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Original Research Article

Manufacturing Sector and Economic Growth in Nigeria (1990-2013)

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This research work examined the empirical relationship between the Manufacturing sector and Economic Growth in Nigeria for the period 1990 to 2013 using ordinary least square method to ascertain the relationship between manufacturing, its components and economic growth. The results show that the output of the manufacturing sector contributed negatively and had an insignificant relationship to real gross domestic product growth, which was indicative of the fact that the manufacturing sector of the Nigerian economy is presently experiencing decay as a result of non-implementation of 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. The study therefore, suggests that there should be an increase in government expenditure and proper management of the expenditure on manufacturing sector to ensure stable growth in the economy; there should be promotion of financial institutions to cater for the creation of funds for the manufacturing sector; there should be a reduction in interest rate to encourage more investment in the economy which will boost the economic growth of Nigeria; there should be a moderation in exchange rate to encourage investments thereby ensuring stability in the economic growth of Nigeria and; improving in the productivity of the manufacturing sector by upgrading its technologies.

Keywords: Manufacturing, Economic growth, Government Expenditure, Inflation, Policies, Nigeria.

INTRODUCTION

Manufacturing is the production of merchandise for use or sale using labour, machines, tools, chemical and biological processing or formulation. The term may refer to a range of human activity from handicraft to high tech, but is most commonly applied to industrial production, in which raw materials are transformed into finished goods on a large scale. Industrialization has been seen as a veritable channel of attaining the lofty and desirable conception and goods of improved quality of life for the populace.

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This is because; industrial development involves extensive technology-based development of the productive (manufacturing) system of the economy. In other words, it could be seen as deliberate and sustained application and combination of suitable technology, management techniques and other resources to move the economy from the traditional low level of production to a more automated and efficient system of mass production of goods and services (Ayodele and Falokun, 2003).

The economic growth in Nigeria have been adversely affected by the prolonged economic recession occasioned by the collapse of the world oil market from the early 1980 and the attendant sharp fall in foreign exchange earnings. The economy's problems may also include dysfunctional social and economic infrastructure, excessive dependence on imports for consumption and capital goods, poor institutional framework and management strategies, unprecedented fall in capacity utilization rate in the industry and neglect of the agricultural sector, among others (Adesina, 1992). These have led to the problem of economic diversification to other sectors of the economy and also resulted in fallen incomes and devalued standards of living amongst Nigerians.

However, in considering the Nigerian economic development, it is instrumental to examine the growth and structural change in certain major aspects of the economy (Ajakaiye, 2002). The Structural Adjustment Programme (SAP) was introduced in 1986 to address these economic problems, but yet, no notable improvement took place. From a middle income nation in the 1970s and early1980s, Nigeria is today among the thirty (30) poorest nations in the world. And in spite of the country's vast oil wealth, the World Bank Development Indicators (2012) had shown that the majority of Nigerians are poor with 84.5percent of the population living on less than two dollars a day. The United Nations Human Development Index (2011) also ranks Nigeria 156 out of 179 countries, which is a significant decrease in its human development ranking of 151 in 2004; and World Bank Development Indicators (2012) have placed Nigeria within the 47 poorest countries of the world. The issue of poverty can be easily traced to mono-economic practice and underutilization of the nation's endowed resources, especially in the manufacturing sector which could have opened up windows of opportunity in job creation and economic development.

The recovery of the economy and its growth will require an urgent rebuilding of deteriorated infrastructures and making more goods and services available to the citizenry at affordable prices. The path to economic recovery and growth may require increasing production inputs – land, labour, capital and technology – and or increasing their productivity (Kayode and Teriba, 1977). Increasing productivity should be the focus because many other countries that have found themselves in the same predicaments have resolved them through productivity enhancement schemes. For instance, Japan from the end of the World War II and the United States of America from the 1970s have made high productivity the center point of the economic planning and the results have been resounding. Also, middle income countries like China, South Korea, Singapore and India have embraced boosting productivity schemes as an integral part of their national planning and today they have made significant inroads in the world industrial markets. In 2010, China ranked as No 1 in the world in terms of the manufacturing volumes of a variety of products.

Given the importance of high productivity in boosting economic growth and the standards of living of the people, it is necessary to evaluate the productivity of the Nigerian manufacturing sector. Manufacturing is assumed to be more dynamic than other sectors. A transfer of productive resources to more dynamic sectors contributes to growth (Szirimai, 2008). This will be useful in ascertaining the relative efficiency of firms, sub sectors and sectors. Knowledge of the relative efficiency of industries in relation to economic growth could aid the government in planning its programmes and policies, especially in deciding on which industries should be accorded priority.

The Nigerian manufacturing sector is however, currently faced with several challenges. The technological base is weak primarily due to lack of investment in research, development and innovation. Manufacturers depend largely on imports of machinery, equipment and spare parts, which is not sustainable due to foreign exchange limitations. The deterioration in the sector is evident from its contribution to the gross domestic product, which has averaged 4 percent in the last five years, 2004-2009 (Szirimai, 2008). In the context of the above, therefor, the study intends to examine the relationship between the manufacturing sector and the economic growth in Nigeria.

LITERATURE REVIEW

Copious literature exists in manufacturing in Nigeria written by various authors and for various purposes. This fact underscores the essence, importance and relevance of this sector in the growth of any given economy. The experiences of developed economies in relation to the roles played by the manufacturing sector buttress the fact that the relevance of the manufacturing sector cannot be overemphasized especially among the less developed countries (LDCs) or rather developing countries.

Adenikinju and Alaba (2000) conducted an empirical study which evaluated the Nigerian manufacturing sector's performance with regards to the relationship between productivity, performance and energy consumption with the manufacturing organizations. Utilizing an aggregate model, the researchers measured the changes in the total factor productivity of the sector relative to the change in energy consumption. The research concluded that efficiency and productivity of the Nigerian manufacturing organizations are indeed related to the energy supply and energy price. While the energy resources were found to play a critical role in the manufacturing sector though, it was also discovered that energy alone cannot effectively improve the performance of the manufacturing sector in Nigeria. An important point identified in the research was that the manufacturing sector is strongly attached to using old technology and as such, there is a good need for the adoption of more advanced energy-efficient technological devices and techniques. For this reason, reforms covering the prices of energy options alone do not significantly affect the performance of the sector because it is hindered by the need for improved technology and energy supplies. Thus, the reforms in the energy sector need to happen alongside technological reforms, otherwise the manufacturing organizations cannot entirely enjoy the advantages of the energy resources.

The Nigerian bureau of public enterprises itself identified some of these main barriers that affected and continue to affect, the growth and development of the Nigerian manufacturing sector. Their reasons include high interest rate, unpredictable government policies, non-implementation of existing policies, ineffective regulatory agencies, and infrastructural inadequacies, dumping of cheap products, unfair tariff regime and low patronage.

However, according to Mazumdar and Mazaheri (2003), despite this uncertainty in the business environment some Nigeria companies are successfully operating in the country and getting high returns on their investments through superior competitive performance. The researchers analyzed the strategies and management planning of two Nigerian firms that have achieved a high level of performance in the business sector. They then highlighted the main factors that contributed towards the success of these organizations. Some of these factors were the introduction of transparent management policies, proactiveness in competitive strategies, among others.

Dipak and Ata (2003), argue that the main problems facing the Nigerian manufacturing sector are the ongoing advancements in technology, as these are taking the international manufacturing market towards higher levels of consumption. When there is less protection for companies, these unprotected companies have to focus more and more towards the quality of their products and do so by increasing their expenditure on research and development. In Nigeria however, the research and development work is not being done at a good level required for the constituents to even see a steady growth in the performance of manufacturing organizations. It becomes necessary then, for the Nigerian government and the private partners to intervene in order for the situation to improve.

Enebong (2003) predicts that the level of the Nigerian manufacturing organizations' performance will continue to see a decline because as it is now, the manufacturers will have even more problems in accessing raw materials due to stiff competition from foreign firms. He theorizes that many of the policies implemented by the government in the late 1990s are still acting as barriers to manufacturing sector growth. Some of these policies include backward integration and the inward orientation strategies towards import substitution. The private sector also failed to play a significant role in the manufacturing industry; and there are certain reasons behind this such as import barriers, tariffs, licenses and other policies that resulted in raw materials unavailability.

Adenikinju (2002) blamed the government for the current inefficient performance of the Nigerian manufacturing sector. The researcher claimed that the increased interference of the government in different issues related to the manufacturing industry minimized the role of the private sector and as such, the contribution of the private manufacturers seems to be very low in terms of manufacturing output.

Theoretical Framework

There are a range of competing theories to the study of economic growth, development and diversification. Each approach has its strength and weaknesses with different ideological, theoretical and empirical conclusions. Consequently, alternative theories or models or hypotheses seeking to explain the growth of firms have been developed. These theories include;

(i) the endogenous growth model
(ii) the neo-classical theory;
(iii) managerial theory;
(iv) models with Penrose effects;
(v) theory of optimum firm size.

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 does not explain the intrinsic characteristic of economies that causes them to grow over an extended period of time. The neoclassical theory focuses on the dynamic process through which capital-labour ratios approach long-run equilibrium. In the absence of external technological change, which is not clearly explained in the neoclassical model, all economies will converge to zero growth.

The neoclassical theory sees rising GDP as a temporary phenomenon resulting from technological change or a short-term equilibrating process in which an economy approaches its long run equilibrium. The neoclassical theory credits the bulk of economic growth to a completely independent process of technological progress. According to neoclassical theory, the low capital-labour ratios of developing countries promise exceptionally high rates of return on investment. Based on this premise, it was expected that the free market reforms imposed on highly indebted countries by the World Bank and the International Monetary Fund should have prompted higher investment, rising productivity, and improved standards of living. Yet even after the prescribed liberalization of trade and domestic markets, many LDCs experienced little or no growth and failed to attract new foreign investment or to halt the flight of domestic capital. The anomalous behaviour of developing-world capital flows (from poor to rich nations) helped provide the impetus for the development of the concept of endogenous growth or, more simply, the new growth theory. The new growth theory represents a key component of the emerging development theory.

The new growth theory provides a theoretical framework for analyzing endogenous growth, persistent GNP growth that is determined by the system governing the production process rather than by forces outside that system. In contrast to the traditional neoclassical theory, these models hold GNP growth to be a natural consequence of long-run equilibrium. The principal motivations of the new growth theory are to explain both growth rate differentials across countries and a greater proportion of the growth observed. In particular, endogenous growth theorists seek to explain the factors that determine the rate of growth of GDP that is left unexplained and exogenously determined in the Solow neoclassical growth equation (that is, the Solow residual). Models of endogenous growth bear some structural resemblance to their neoclassical counterparts, but they differ considerably in their underlying assumptions and the conclusions drawn. The most significant theoretical differences stem from discarding the neoclassical assumption of diminishing marginal returns to capital investments, permitting increased returns to scale in aggregate production, and frequently focusing on the role of externalities in determining the rate of return on capital investments.

By assuming that public and private investments in human capital generate external economies and productivity improvements that offset the natural tendency for diminishing returns, endogenous growth theory seeks to explain the existence of increasing returns to scale and the divergent long-term growth patterns among countries. And whereas technology still plays an important role in these models, it is no longer necessary to explain long-term growth. A useful way to contrast the new (endogenous) growth with traditional neoclassical theory is to recognize that many endogenous growth theories can be expressed by the simple equation $Y = AK$, as in the Harrod-Domar model. In this formulation, A is intended to represent any factor that affects technology, and K again includes both physical and human capital. And there are no diminishing returns to capital in this formula, so the possibility exists that investments in physical and human

capital can generate external economies and productivity improvements that exceed private gains by an amount sufficient to offset diminishing returns. The net result is sustained long-term growth – an outcome prohibited by traditional neoclassical growth theory. Thus even though the new growth theory reemphasizes the importance of savings and human capital investments for achieving rapid growth, it also leads to several implications for growth that are in direct conflict with traditional theory.

First, there is no force leading to the equilibration of growth rates across closed economies; national growth rates remain constant and differ across countries depending on national savings rates and technology levels. Furthermore, there is no tendency for per capita income levels in capital-poor countries to catch up with those in rich countries with similar savings and population growth rates. A serious consequence of these facts is that a temporary or prolonged recession in one country can lead to a permanent increase in the income gap between itself and wealthier countries. Perhaps the most interesting aspect of endogenous growth models is that they help explain anomalous international flows of capital that exacerbate wealth disparities between developed and developing countries.

The potentially high rates of return on investment offered by developing economies with low capital-labor ratios are greatly eroded by lower levels of complementary investments in human capital (education), infrastructure, research and development (R&D). In turn, poor countries benefit less from the broader social gains associated with each of these alternative forms of capital expenditure. Because individuals receive no personal gain from the positive externalities created by their own investments, the free market leads to the accumulation of less than the optimal level of complementary capital.

Where complementary investments produce social as well as private benefits, governments may improve the efficiency of resource allocation. They can do this by providing public goods (infrastructure) or encouraging private investment in knowledge-intensive industries where human capital can be accumulated and subsequent increasing returns to scale generated. Unlike the Solow model, new growth theory models explain technological change as an endogenous outcome of public and private investments in human capital and knowledge-intensive industries. Thus in contrast to the neoclassical counterrevolution theories, models of endogenous growth suggest an active role for public policy in promoting economic growth and development through direct and indirect investments in human capital formation and the encouragement of foreign private investment in knowledge-intensive industries such as computer software and telecommunications.

METHODOLOGY

Sources of Data

The research design will be exploratory and analytical in nature. The study is based on the use of time series data. The data utilized consists of annual observations on growth (GDP) and the Manufacturing sector output. The data would be obtained from various issues of Central Bank of Nigeria statistical bulletins, Central Bank of Nigeria statement of account of annual reports and National Bureau of Statistics.

Model Specification

Undoubtedly, there are extensive research works on the role of manufacturing in the actualization of economic growth. However, there seems to be no consensus in these studies on the empirical form of the specification of a model qualifying the impact that the manufacturing sector can take or follow.

Conventionally, empirical specification of growth oriented model often follows the Solow growth model, although subsequently modified by Mankiw et al (1992) (which is termed "Augmented Solow growth model).

Solow (1957) postulated that economic growth is as a result of the accumulation of physical capital and an expansion of the labour force in conjunction with an "exogenous" factor, technological progress, which makes physical capital and labour more productive (Udah, 2010). In the simplified version presented in this study, we abstract from the household sector, an important feature of the original endogenous growth model, in order to concentrate on issues concerning industrialization. The general endogenous production function:

$$GDPPC = Aki^{\alpha} Li^{1-\alpha} K^{B} \quad \text{---------- 3.1}$$

We assume symmetry across industries for simplicity, so that each industry will use the same level of capital and labour. Then, we have the aggregate production function as:

$$GDPPC = AK^{\alpha} L^{\beta} \quad \text{---------- 3.2}$$

Where:
GDPPC = Real GDP per capita at time t
A = Total factor productivity
K = Capital stock
L = Labour.

For the purpose of this research work the above model specification will be adopted and build upon, I proxy economic growth with Real Gross Domestic Product (GDP); manufacturing (proxy by manufacturing sector output); Average manufacturing capacity utilization rate to examine the performance of the manufacturing sector, exchange rate to examine the healthy competitiveness, inflation rate and interest rate to examine the effect of institutional framework and government expenditure to check government commitment on the provision of infrastructural facilities that will attract investor. With these adjustment incorporated into the model, it can therefore be specified in the form expressed below.

$$\text{LogRGDP} = a_0 + a_1 \log M + {}_{a2} \log \text{CAPU} + {}_{a3} \log \text{EXR} + {}_{a4} \log \text{IR} + {}_{a5} \log \text{INFR} + {}_{a6} \log \text{GEXP} + U_t \quad \text{----------3.3}$$

Where:

RGDP = Real Gross Domestic Product;
M = manufacturing sector output;
CAPU = Average manufacturing capacity utilization rate;
EXR = Exchange rate;
IR = interest rate;
INFR = inflation rate;
GEXP = government expenditure;
U_t = Error term;

Parameters = a_0, a_1, a_2, a_3, a_4, a_5, a_6.

From the specified model equation above, endogenous variable is RGDP while the exogenous variables are the manufacturing sector output, the average manufacturing

capacity utilization rate, exchange rate, interest rate, inflation rate and the government expenditure.

Data Analysis Technique

The study will employ the use of Ordinary Least Square (OLS) methodology in its analysis. This will be facilitated through the use of E-view Econometric software version 7.0. To ensure that the outcome of the regression is not spurious, the data set will be subjected to a stationary test using the Augmented Dickey – Fuller test.

Interpretation of the Estimated Results

The multiple linear regression analysis was employed to capture the effect of some important macro-economic variables and manufacturing sector output that have been assumed to either directly or indirectly influence the economic growth in Nigeria for the period 1990 to 2013.

The result of the manufacturing output has a negative and non-significant relationship with real gross domestic product growth suggesting that it contribute negatively to real gross domestic product growth. The non-significant nature of this variable is indicative of the fact that the manufacturing sector of the Nigerian economy is presently experiencing decay as a result of non-implementation of policies aimed at boosting the sector. The average manufacturing capacity utilization rate has a positive and significant relationship with real gross domestic product suggesting that the manufacturing sector contribute positively to real gross domestic product growth. Exchange rate has a negative and non-significant relationship with real gross domestic product growth suggesting that the exchange rate policy is poorly managed.

Also, it is a sign of macro-economic instability. Interest rate has a negative and non-significant relationship with real gross domestic product growth suggesting that interest rate do not contribute to real gross domestic growth. Inflation rate has a positive and non-significant relationship with real gross domestic product growth suggesting that is not properly managed in the economy. It is a sign of macroeconomic instability. Government expenditure has a positive and significant relationship with real gross domestic product growth. The significant nature of the government expenditure variable implies that the expenditure made by the government in the Nigerian economy is fairly adequate. Nevertheless, it contributes positively to economic growth.

The Durbin Watson (DW) statistic is 0.97 and this is a sign of first degree auto correlation. The adjusted co-efficient of determination (R^2) is 0.899 implying that approximately 90 percent of the total variation in the dependent variable is explained by the explanatory variables.

The value of the F-statistics shows that the equation has a good fit and that all the independent variables are capable of explaining the changes in the real gross domestic product (RGDP).

SUMMARY, CONCLUSION AND RECOMMENDATIONS

Summary

This study examines the impact of manufacturing using the manufacturing sector output in the economic growth process of the economy in Nigeria. The study employs the multiple regression methodology in analyzing the relationship between Nigerian economic growth and the stated explanatory variables. The results show that the output of the manufacturing sector has a negative and non-significant relationship with the real gross domestic product growth suggesting that it contributes negatively to real gross domestic product growth. However, the non-significant nature of the average manufacturing capacity utilization rate is indicative of the fact that the manufacturing sector of the Nigeria economy is presently experiencing decay as a result of non-implementation of policies aimed at boosting the sector. The average manufacturing capacity utilization rate has a positive and significant relationship with real gross domestic product suggesting that the manufacturing sector contribute positively to real gross domestic product growth. The exchange rate and interest rate had a negative and non-significant relationship with real gross domestic product growth suggesting that both do not contribute to real gross domestic product growth and which also shows a sign of macro-economic instability. The inflation rate has a positive and non-significant relationship with real gross domestic product growth which suggests that the inflation rate of the Nigerian economy is not properly managed. While, that of the government expenditure has a positive and significant relationship with real gross domestic product growth meaning that, the expenditure made by the government in the Nigerian economy was fairly adequate and as well, contributes positively to economic growth.

Conclusion

The result of the empirical tests provides useful insight to policy formulation and implementation. It indicates that the contribution of the manufacturing sector to economic growth was below the expected threshold given the gamut of industrial policies put in place since independence. This poor estimated result could be attributed to poor infrastructure especially electricity supply and non-implementation of policies. This assertion agrees with submission of Ajanaku (2007), who argued that poor electricity supply and other factors have contributed to the dismal performance of the nation's industrial sector. The study revealed that the output of the manufacturing sector is negatively related to growth.

Therefore, it has shown that the government of the Nigerian economy has neglected the sector. It has also shown that the government must try to revive the sector and also collaborate with private individuals and investors, knowing what the sector itself has to achieve economic development and growth, due to the fact that it will assist in employment generation, stimulation of entrepreneurship, mobilizing hidden capital in the economy, provide a level class of self-employed entrepreneurs, development and utilization of local and foreign technology, stemming rural-urban migration and encouragement of equitable distribution in income and wealth. Finally, it is important to note that the efforts made by the government to increase manufacturing sector output by increasing its expenditure on capital expenditure, must be properly managed most especially on electricity power supply, which is one of the major agenda of this present civilian government in Nigeria.

Recommendations

For manufacturing to act as a catalyst for economic growth in Nigeria, the following recommendations are proposed:

1. There is need to improve the administrative, legal, and fiscal environment of the manufacturing sector.
2. Government should increase its expenditure on the manufacturing sector. Also the EFCC and ICPC

should be able to fight corruption to enable the appropriate use of funds by the government on the part of the economy like the manufacturing sector to ensure growth in the economy.

3. There should be promotion of financial institution to cater for the creation of funds for the manufacturing sector.
4. The government through its agencies should reduce the interest rate to encourage private investors and entrepreneurs to embark on investment which will enhance the economic growth of Nigeria.
5. The government through the Central Bank of Nigeria (CBN) should moderate the rate at which foreign currencies are exchanged to the Naira to enable more investments in the Nigerian economy thereby, ensuring stability in the economic growth of Nigeria.
6. The manufacturing sector needs to improve productivity through upgrading of its technologies. Technology can help to improve productivity in four major ways: better machinery that can reduce production time and costs; better methods and process controls; breakthrough into completely new ways of doing things and product designs that can improve competitive edge and reduce costs.

All these cannot be left in the hands of the government alone but banks, private individuals, multi-national companies, mass media, economic analyst and training center, should come together to assist the manufacturing sector to achieve Nigeria's economic growth and development.

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