & Applied Economics*, 3 (4): 193-204
- [28] Jinghan, M. L. (2011). The economics of development and planning (40th edition).Delhii: Vrinda Publications Limited John, O. A. & Sarah, O. A. (2015). Macroeconomic determinants of industrial development in Nigeria.Nile Journal of Business and Economics, 1, 37-46.
- [29] Kaya, Y. (2010). Globalisation and industrialisation in 64 developing countries 1980-2003. *Social Forces*, 88(3): 1153-1182.Kayode, M.O. &Teriba, O. (2015). Industrial development in Nigeria. Ibadan: University Press.
- [30] Loto, M. A. (2012). The determinants of output expansion in the Nigerian manufacturing industries. *Journal of Emerging Trends in Economics and Management Sciences (JETEMS)*, 3(6), 991-996.
- [31] Modebe, N. J. &Ezeaku, H. C. (2016). Dynamics of inflation and manufacturing sector performance in Nigeria: Analysis of effect and causality.*International Journal of Economics and Financial Issues*, 6(4), 1400-1406.
- [32] Olamade, O. O., Oyeibisi, T. O. &Olabode, S. O. (2014). Strategic ICTuse intensity of manufacturing companies in Nigeria. *Journal of Asian Business Strategy*, 4 (1): 117.
- [33] Ogbu, O. (2012). Toward inclusive growth in Nigeria. *Nigerian Journal of Economic and Social Studies*, 43(1): 145.
- [34] Olakunle, A. (2010). The impact of manufacturing capacity utilization on the economy of Nigeria: An empirical analysis. *Journal of Agriculture & Social Sciences*, 2(4).
- [35] Olorunfe, M.S, Tomola, M.O, Adekunjo, F.O. &Ogunleye, E.O. (2013). Manufacturing performance in Nigeria: Implication for sustainable development. *Asian Economic and Financial Review*, 3(9):1195-1213
- [36] Okon E. O. &Osiesie, S.W. (2017). The African manufacturing firm: An analysis based on firm studies in Sub-Saharan Africa. Lagos:Taylor and Francis Ltd.
- [37] Pesaran, M. H. & Y. Shin (1999). An autoregressive distributed lag modeling approach to cointegration analysis. Chapter 11 in S. Strom (ed.), *Econometrics and Economic Theory in the 20th Century: The Ragnar Frisch Centennial Symposium*. Cambridge University Press, Cambridge. (Discussion Paper version).
- [38] Romer, P. (1986). Increasing returns and long run growth. *Journal of Political Economy*, 94 (3): 100-137
- [39] Romer, P. (1987). Growth based on increasing returns due to specialization. *American Economic Review*, 77 (11): 56-62.
- [40] Romer, P. (1990). Endogenous technical change. *Journal of Political Economy*, 98: 71-102
- [41] Sola, O, Obamuyi, T.O, Adekunjo, F.O. &Ogunleye, E.O. (2013). Manufacturing performance in Nigeria: Implication for sustainable development. *Asian Economic and Financial Review*, 3(9):1195-1213
- [42] Simon-Oke, O. O. &Awoyemi, O. V. (2010). Manufacturing capacity utilization and industrialdevelopment in Nigeria: An assessment. *An International Multi-Disciplinary Journal*, 4 (2)
- [43] Solow, R. M. (1956). A contribution to the theory of economic growth. *Quarterly Journal of Economics*, 70 (1)Todaro, M. P. & Smith, S. C. (2011). *Economic development* (11th Edition). Edinburgh: Pearson Education Limited The World Bank (2012), *World Bank Development Indicators*.Washington D.C.

IOSR Journal of Business and Management (IOSR-JBM) is UGC approved Journal with SI. No. 4481, Journal no. 46879.

Celina Ududechinyere Ph.D "An analysis of the effect of manufacturing sector on the growth of the Nigerian economy." *IOSR Journal of Business and Management (IOSR-JBM)* 20.4 (2018): 34-46.