# INDUSTRIALIZATION AND ECONOMIC GROWTH IN NIGERIA

## Kida M. I[1] and ANGAHAR J.S[2]

[1] Department of Economics, Federal University Lafia

mohammedkida@gmail.com

[2]Department of Economics, Kwararafa University Wukari, Taraba State

jacobangahar@gmail.com

**Abstract**

*This study empirically evaluated the impact of industrialization on economic growth in Nigeria. Because of the link between industrialization and economic growth, both theoretical and econometric analysis were used to examine the contribution of industrialization to economic growth in Nigeria, using GDP as the dependent variable and crude petroleum and natural gas , manufacturing and solid mineral as independent variables from 1981-2013. The study adopted ordinary least squares (OLS) in formulating the model. The methods of analysis included, Augmented Dickey-Fuller (ADF) Unit Root test, Johansen Co-integration test and Error Correction Method (ECM). The results show that crude petroleum and natural gas, manufacturing and solid mineral, significantly contribute to economic growth. On power of the model is as high as 99%. The study recommends that creating a conducive environment to achieve strong performance of the industrial sector. Sustaining efforts at generating local materials for infant industries and support the campaign of local contempt initiative.*

*Keywords:* Industrialization, Manufacturing, Economic Growth, Crude Petroleum, Solid Minerals.

## Introduction

The share of poor people in the global population has declined during recent decades. According to Chen and Ravallion (2004), one-third of the population of the world lived in poverty in 1981, whereas the share was 18 per cent in 2001. The decline is largely due to rapid economic growth in population- rich countries like China and India. There are, however, remarkable differences between countries and between regions in the developing world. Some regions and countries, notably in East Asia, are rapidly catching up to industrialized countries. Others, especially in Sub-Saharan Africa, are lagging far behind and the share of poor people in the population has even increased in some countries. Industrial development had an important role in the economic growth of countries like China, the Republic of Korea (Korea), China, and Indonesia. Along with accelerated growth, poverty rates have declined in these countries. Some countries have managed to achieve growth with equity, whereas in others inequality has remained high. In this chapter, the growth stories of seven countries – China, India, Korea, Taiwan, Indonesia, Mexico and Brazil – are described and discussed. The main emphasis is on describing their growth processes and strategies, the role of industrial development, the contribution of a range of policies to growth performance, and the impact of growth on poverty and income inequality.

According to Bolaky (2011), industries are very essential in a developing country like Nigeria because the marginal revenue products of labour in the industrial sector are higher than the marginal revenue product of labour in the agricultural sector. Based on this, releasing of labour force from agricultural sector to the industrial sector increases the marginal product of labour in the agricultural sector and increases the overall revenue and output of the society and hence contributes to economic-growth. Therefore, industrialization is an ideal policy option for sustainable economic growth in Nigeria and it is what the President Goodluck Jonathan's regime needs to achieve its transformation agenda.

Generally, the manufacturing sector which plays a catalytic role in a modern economy has many dynamic benefits crucial for economic transformation is a leading sector in many aspects. It creates investment capital at a faster rate than any other sector of the economy. Available evidence showed that the share of manufacturing value in the Gross Domestic Product (GDP) was 3.2% in 1960. In 1977, its share of GDP increased to 5.4% and in 1992 grew to 13%. The share of the manufacturing in GDP fell to 6.2 in 1993, while overall manufacturing capacity utilization rate fluctuated downwards to 2.4% in 1998 (Chete and Adewuyi, 2004).

A country is industrialized when at least one-quarter of this Gross Domestic Product(GDP) is produced in its industrial output arises in the manufacturing section of industrial sectors, and when at least one length of its total population is employed in the industrial sectors of the economy.

The manufacturing sector is to be dominant in terms of contribution to the Gross Domestic Product of any economy especially that of Nigeria (Ayodele & Falokun, 2003). An industrial sector that does not contribute at least one-quarter of the country's GDP is widely viewed as a major challenge enhancing a country's economic growth. Nigerian manufacturing sector is faced with capacity underutilization and this has posed a threat to the economic growth and development of the country. (Adewale, 2002).

Based on the above, Nigeria has designed policies to attract manufacturing and industrial activities during the colonial and postcolonial periods. In the colonial era, the focus was to extract raw materials from Nigeria to foreign based industries. Like the rest of African countries, the colonial government in Nigeria was interested in extracting raw materials for its industries at home. For this reason no conscious efforts was made to industrialize Nigeria. It used to be argued that countries should specialize in areas of production that they are best suited. Between the periphery and the centre, the centre had more advantage in industrial output and the periphery in raw materials (Jhingan, 2008).

**Concept of industrialization**

Industrialization is the process in which a society or country (or world) transforms itself from a primarily agricultural society into one based on the manufacturing of goods and services. Individual manual labor is often replaced by mechanized mass production and craftsmen are replaced by assembly lines Cap (2002). The process by which traditionally nonindustrial sectors (such as agriculture, education, health) of an economy become increasingly similar to the manufacturing sector of the economy. Sustained economic development based on factory production, division of labour, concentration of industries and population in certain geographical areas, and urbanization. *Friedman (2006)*

**Concept of Manufacturing**

Manufacturing is the production of merchandise for use or sale using labour and 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. Such finished goods may be used for manufacturing other, more complex products, such as aircraft, household appliances or automobiles, or sold to wholesalers, who in turn sell them to retailers, who then sell them to end users and consumers *Friedman (2006)*

Manufacturing takes turns under all types of economic systems. In a free market economy, manufacturing is usually directed toward the mass production of products for sale to consumers at a profit. In a collectivist economy, manufacturing is more frequently directed by the state to supply a centrally planned economy. In mixed market economies, manufacturing occurs under some degree of government regulation. *Friedman (2006)*

Manufacturing, the single most important sub-sector of industry, accounts for nearly two-thirds of industrial GDP. Within manufacturing, the most important sub-sectors are food processing, basic metallurgy, machinery and equipment, and chemical products. The production of motor vehicles, aircraft, certain electronic products and machinery and equipment are world class. Some of these industries are recipients of generous public incentives (World Trade Organization, 2004).

**Concept of Minerals**

A mineral is a naturally occurring substance, representable by a chemical formula, that is usually solid and inorganic, and has a crystal structure. It is different from a rock, which can be an aggregate of minerals or non-minerals and does not have a specific chemical composition. The exact definition of a mineral is under debate, especially with respect to the requirement a valid species be abiogenic, and to a lesser extent with regard to it having an ordered atomic structure. The study of minerals is called mineralogy. *Friedman (2006)*

**Theoretical Framework**

Industrial development is a driver of structural change which is key in the process of economic development. Megan and Joshua (2013) suggest that economic development requires structural change from low to high productivity activities and that the industrial sector is a key engine of growth in the development process. Virtually all cases of high, rapid, and sustained economic growth in modern economic development have been associated with industrialization, particularly growth in manufacturing production (Szirmai 2009). In a 2 sectors analyses: a small industrialized economy and an agricultural sector. The industrialized sector is typically located in a few urban pockets and operates, more or less like any modern industrial economy (modern or urban sector), technologically advanced. Larger agricultural sector contains primitive modes of production, vast majority of population are very poor-living at or near subsistence consumption (primitive, traditional, rural or subsistence sector); low wages, very low productivity close to zero. Workers in the industrial sector earn higher wages than those in rural sector, wage gap related to productivity gap. Assumption of duality an analytical convenience. While developed countries may have traits of dualism, the claim behind the dual economy literature is that such dualism is much sharper than LDCs
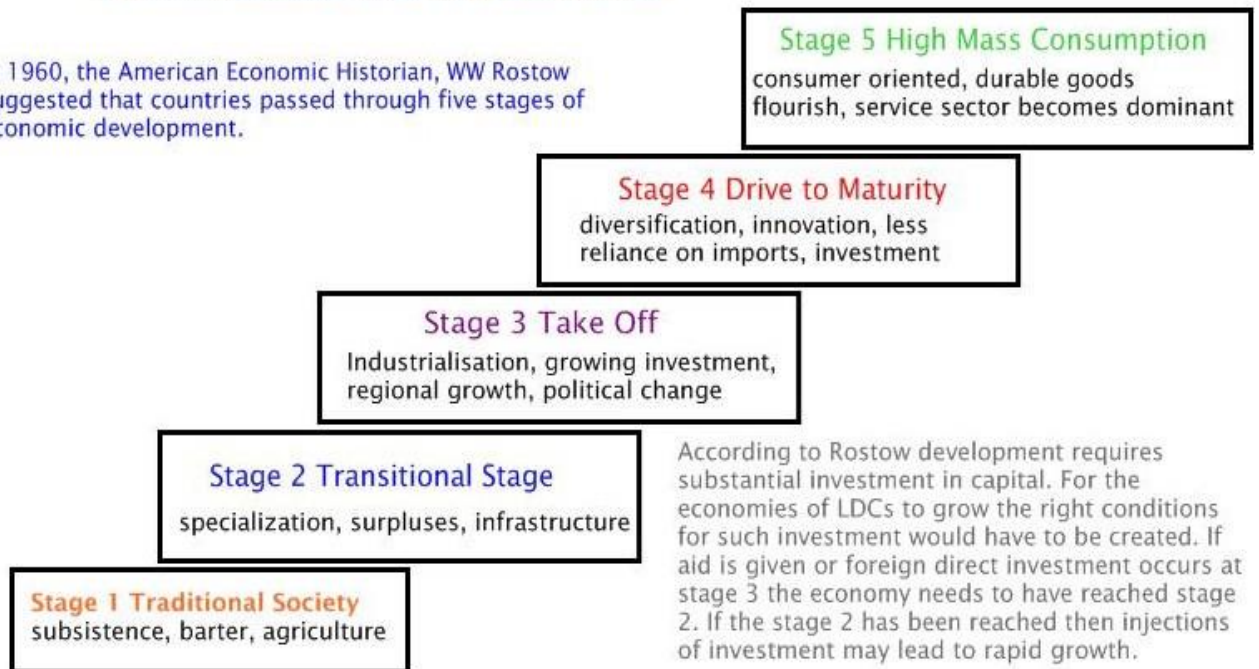
Rostow's model is one of the more structuralist models of economic growth, particularly in comparison with the "backwardness" model developed by Alexander Gerschenkron, although the two models are not mutually exclusive. Rostow argued that economic take-off must initially be led by a few individual economic sectors. This belief echoes David Ricardo's comparative advantage thesis and criticizes Marxist revolutionaries' push for economic self-reliance in that it pushes for the "initial" development of only one or two sectors over the development of all sectors equally. This became one of the important concepts in the theory of modernization in social evolutionism.

Rostow's model is a part of the liberal school of economics, laying emphasis on the efficacy of modern concepts of free trade and the ideas of Adam Smith. It disagrees with Friedrich List's argument which states that economies which rely on exports of raw materials may get "locked in", and would not be able to diversify, regarding this Rostow's model states that economies may need to depend on raw material exports to finance the development of industrial sector which has not yet of achieved superior level of competitiveness in the early stages of take-off. Rostow's model does not disagree with John Maynard Keynes regarding the importance of government control over domestic development which is not generally accepted by some ardent free trade advocates. The basic assumption given by Rostow is that countries want to modernize and grow and that society will agree to the materialistic norms of economic growth

Rostow's Model - the Stages of Economic Development

http://www.bized.co.uk/virtual/dc/copper/theory/th9.htm

In 1960, the American Economic Historian, WW Rostow suggested that countries passed through five stages of economic development.

**Stage 5 High Mass Consumption**
consumer oriented, durable goods flourish, service sector becomes dominant

**Stage 4 Drive to Maturity**
diversification, innovation, less reliance on imports, investment

**Stage 3 Take Off**
Industrialisation, growing investment, regional growth, political change

**Stage 2 Transitional Stage**
specialization, surpluses, infrastructure

**Stage 1 Traditional Society**
subsistence, barter, agriculture

According to Rostow development requires substantial investment in capital. For the economies of LDCs to grow the right conditions for such investment would have to be created. If aid is given or foreign direct investment occurs at stage 3 the economy needs to have reached stage 2. If the stage 2 has been reached then injections of investment may lead to rapid growth.

*Source: Rostow (1960).*

**Empirical Review**

Dollar and Kraay (2004), who examined impacts of increased trade on growth and inequality, found changes in growth rates to be highly correlated with changes in trade volumes. No systematic relationship between changes in trade volumes and changes in household income inequality was found, and they conclude that on average greater globalization is a force for poverty reduction. Still, the impact of trade liberalization is likely to vary between countries, depending for instance on factor endowments, and liberalization creates both winners and losers. Similarly to international trade, the impact of foreign direct investments on income inequality is likely to vary between countries.

Any foreign direct investment (FDI)-inequality relation depends e.g. on the sectorial composition of FDI, its impact on demand for unskilled workers, the skill bias of technical change induced through FDI, and the regional distribution of FDI (see e.g. Cornia, 2005). China's reforms started in the late 1970s and early 1980s with agricultural reform, which de-collectivized agricultural land and privatized land-use rights. Investments in rural infrastructure were increased, mandatory delivery of output to the state by farmers was reduced, and farmers were enabled to have a more market-oriented output mix (Ahya and Xie, 2004).

Due to reforms, agricultural growth averaged almost 10 per cent per year during 1980-1984 and 6.2 per cent per year in the 1980s as a whole (Ahya and Xie,2004), decreasing poverty

in rural areas. Successful reform in the agricultural sector contributed substantially to reform and expansion of the manufacturing sector. Due to increased productivity in agriculture, surplus labour became available to migrate to the manufacturing sector. Furthermore, due to increased income, farmers were able to increase their expenditure on goods and services produced by the domestic manufacturing sector (Dutta, 2005).

**Methods of Data Analyses and Model Specification**

The methods of analysis or estimation techniques include Ordinary Least Square (OLS) method, Augmented Dickey-Fuller (ADF) Unit Root test, Johansen Co-integration test and Error Correction Method (ECM). The estimation technique follows a three-step modelling procedure;

i. The stationarity of data must be established and the order of integration determined.

ii. After establishing the stationarity of data, Johansen co-integration test is applied. .

iii. When the variables are found to be co-integrated, an over-parameterized model. (ECM1) is developed which involves leading and logging of the variables, after which a parsimonious model (ECM2) is built which introduces short run dynamism into the model.

The test of the hypotheses would be done at 5% level of significance and as such, the generalization of the study findings would be limited to this extent.

Ho: Industrial development does not contribute significantly to Nigerian economy growth.

The study hypothesized that industrialization does not have a significant effect on the economic growth of Nigeria. The model proxied Gross Domestic Product (GDP) as the endogenous variable to measure economic growth while crude petroleum and natural gas ($CPN_g$), solid minerals ($SM_i$), and manufacturing ($MF_i$) represents the exogenous variables.

The econometric form of the model is specified as;

$GDP = f (CPN_g SM_i MF_i)$

The econometric equation becomes;

$GDP = b_0 + b_1 CPN_g + b_2 SM_i + b_3 MF_i + u_i$…………… (i)

Where;

$b_0$ = Intercept of relationship in the model/constant

$b_1 - b_3$ = coefficient of each exogenous variable

$u_i$ = Error term

From equation (i), the model becomes;

$\Delta Log\ GDP\ t-1 = b_0 + b_1 \Sigma Log\ CPN_g\ t-1 + b_2 \Sigma Log\ SM_i\ t-1 + b_3 \Sigma Log\ MF_i\ t-1 ++ \Sigma ECM\ t-1 + \Sigma\ t$ …………….. .......... (ii)

Where;

$\Sigma ECM$ = Error Correction Term

t-1 = Variable lagged by one period

$\Sigma t$   = White noise residual.

The hypothesis for the co-integration test is stated thus;

Null hypothesis $(H_0)$: $b_1 = b_2 = b_3 = 0$ (No Co-integration)

Alternative hypothesis $(H_1)$: $b_1 \neq b_2 \neq b_3 \neq 0$ (Co-integration exists)

This econometric method would be used because it is very reliable and widely used in researches to correct stationarity.

## Estimates and Analyses

Table 1: Results

| Model | Unstandardized Coefficients B | Std. Error | Standardized Coefficients Beta | T | Sig. | 95.0% Confidence Interval for B Lower Bound | Upper Bound |
|---|---|---|---|---|---|---|---|
| 1 (Constant) | -614.342 | 307.723 | | -1.996 | .055 | -1243.707 | 15.022 |
| CPN | .735 | .140 | .277 | 5.246 | .000 | .449 | 1.022 |
| SM | 432.758 | 33.929 | .641 | 12.755 | .000 | 363.365 | 502.152 |
| MF | 5.272 | 1.321 | .100 | 3.991 | .000 | 2.571 | 7.974 |

## Table 2: Result II

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | Change Statistics R Square Change | F Change | df1 | df2 | Sig. F Change | Durbin-Watson |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .998ª | .995 | .995 | 949.3093 | .995 | 2002.711 | 3 | 29 | .000 | 1.98 |

a. Predictors: (Constant), MF, SM, CPN

b. Dependent Variable: GDP

## Normality Test for Residual

The Jarque-Bera test for normality is an asymptotic, or large-sample, test. It is also based on the ordinary least square residuals. This test first computes the skewness and kurtosis measures of the ordinary least square residuals and uses the chi-square distribution {Gujarati, 2004}.

The hypothesis is:
$H_0: X_1 = 0$     normally distributed.
$H_1: X_1 \neq 0$     not normally distributed.
At 5% significance level with 2 degree of freedom.
$JB = 16.077$

While critical $JB > \{X^2_{\{2\}}df\} = 5.99147$

*Unit Root Test*

This tests the relevant variables in equation 2 which are stationary and equally to determine their order of integration. We equally use the Augmented Dickey fuller (ADF) test to find the existence of unit root in each of the time series. The summary of the ADF unit root test is presented in table two below.

**Table 2: Summary of ADF unit Root test Result**

| Variables | Data 1st diff. | 1% | 5% | 10% | status |
|-----------|----------------|-------|-------|--------|--------|
| GDP | 1.36 | -3.90 | -2.93 | -2.60 | 1(1) |
| $CPN_g$ | -1.13 | -4.31 | -2.51 | -2.93 | 1(1) |
| $SM_i$ | 1.90 | -6.79 | -3.60 | -2..93 | 1(1) |
| $MF_i$ | -3.60 | -3.61 | -2.93 | -2.60 | 1(0) |

**Source:** Authors calculation using e- views

The result reveals that all the variables were not found stationary at levels. This can be seen by comparing the observed values (in absolute terms) of the ADF test statistics at the 1%, 5%, and 10% levels of significance. In the table above the result shows that GDP, CPN, anf SM are all stationary after taking their first difference. Since all these stated variables were stationary at first difference and on the basis of this, the null of non stationarity is rejected and it is safe to conclude that the variables are stationary. This implies that the variables are integrated of order one i.e I (I). For MF the variable was stationary at levels that is order of I (0).

**Co- integration Test Results and Analysis**

Trace statistics and maximum Eigen value using methodology proposed by Johansen and Juselius (1990). Having confirmed the stationarity of the variables at 1(1) we proceed to examine the presence or non-presence of co-integration among the variables, when co-integrating relationship is present, it means that the variables have long run relationship. In the co-integrating result the likelihood ratio (LR) indicates a 2 co-integrating equations.The Johansen

co-integrating test revealed that the likelihood ratio rejects the Null hypotheses of R=0 and R=1 of no cointegration and accepts the alternative hypotheses of a long run relationship. Overall a long run relationship exists among the variables. Conclusively, the result shows that industrialization is an important factor indicator that influences the level of economic activities in Nigeria.

**Discussion of Findings**

It is important at this point to state the implication of our findings. An examination of model indicated that changes in industrial output exerted a significant influence on the country's Gross Domestic Product in the study period (1981-2013). And also CPN, SM, MF influences significantly on the GDP. Ochiama (2007), Agba and Ushie (2009) posit that, Nigeria's per capita production of electricity dwindles as her population increases and cannot support industrial activities. The effects of epileptic and insufficient electricity supply in the country are grievous as most factories are close down, while small and medium enterprises (SMEs) are unable to effectively operate in Nigeria. Consequently, some firms are compelled to generate power and this not without consequence; it increases the cost of production and the final consumer bears the burden. Corruption is also one of the most vital obstacles to industrialization in Nigeria. High level corruption among government official have enormous impact on infrastructural development in the country (Agba, Ikoh, Ushie&Agba, 2008). Corruption threatens electricity supply in the country, it was widely reported that billions of Dollars was spent during President Obasanjo's tenure on power projects, and what Nigerians got in return was "blackout" while the bank accounts (both local and foreign) of contractors swollen (Agba, e tal, 2009). Corruption could also be responsible for the lack of adequate finance for the industrial sector, since monies from Banks for Industry (BOI) ends up in wrong hands. However Ukaegbu (1991) argue that, lack of finance cannot necessary be a challenge to industrialization, since the number of Nigeria millionaires grew remarkably over the years; rather investors prefer commerce to industry. He also observes that inadequate labour is not impediment to industrial development, since many graduates in science, engineering and technical education are unemployed in Nigeria. Ukaegbu posit that the claim that inadequate physical infrastructure militate against industrialization is erroneous and a kind way of neglecting the fact that "infrastructure are the products, and not the agents of industrialization". These arguments strengthened our position in this research that foreign competition and the superficial transfer of technology among others occasioned by globalization pose the greatest challenge to industrialization in Nigeria.

**Conclusion and Recommendation**

Based on the above revelation in this study, we conclude that the industrial output has a significant impact on economic growth and development in Nigeria. Furthermore, the analysis reveals that CPN, SM, MF has a positive impact on economic development in Nigeria though significant but varies. To achieve the level of economic growth and development that is desired, the government have to strive to reduce the challenges of manufacturing. Industrial sector is

continues to be the backbone of economic growth and development based on this fact, and revelation from the empirical analysis conducted on this sector in Nigeria, we make the following recommendations:

1. Creating a conducive environment to achieve strong performance of the industrial sector.

2. Government should increase investment in solid minerals in order to boost the activities of mining in Nigeria.

3. There is also the need for proper allocation and management of existing industries so as to ensure roper and positive linkage effects on the economy.

4. Development of strong institutional structures to support the growth and development of industries in the country.

**References**

Agba, A. M. O., Ushie, E. M., Ushie, M. A., Bassey, A. O. &Agba, M. S. (2009). Human Development Trend in Nigeria: The Need for Concrete Implementation of the Seven Point Agenda. *Nigerian Journal of Social and Development Issues,* 6 (1), 15-28.

Adeola, F. A. (2005) Productivity performance in developing countries: Case study

of Nigeria. United Nations Industrial Development Organization (UNIDO) Report.

Ayodele, A.I & Falokun, G. (2003). The Nigerian Economy: Structure and Pattern of

Development, JODAD Publishers.

Babatunde, G. M. (2003). Presidential Address on the occasion of the Fulbright Alumni Association of Nigeria Third Annual Conference, held at University of Nigeria, Nsukka.

Bolaky F, (2011),  Toward Inclusive Growth in Nigeria. The Brookings Institution's Global

Economy and Development Policy Paper. No. 2012-03, June

Cap, C. V. (2002). Marx and Engles on Economic Globalization. *Society and Thought,* 15 (2), 241- 245.

Chen and Ravallion (2004),  Industrialization and trade globalization: What hope for Nigeria?

International Journal of Academic Research in Business and Social Sciences, 2(6), 157-170.

Dutta,P (2005). "The Determinants of Manufacturing Sector Growth Performance in Nigeria.

"Nigerian Journal of Economic and Social Studies, Vol. 5

Dollar and Kraay (2004) Strategic Factors in Economic Development. New York: W.F. Humphrey Press.

Friedman, David (2006). "No Light at the End of the Tunnel". Los Angeles Times. New America Foundation. Retrieved 2007-05-12.

Joseph, Keith (1976). "Monetarism Is Not Enough". Center for Policy Studies. Margaret Thatcher Foundation. Retrieved 2007-05-12.

Jhingan, M,L(2008).

Megan Kreiger and Joshua M. Pearce (2013). Environmental Life Cycle Analysis of Distributed 3-D Printing and Conventional Manufacturing of Polymer Products, ACS Sustainable Chemistry & Engineering, DOI: 10.1021/sc400093k Open access.

*Rostow, W. W. (1960).* "The Five Stages of Growth-A Summary". *The Stages of Economic Growth: A Non-Communist Manifesto. Cambridge: Cambridge University Press. pp. 4–16.*

Szirmai G, ( 2009). Industrial Development in Nigeria. Ibadan: University Press.

World Trade Organization, (2004). World Trade Organization Indicators, Washington D.C