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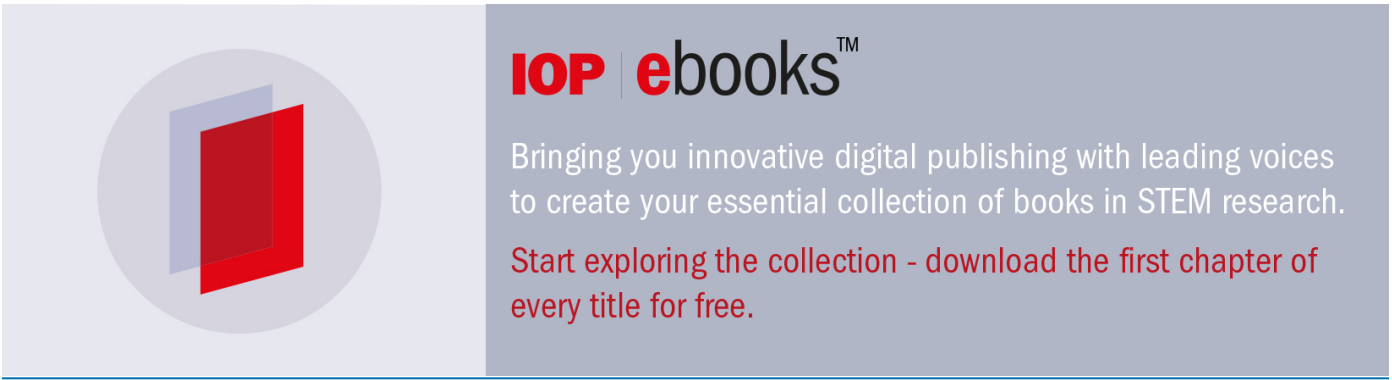

# MANUFACTURING SECTOR PERFORMANCE AND ECONOMIC GROWTH IN NIGERIA

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**Abstract-**
The paper attempted to examine the impact of manufacturing sector output on economic growth in Nigeria from 1981 to 2016. The study employed secondary data sourced from the Central Bank of Nigeria statistical bulletin for Autoregressive Distributed Lag (ARDL) model and the Granger causality techniques on RGDP, manufacturing capacity utilization (MCU), manufacturing output (LMO), government investment expenditure (GINVEXP), money supply (LM2) and interest rate (INR). Evidence of long-run and short-run relationships among the variables was established. The results showed that MCU has positive influence on RGDP while LMO also affects RGDP positively. It also showed that GINVEXP has negative effects on RGDP whereas LM2 influenced RGDP positively. Moreover, the result indicated a unidirectional causality between RGDP and MCU, LMO and LM2. Based on the above, the study suggest 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; so harnessed mobilized funds effectively towards productive manufacturing sector.

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

## 1.0 Introduction

Manufacturing has generally been described and accepted as a catalyst for economic growth and development all over the world, industrialization under industrial sector is widely conceived as a critical tool for accelerating economic growth and development. In the words of Olorunfemi, *et al* [1], the manufacturing sector provides medium to produce goods and services, facilitate good jobs, and also earn the economic agents' handsome rewards. According to Adofu, *et ali [2]*, 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 by transforming of unfinished goods to finished goods. 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[3]. 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[4]. More so, Bennett, *et al [5]* postulated that industrial development deals with the application of modern equipment, 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 spite of the nation's numerous and vast natural resources, the world Bank figures indicate that greater number of Nigerians are suffering from abject poverty, living on less than $2 a day. Similarly, Nigeria was also ranked 156 out of 179 in Human Development Index (HDI), representing a major decline in its ranking in recent times. Consequently, the nation has been placed amongst the 47$^{th}$ poorest countries of the world. (WBDI, 2012). The nature of its economic system- mono-cultural economy and gross underutilization of its natural resources is the bane of the nation's economy. The economy suffered series of problems ranging from excessive dependence on imports 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[6]. It is against the problems associated with the growth and structural change in the economy that IMF-World supported Adjustment Programme (SAP) which 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[2]. Despite the numerous vast oil wealth of the country, the World Bank Development Indicators 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. Consequently, the nation has been placed amongst the 47th poorest countries in the world. 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. While the manufacturing sector contribution to GDP in most countries that were at the same level some few years back, ranges from 28% to 34% (Malaysia and Indonesia 28%, Thailand 34%, China 30%, Brazil 35% ) but Nigeria's contribution is just 20%[7].

The economic structure of Nigeria reflects typically that an under-development nation trait, where more than 50% of the total GDP is being contributed by a single primary sector of the economy[8]. 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[8]. 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, however this sector's growth remains infinitesimal compared to the growth rate of manufacturing capacity utilization in the economy.

### 2.1.1 Keynesian Theory

The theory formulated by Lord J.M Keynes dated back to 19 36, it analyzed the challenge of unemployment equilibrium in contrast to the other school of thought-the Classical Economists, SAY's law of the market. The Keynes opined the free market economy do adjust by themselves, therefore there is no need for intervention in the market by the government in the economy since that will limit the free activities in the market[9]. The former school of thought the Keynesians believe on the hand that through Fiscal policy more impact happens in economic growth of a country much more than through monetary policy instruments to facilitate a stable and improved economy.

### 2.1.2 The Endogenous Growth Model

The Endogenous growth model was essentially postulated to answer numerous unanswered questions of the Solow Growth model. The Solow growth model was predicated on the fact that technology is an exogenous factor of economic growth. According to Romer (1987) technological change is not a rocket science rather its degree and trends can be ordered. If this is true, then technology is hence endogenous to growth instead of it being treated as an exogenous factor as propounded by Solow Model.

### 2.2 Review of Empirical Literature

Penelope and Thirlwall, (2013) in their work established that the steady growth in the manufacturing sector propels a nations' economy in the direction of positive and sustained growth because of the impact of the sector on the GDP in the nation. However, in other studies like that of Obamuyi, *et al [10]* could not entirely link manufacturing sector output and economic growth. Moreover, several authors also investigated the influence of the manufacturing sector on Economic growth, this propels a greater output for the GDP, for instance Kaldor (1966) highlighted three laws, which shows how economic growth was influenced by the manufacturing sector in an economy: He went ahead to show how an increase in output of the manufacturing sector leads to greater national output in an economy of a country. In addition, he believes that both economic growth and development is manufacturing –based and lastly, he opined that the advanced economies are industrialized economies because of the additions of this sector's output to the economy in an increasing and at a greater rate.

## 3. The Estimation Model

In estimating the model:

RGDP = f (MANU)

RGDP = F (MANU, SERV, AGRIC, GCF, POP)

Where:

Manu = manufacturing output

Serv = Service sector output

Agric = Agric sector output

GCF = gross capital formation (investment)

Pop = populations

obj1. Examined the relationship between rgdp and manf. Output

obj 2 investigate the long run r/ship btw rgdp and gross fixed capital

**Stationarity Test**

The study conducted stationary test at 0.05 level of significance. It was observed that the P- value of the augmented diggy Fuller and the Phillips-Peron test statistics were less than 0.05 and also, the test statistics are higher than the corresponding critical values. The chosen Schwarz Information Criterion (SIC) and the maximum lag length were set at 8 for the ADF while for the Phillips-Peron the spectral estimation method was set at default (Bartlett Kernel).

**Table 1: Presents the ADF Test Result**

| Variable | 1st Diff. Test Sta. | Critical Value @5% | P. Value | Integration Rank |
|---|---|---|---|---|
| *RGDP* | -3.603065 | -2.954021 | 0.0111 | I(1) |
| *MANF* | -2.946878 | -2.615817 | 0.0058 | I(1) |
| *SRV* | -9.605466 | -2.957110 | 0.0000 | I(1) |
| *POP* | -3.221548 | -2.957110 | 0.0279 | I(1) |
| *GCF* | -4.019270 | -2.960411 | 0.0041 | I(1) |
| *AGR* | -4.547426 | -2.954021 | 0.0010 | I(1) |

*p-value < 0.05 and Test Statistics>Critical Value*

*Sources: Author's Compilation 2019.*

Table 1 above revealed that real gross domestic product (RGDP), services (SRV), agricultural output (AGR), gross capital formation (GCF), manufacturing output (MANF), and population (POP) were found to be stationary at their 1st Difference.

**Table 2: The PP Test Results**

| Variable | 1st Difference Test Statistics | Critical Value @5% | P. Value | Integration Rank |
|---|---|---|---|---|
| *RGDP* | -3.595685 | -2.954021 | 0.0113 | I(1) |
| *MANF* | -2.917869 | -2.954021 | 0.0054 | I(1) |
| *SRV* | -11.06103 | -2.957110 | 0.0000 | I(1) |
| *POP* | -3.099124 | -2.957110 | 0.0367 | I(1) |
| *GCF* | -4.234801 | -2.954021 | 0.0022 | I(1) |
| *AGR* | -4.602675 | -2.954021 | 0.0008 | I(1) |

*p-value < 0.05 and Test Statistics>Critical Value; thus, variable is stationary*

*Sources: Author's Compilation 2019*

The Phillips Peron test's result above shows that, real gross domestic product (RGDP), services (SRV), agricultural output (AGR), gross capital formation (GCF), manufacturing output (MANF), and population (POP) were all stationary at first difference.

**Table 3: Co-integration Result for the BOP Model**

| Trace Test | | | | Maximum Eigenvalue Test | | |
|---|---|---|---|---|---|---|
| Hypothesized No of CEs | Eigenvalue | Trace Stat. | Critical Value @0.05 | Eigenvalue | Max-Eigen Stat. | Critical Value @0.05 |
| r=0 | 0.936016 | 173.4530 | 95.75366* | 0.936016 | 90.72122 | 40.07757** |
| r=1 | 0.643073 | 82.73183 | 69.81889* | 0.643073 | 33.99742 | 33.87687** |
| r=2 | 0.476507 | 48.73441 | 47.85613* | 0.476507 | 21.35867 | 27.58434 |
| r=3 | 0.391309 | 27.37574 | 29.79707 | 0.391309 | 16.38270 | 21.13162 |
| r=4 | 0.203295 | 10.99304 | 15.49471 | 0.203295 | 7.499936 | 14.26460 |
| r=5 | 0.100442 | 3.493104 | 3.841466 | 0.100442 | 3.493104 | 3.841466 |

∗∗ Shows that 2 co-integrating equations for Max-Eigen test @0.05 level and ∗ also indicates 3 co-integrating equations for Trace Test
The Trace Test above in table 3 indicate there are 3 co-integrating equations, also the Max-Eigen value test carried out revealed there exist 2 co-integrating equations as well. At r equals 0 and 1, both tests indicate long run relationships.

Table 4: Normalized Co-Integrating Coefficients

| RGDP | MANF | AGR | SRV | POP | GCF |
|---|---|---|---|---|---|
| 1.000000 | 0.000000 | -6.369963 | 0.380136 | 1355811. | -0.464154 |
| | | (0.39864) | (0.21683) | (355562.) | (0.28086) |

*Source: Author's Computation 2019*

The decision rule behind the use of the Normalized co-integrating co-efficient have to be that the calculated T-stat. has to be higher than or equals to two (2). The T-statistics is calculated by dividing the coefficients by the corresponding standard errors. Performing this operation, the T-statistics for AGR, SRV, POP and GCF give 15.979237, 1.7531522, 3.8131493, and 1.652617. From the T-statistics calculated, it shows that AGR, SRV, POP and GCF are key long run determinants of RGDP. The signs of the coefficients show that agricultural output AGR and gross capital formation (GCF) are positive long run significant determinants of RGDP while services (SRV) and population (POP) are negative long run significant determinants of RGDP.

**Table 5: ECM Result for RGDP model**

| Var. | Co-eff. | Standard Error | T- Stat. | Probability |
|---|---|---|---|---|
| C | 9.44 | 9.59 | 0.984204 | 0.3338 |
| D(MANF) | 0.345887 | 0.883857 | 0.391338 | 0.6986 |
| D(AGR) | 0.046014 | 0.431089 | 0.106740 | 0.9158 |
| D(SRV) | 1.960525 | 0.310055 | 6.323154 | 0.0000 |
| D(POP) | -4327781. | 3769159. | -1.148209 | 0.2610 |
| D(GCF) | -0.078936 | 0.217378 | -0.363128 | 0.7193 |
| ECT(-1) | -0.580813 | 0.141803 | -4.095902 | 0.0003 |
| *R-squared(R2)* | *0.792618* | *f-Statistic* | | *17.19909* |
| | | *Prob(f-Statistic)* | | *0.000000* |
| *Adjusted $R^2$* | *0.746533* | *DW Stat.* | *1.366312* | |

*Source: Author's Computation 2019*

From table 5, the $R^2$ (0.792618) shows evidence of good fit for the real gross domestic product (RGDP) model since it is greater than 0.5 or 50%. It indicates that approximately 79% of variability in RGDP is explained by manufacturing output (MANF), agricultural output (AGR), service (SRV), population (POP), and gross capital formation (GCF). The remaining 21% are due to other macroeconomic variables not explained by the model.
The standard error test indicates that SRV and the generated residual ECT (-1) are individually significant while MANF, AGR, POP and GCF are individually insignificant. This is also confirmed by the probability values of the coefficients of the explanatory variables of the model. When the probability value is less than 0.05, it indicates statistical significance. The implication of this is that services alone contribute significantly in the short-run to RGDP in Nigeria.
The coefficients of the explanatory variables show that manufacturing, agriculture, and services are positively related to RGDP, while population and gross capital formation are negatively related

to RGDP. This implies that one percentage rise in manufacturing output, agricultural output, and services will bring about 0.34%, 0.04%, and 1.96%, increases in RGDP while one percentage rise in gross capital formation will bring about (0.08)% decrease in RGDP in the short run.
Considering the signs of the independent variables' coefficients, manufacturing output, agricultural output, and services conformed to a-priori expectations, while gross capital formation and population do not conform. The implication of this is that there is rising unemployment despite teeming population, low capacity utilization leading to idle capital, positively contributing manufacturing but low and insignificant in Nigeria. The coefficient of the ECT (-1) which is -0.58 shows that about 58% rate of deviation from Nigeria's RGDP growth path in the previous year is corrected by the current year.
The Durbin-Watson Stat 1.366312 is greater than the R2 0.792 and less than 2. This shows evidence of no spurious regression result and absence of serial correlation respectively. The probability value of the F-statistics 0.000000 is less than 0.05. This implies that the independent variables have joint statistical significance in explaining changes in the dependent variable RGDP.

## 4. Conclusion

Based on the findings from the estimated RGDP model, the study concludes that; that agricultural output AGR and gross capital formation (GCF) are positive long run significant determinants of RGDP while services (SRV) and population (POP) are negative long run significant determinants of RGDP; manufacturing, agriculture, and services are positively related to RGDP, while population and gross capital formation are negatively related to RGDP services alone contribute significantly in the short-run to RGDP.

## 5. Recommendations

The study hereby recommends as follows:

1. The Central authorities should in conjunction with services-oriented firms should intensify effort on services export and quality domestic services which will later on boost other sectors like manufacturing and agriculture.
2. The rate of unemployment must be reduced drastically for population to positively impact RGDP in Nigeria. Programmes like the N-power should be reviewed in order for it not to render itself as a palliative measure of reducing unemployment. Population control incentives may also be put in place to prevent population explosion and rising import bill.
3. Infrastructural development projects should be immensely sponsored to promote an enabling manufacturing business environment in Nigeria
4. Idle capital should be prevented by training indigenes on their use and effectiveness as well as establishing mini-industries to employ these capitals.

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