# AN OVERVIEW OF STRUCTURAL FACTORS AND INDUSTRIAL SECTOR DEVELOPMENT IN NIGERIA (1970-2015). A CALL FOR A PROGRESSIVE APPROACH TO INTERNATIONALIZATION OF ECONOMICS EDUCATION IN NIGERIA

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**Abstract**

Internationalization of economics education in Nigeria is a vital tool for creating awareness of the competitive and developmental strides of Nigeria economy. The global economy advocates growth, development and a competitive stand for nations, hence resources are to be harnessed and exploited for industrial/manufacturing products that can withstand the international market and have a niche. However domestic resources gap has remained a constraint in the industrial goal of Nigeria. This signals the need for conscious effort cum policies towards the attraction of foreign investment in the industrial sector. This study was setup to assess the relationship between the structural factors and industrial output in Nigeria from 1970-2015. Time series analysis was utilized invoking the augmented Dickey Fuller and Philip Perron test for unit roots. It was found that almost all the variables are non-stationary. This prompted the use of Engle-Granger two-step technique to test for cointegrating relationships among the variables. The cointegrating relationship was found and the appropriate error correction model adopted to estimate the parameter of the model. The empirical results show that Nigeria industrial production to a large extent is influenced by trade openness, macroeconomic stability and the size of public sector expenditure. A key finding of this study is the state of infrastructure, particularly power generation. Also, capacity utilization in the industrial sector remains a setback. A market based free enterprise system with investor need be put in place. Investment in human capital development, research and development (R/D) should receive urgent attention. However, the achievement of the aforementioned is hinged on a robust economics education program that will open a vista of avenues for scholars, the public, stakeholders, local and foreign investors to identify the potentials of the industrial sector of the Nigerian economy. A stimulating and progressive approach is therefore the internationalization of economics education of Nigeria which will open the window for the industrial sector to receive the required global attention.

**Keywords:** Structural factors, industrial sector development, economics education, internationalization and economic development.

A progressive economics education is very vital for the understanding of the intricacies of the economic system of any nation. In Nigeria, which is a mixed economy, the economic situation in both the private and public sectors need to be well understood, articulated and harmonized for growth and development of the nation. A progressive economics education, even if it is only the basics, is crucial for the citizenry to obtain. Such an education offers an opportunity for every Nigerian to act right and be a useful member of the society not only on economic matters but in overall behaviour. Both at the micro and macroeconomics levels, the subject matter of economics remains the study of the problem of consumption, production, exchange and distribution of wealth, as well as the determination of the

values of goods and services, the volume of employment and thedeterminants of economic growth and development (Jhingan, 2000). The causes of poverty, un-employment, underdevelopment, inflation and other various economic problem and steps to remove them form part of the tenets of economics. Developments, industrial processes and structural factors of the economy are all issues of interest in economics and its education.

The central objective of economic policy in Nigeriais to accelerate development. Economic development is a means of raising living standard of the people. Technically therefore, development is for those whose living standard has not been rising. It is worthy to note that living standards or the quality of life of people cannot be improved without technological advancement and industrialization. Historical evidences have shown industrialization to be positively correlated with economic advancement and development (Orji, 2001). Thus, in economic development literatures prominence is given to industrialization. It is believed that with industrialization the several problems of Nigeria could be solved and the gap between other advanced nations and Nigeria will be effectively reduced.

Typically, the industrial sector is composed of a number of subsectors like manufacturing, mining, building and construction, electricity, water and gas and so on. However, manufacturing is always singled out as the most dynamic subsector. Manufacturing plays the catalytic role in a modern economy and can generate benefits crucial for economic transformation. A country is considered to be industrializing when manufacturing output forms a larger part of her national output or GDP. For the manufacturing sector to perform as expected, a reasonable amount of investment needs to be channeled to the sector. Concerted efforts have been made by successive Nigerian administration to attain appreciable growth in manufacturing, but the economy is still plagued by inadequacies like low servings and capital, managerial, entrepreneurial and technological deficiencies. Besides, the required investments and capabilities to enhance growth in the manufacturing sector are hard to find in the domestic economy. Domestic deficiencies and gaps would to be augmented by foreign investments, aids and grants.

Successive governments in Nigeria have adopted measures to strengthen the inflow of funds. Ample incentives have been offered to attract foreign investors into the country to give impetus to industrial process development.

**Statement of the Problem**

The journey towards industrial development in Nigeria has been obstructed by several factors and rigidities such as, the initial conditions at independence, the economy, political and climatic environment, the strategy adopted and the policies used by different administrators. An examination of the industrial sector's performance over the years shows that the share of manufacturing to GDP has been relatively low (Orji 2001). There is also limited diversification, and exports of industrial products have been low and restricted to the traditional labour intensive manufacturing types. The sector has not contributed significantly to the attainment of self-reliance in the supply of basic and intermediate and exportable goods that can generate substantial foreign exchange earnings. Light consumer goods industries dominate and thus prevent adequate forward and backward linkages. The technological base to support growth in manufacturing activities is poor, making product quality less able to compete with international standards. The machines and equipment used in the sector are obsolete, ageing and in most cases malfunctioning (Anyanwu, 1999,) writing on productivity in the Nigerian manufacturing industry, observe that most machines that are in use are obsolete and the cost of maintaining them very high. He also opined that they should be replaced with modern machines

that have better product designs and faster in processes. These conditions put together have induced the economy to resort to importing almost all its manufactured needs. The Nigerian economy generally is characterized by declining productivity, high levels of capacity underutilization, high rates of inflation and unemployment, balance of payment disequilibria and volatile exchange rate regime.

In the face of the above problems, this study sought to find out if there is any relationship between the economic structural factors; foreign direct investment, capacity utilization, electricity generation, trade liberalization, human capital formation, size of public sector expenditure, and inflation rate in the Nigerian economy and industrial sector output. There are scholarly works on industrial sector and Nigerian economic development, such as Ekpo (2004). Sonobe, Kawakani, &Osuka (2003).Ajayi (2003), Aninat (2002), Alokan (2004), Obioma and Ozughalu (2004) that used other economic variables such as gross domestic product, manufacturing production index, agricultural production index, and nominal exchange rate to examine their impact on the economy but there still exists research gap on the phenomenon of industrialization and development. The gap has to be closed by introducing the aforementioned economic structural factors of this study.

**Objective of the Study**

The broad aim of this work is to empirically investigate the impact of the following structural factors: foreign direct investment, capacity utilization, electricity generation, trade liberalization, human capital formation, size of public sector expenditure, and inflation rate on industrial sector development in Nigeria. Specifically the study sought to:

i. Investigate the degree of relationship between the structural factors and industrial output in Nigeria.

ii. Evaluate past and current efforts designed to promote industrialization in Nigeria.

iii. Make recommendations to government (policymakers) on the best policy options that will enhance the development of the Nigerian industrial sector.

**Research Questions**

To achieve the objectives specified, the following questions have to be answered:

Is there a significant relationship between the Nigerian industrial output and the structural factors mentioned?

What efforts have so far been made to promote industrialization in Nigeria?

What is to be done to facilitate industrial sector development?

**Research Hypothesis**

To investigate the economic phenomenon under study, the main hypothesis of this study is there exists no significant relationship between the Nigeria's Industrial output (endogenous variables) and the structural factors, that is, foreign direct investment capacity utilization, electricity generation, trade liberalization, human capital formation, size of public sector expenditure and inflation rate (exogenous variables).

**Significance of the Study**

This study remains significant on the realization that industrialization and economic advancement in Nigeria may remain a mirage if the country continues to produce and export only

primary products. The manufacturing sector plays a pivotal role in the economic transformation of all nations and promotes wider and more linkages among different sectors. With the existing gap between domestic service and the required investment, as well as the gap between export earnings and the required imports of manufacturing inputs, incentives that will encourage industrialists into the country become very imperative.

Industrialization as a means of reducing import dependence and unfavorable terms of trade is achievable through diversification in the production sector. The dilemma facing Nigeria is how to take off on the part of industrialization without adequate supplies of domestic capital, entrepreneurs, skilled manpower, infrastructure and supporting services. These characteristics together with small market and the lack of transport linkages have made industrial investment in Nigeria risky and costly. This study, therefore, is of great significance because it seeks to examine the contribution of the structural factors aforementioned in this study to industrial sector development in Nigeria and by so doing contribute to the existing body of knowledge on industrialization in Nigeria. It will also lay bare the conditions in the industrial sector allowing investors to make their decisions.

This investigation covers a period of 46 years (1970-2015). The available time series data of these periods are used to access the impact of proposed causal variables on industrial output. This period is deemed long enough to provide sufficient evidence for reliable analysis, more significantly as it captures different era in the Nigerian economy.

**Conceptual Issues**

The concept of industrialization may be seen as the process of transforming raw materials with the aid of human resources and capital goods into consumer goods, new capital goods, and social capital. Obioma and Ozughalu(2004). See industrialization as the introduction and/or expansion of industries in a pace, region co country, etc. industrialization is often in a narrow sense limited to the development of manufacturing industry. Okongwu (1986) sees the period of massive technological progress as periods of industrialization.Indeed, technological progress implies industrialization. Hence, industrialization is not limited to development in manufacturing industry/sector, it also relates to other industries/sectors, such as; banking, building and construction, mining and quarrying, communication and real estate. Rapid economic development involves rapid technological transformation. Rapid technological transformation, for short implies rapid industrialization.

An intercourse with economic history reveals that the mother of industrialization is the industrial revolution that occurred in Europe within the $18^{th}$ and $19^{th}$centuries. Industrialization comes in many forms and strategy. The industrial policy of a country may be inward looking, based on import substitution industrialization strategy (ISI) or outward looking, based on export promotion industrialization strategy (EPI). Import substitution industrialization (ISI) as Nyong(2005) has it, is focused on the production of consumer goods to substitute for imported goods. Export promotion on the other hand, refers to government's effort to expand the value of a nation's export through export incentives and other measures so as to generate foreign exchange and improve the current account of the balance of payments (Todaro and Smith, 2003). Industrialization may also be capital intensive or labor intensive. Capital intensive industrialization involves the use of more capital than labor in the production process, whereas the convert is the case for labor intensive industrialization.

Industrial sector development in Nigeria started soon at the attainment of political independence, Nigeria pursued her own industrial strategies through industrial production at the realization that the termination of political dependence will lead naturally to the concern of ending

economic dependence. Industrialization as a key to economic transformation has been a constant team behind industrial promotion efforts in Nigeria, and in all ramifications, it is a necessary ingredient of economic policy for all developing countries since it is synonymous with development. Industrial has a superior linkage effect that can ensure take off into sustained growth and development. The delight for industrialization in the Nigerian economy derives from the past relationship with colonial economic patterns that was based on supplying raw materials to the metropolitan countries and importing manufactured products from them, leading to the unequal distribution of gains from trade between developed and developing nations. According to the Singer-Prebisch-Myrdal-thesis, the accrual of gains from trade is heavily biased in favor of the advanced countries, which not only retain the gains from increased productivity in their own countries but also appropriate the gains from increased productivity in the developing countries in terms of lower prices for their raw materials. Anaele (2012) had it that foreign trade has retarded industrial development in developing countries and contrary to received doctrine, has increased international inequalities.

The quest for industrialization is wide spread, but they are signs of severe problems in Nigeria's experience with industrialization (Anaele, 2012). Insufficient agricultural investment exhibited by rising food imports, and the failure of export earnings to grow fast to provide needed industrial inputs have been major areas of difficulties. Industrial growth has slowed as the limits of import substitution for consumer goods have been reached and intermediate and capital goods have failed to emerge. Udoka (2013) had it that current industrialization efforts in Nigeria have been disappointing both in their inability to absorb the large numbers of unemployed that are attracted to urban areas, and its limited contributions to sustainable development.

Industrialization is not merely the isolated installation of foreign designed and foreign fabricated machinery in alien environment, but an integrated process that involves the ability of a nation such as Nigeria to generate its own manufacturing processes by a systematic incorporation of local as well as foreign ideas in the adaptation, fabrication and invention of technologies and appropriate raw materials into finished valuable goods (Orji, 2001). The economic objective of Nigeria should center principally on the contribution of industries to economic development, especially on the employment issue, poverty reduction and the relationship between gross national product (GNP) and gross domestic product (GDP).

Over reliance of Nigeria on oil revenue has limited the contributions of the non-oil sector to industrial development. The situation has made import substitution in industries unachievable by relying on imported inputs of machinery and raw material in the industries. This has made capacity utilization in Nigerian industries vulnerable to fluctuations in the availability of foreign exchange which always alignswith oil price volatility. Widespread underutilization of capacity due to inability to import raw materials and spare parts is a recurrent problem in the economy of Nigeria. The data in table 1show considerable variation in the industrial sector scenario over time.

The manufacturing sector has continued to be characterized by low production as a result of the failure of the government to provide efficient infrastructural facilities. Manufacturers have had to invest huge capital funds to provide alternatives for their operation with the consequence that domestic industries carry high cost/price structure; resulting in the loss of competitiveness for their products in both the domestic and foreign markets. The manufacturing subsector of the Nigerian industrial economy is characterized by high cost of production and low production which makes the cost of locally produced goods incapable of competing favorably in the international market. There is also the underdevelopment of other sectors of the manufacturing subsector such as small and medium

scale manufacturing enterprises. Small and medium scale manufacturing outfits exist in large numbers and in numerous locations in Nigeria especially in the eastern areas of the country. However their potentials in the industrial sector development have not been explored (Oyeyinka-Oye, 2001). Closely related to this is low degree of backward linkages in terms of the usage of local raw materials and backward integration within and between industries.

**Structural Factors**

Structural factors in this study are conceptualized as some of the basic and essential ingredients of the Nigerian industrial sector that can easily be identified in their contributions. Ndebbio (2006) viewed the economic structures as the essential parts of the economy. Todaro (1982) saw them as the organization, institutional and social framework of any economic system. The focus,on the structural factors is as a result of the significant role they play in the overall development of the industrial sector. The structural sector involved in this study and whose impact is investigated using data for the period 1970-2015 are foreign direct investment, capacity utilization, trade liberalization, electricity generation, size of the public sector expenditure, human capital formation and inflation rates on investment.

**Economic Development**

Development in a generic sense is conceptualized as the ability of humans to adapt and control their environment as to live a more satisfactory life through the exploitation of the resources of nature. Economic development theorists have identified the availability of natural resources, the levels of capital accumulation and technology, the quality of human capital, organization of production, the socio-cultural setting of the people and a strong and efficient administrative and political structure as important determinants of economic development (Uwatt, 2004). Economic development is a basic ingredient of transformation which is a fundamental national objective because the primary reason for creating a nation state is to improve the living condition of citizens of the state. Economic development connotes structural transformation, advancing technology, sustainability and equity. Poverty in all ramifications and manifestations is antithetical to economic development (Fajingebsi and Uga 2003). Obioma and Ozughalu (2004) agree that economic growth and development are continuous processes with stimulating effects in the economy. Economic development involves the allotment and utilization of resources and the increase of efficiency culminating in the improvement of the standard and quality of living of the members of the nation-state. Development in economic terms involves quality changes that take place in an economy and society and is a qualitatively higher step of macro-economic evolution. The rapidity of structural transformation in modern economic development show the changes in the distribution of labor force among the major sector of the economy. Accelerated shifts in allocation of products among types and sizes of producing firms and consequently in the allocation of labour force are concomitants with industrial development which translates to economic development.

**Theoretical Issues**

Development economics provide some theoretical linkages between industrialization, economic structures and development. The classical theories of economic development as represented by Rostow's linear stages of economic growth and development theory, theories that relate to patterns of structural change, the international dependence revolution, the neo-classical counter revolution and

the Gerschenkron's model of economic deprivation are relevant theories worth consideration. The linear stage of economic development considers the process of economic development as a series of successive stages which nations have to pass, namely; the traditional stage marked by primitive technology based on customs and traditions, the preconditions for takeoff involving a process of transition stimulated by primary exogenous influences in the economy, takeoff to sustain growth which is the critical stage when the economy and society are transformed leading to a steady rate and development, the drive to maturity, which sees the impact of growth and modern technology transmitted to all economic activities that stabilizes development and, the age of high mass consumption which witnesses the leading economic sector shifting towards consumer goods and services production. It could be inferred that the growth theory of Rostow implies that rapid industrialization is important at some stages of economic development. Related theories on structural change pay attention on the mechanism by which underdeveloped economies transform their domestic economic structure from a heavy emphasis on traditional subsistence agriculture to an advanced industrially diverse manufacturing and service economy. The theories employ the tools of neoclassical price and resource allocation model as well modern econometrics to explain how this transformation occurs (Todaro and Smith, 2003). One of the important theories that relate to structural change is the two-sector surplus labour theory of Arthur Lewis which posited that economic development takes place when capital accumulates as a result of the withdrawal of surplus labour from the subsistence sector to the capitalist sector that uses reproduce able capital. An improvement of the Lewis theory is the Fei-Ranis theory,which relates to an under developed labour surplus and resource poor economy in which the majority of the population is engaged in agriculture characterized by unemployment and high rate of population growth. With time, there will be an emergence of an active and dynamic industrial sector that ushers in economic development (Obioma and Ozoghalu, 2003). Hollis B Chenery examined patterns of development for numerous developing countries in empirical studies using time series over long periods at different levels of per capita income of countries to identify different characteristics of the development processes such as shift from agriculture to industrial production, steady accumulation of physical and human capital, the change in consumer demands from emphasis on food and basic needs to desires for diverse manufactured goods and services, the growth of cities and urban industries and the decline in family size (Todaro and Smith, 2003).

The international dependence theories consider less developed countries as bedeviled by institutional, political and economic rigidities, both domestic and international, and caught up in a dependence and dominance relationship with rich countries. Within this general approach are three major streams of thought namely the neocolonial dependence model, the false-paradign model and the dualistic development thesis.

Gerschenkrons model argued that industrial growth emanates from the context of economic deprivation. The deprived economy model propounded that a number of benefits are conferred on industrial late comers that may promote a rapid leap out of backwardness into sustained economic growth.

## Methodology

### Analytical Framework

The theoretical underpinning of this framework is drawn from the classical theories of development. The neo-classical growth and development theory assume that industrial production takes the form of augmented neo-classical production function of the form:

Y= f(K,L) ---------- (1).

Here the neo-classical economist argued that output Y depends on the input of capital, K and labour, L. however, mere increase in capital and labour may not transform into increase in output or economic growth and development. The international dependence model views under development in terms of international and domestic power relationship, institutional and structural economic rigidity and the imagined proliferation of dual economies in the world. The dependence theorists emphasize external and internal institutional and political constraint on economic and industrial development.

The neo-classical counter revolution or neo-liberal theory emphasized the beneficial role of free market, open economies and the privatization of inefficient public enterprises. Failure to develop, according to this theory, is not due to exploitative, external or internal force as expounded by dependence theories. Rather, it is primarily the result of too much government intervention and regulation of the economy.

In this study an eclectic approach which draws on the various strands of classical theories of development is adopted. A battery of studies on the determinants of the industrial performance of African countries supports this approach for instanceAdenikinju and Olofin (2000), Adenikinju and Chete (1996), UNIDO, (1995).

The factors which affect industrial development in Nigeria can be seen as; trade liberalization policies, the macroeconomic policy environment, the external environment, and the structural bottle necks of the economy. So far, there is no single theory of economic development that fully incorporates all these factors in explaining industrial development, hence, the eclectic stands of this study.

**Model Specification**

The study is based on an eclectic approach and the model developed may appear adhoc. Nevertheless, the variables used have support from both empirical and theoretical literature.

The empirical estimation of the model is of the form;

INDU = f (OPNSS, AGGEXP,INF,PSENROL,NETFDI, CU, ELEC) ----------(2)

Where;

INDU = INDEX of industrial production/development

OPNSS = trade openness index

AGGEXP = the growth rate of government expenditure

INF = the rate of domestic inflation

RGDP = the growth rate of real GDP

NETFDI = net foreign direct investment flow

PSENROL = primary school enrolment rate

CU = capacity utilization

ELEC = electricity production

The equivalent parametric form of the estimated regression can be specified as follows:

$INDU = \beta_0 + \beta_1 OPNSS + \beta_2 AGGEXP + \beta_3 INF + \beta_4 PSENROL + \beta_5 RGDP + \beta_6 NETFDI + \beta_7 CU + \beta_8 ELEC + Є$ ---------- (3)

Where Є is the error term and other varieties are as previously defined. From previous discussions, the expected relationships between the dependent variable and each of the regressors are as follows:

$B_1 > 0, \beta_2 < 0, \beta_3 < 0, \beta_4 > 0, \beta_5 > 0, \beta_6 > 0, \beta_7 > 0, \beta_8 > 0.$

**Method of Data Analysis**

In order to carryout this study, a four step approach was used. First, an augmented neo-classical production function was developed to link the employment of capital and labour services to industrial, and introduce additional variables based on literature to capture the effect of structural factors and the entire macro-economic and the external environment. Second, the time series properties of data used in the regression where examined to eliminate any case of spurious regression (Granger and Newbold, 1974); Engle and Granger (1987). Granger and Newbold (1974) have shown that ordinary lease square estimates of parameters for non-stationary series in regressions do not converge to constant and that the usual t and F-test statistics do not have limiting distribution. Hence, their use in that case generates furious influence. The technique adopted involved the augmented Dickey Fuller (ADF) test for unit root. The ADF unit root test statistics was estimated in respect of each of the variables in the model in the equation.

Third, the Engle-Granger two step cointegration tests used to test for cointegrating relationship among the variables. This test involves two steps. In the first step, the model is specified and estimated in level. This will amount to spurious regression, if the variables are non-stationary. The residual, so obtained is found to be a stationary series through the augmented Dickey-Fuller unit root test, a conclusion is reached that cointegration relationship exists among the variables.

After the co integration test, dynamic over parameterized model and the parsimonious counterpart are estimated. Based on the various test statistics, namely, Akaike Information Criterion, standard error of regression, Schwarz information Criterion and the F-statistics among others, the over parameterized model is reduced to parsimonious dynamic model that permits fundamental policy implications to be drawn.

**Empirical Results**

Order of integration and unit root test

For the purpose of examining the order of integration of each series, the augmented Dickey-Fuller method was used. The augmented Dickey-Fuller (ADF) method is a test on the size of the coefficient a in the equation:

$$\Delta Y_t = \underline{\beta_0} + \underline{\beta_1} t + a\, Y_{t-1} + \Sigma\lambda_i\, \Delta_{yt-1} + \varepsilon_t \quad \text{---------- (4)}$$

Normally this would be carried out using a traditional "t" test against the null.

$H_0 : \alpha = 0$ against $H_1 : \alpha < 0$. i is lag length which is usually set so as to ensure that any autocorrelation in $\Delta Y_t$is absorbed and the error is distributed as white noise. In this study, setting i at 2, all residual autocorrelation is capture. Table 2reports the results of the augmented Dickey-Fuller tests statistics for the order of integration of each series.

With the exception of the inflation rate which clearly is integrated of order zero, these results can be interpreted as indicating AGGEXP, CU, INDU, NETFDI, OPNSS, PSENROL, and RGDP are indeed integrated of one data set (that is, I (1) ) or non-stationary. The immediate implication flowing from this data set is that any dynamic specification of the model in the levels of the series is likely to be inappropriate and may be plagued by problems of spurious regression. However, an error-correction model can be derived if the series of the model are co-integrated.

**Test for Co-integration**

In testing for co integration the Augmented Dickey Fuller test is again invoked although in case it is applied to the residuals of the residuals of the co integrating long-run regression rather than

the levels of the series. Following Engle and Granger (11987), the co-integrating relationship is specified as:

$$Y_t = \alpha_0 + \alpha_1 Z_t + \varepsilon_t \quad \text{---------- (5)}$$

Where Z is a vector of the explanatory variables and Y is the dependent variable, respectively. The residuals of the equation, $\varepsilon_t = (Y_t - \alpha_0 - \alpha_1 Z_t)$ is simply the linear difference of the non-stationary series. If the residuals from the linear combination of non-stationary series are themselves stationary then it could be accepted the non-stationary series are co-integrated. In the case of tests for co integration the critical values for the tests differ according to the number of variables, n, relevant in the co integrating regression. The relevant critical values are reported in Tables 3 and 4. The results presented indicate that the residual from regression is itself stationary. Applying the Granger-Engle representation theorem, the next step requires the specification of a dynamic error correction model of the form:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta Z_t + \alpha_2 (Y\text{-}Z)_{t-1} + \varepsilon_t \quad \text{---------- (6)}$$

Where Y-Z represents the error correction term.

**Dynamic Error Correction Model**

Having established the extent and form of co integrating relationship between the variables of the model, the Engle-Granger theorem suggests the estimation of an over-parameterizederror correction model. Though the Engle-Granger theorem establishes the encompassing power of the error correction model other forms of dynamic specifications when co integration exists it does not reveal any information about the nature of the dynamic process around the embedded long-run solution. Consequently, the initial specification of the error correction model should set the lag length on all variables to as long as the data permits. The aim of the over parameterized model is to assist in the identification of the main dynamic patterns in the model and to ensure that the dynamics of the model have not been constrained by a too short lag length. Table 5 presents the over parameterized model. To be able to able to interpret the model and derive useful policy implications, a more parsimonious representation of the data is required. Here parsimony is defined as the maximization of the goodness of fit of the model with the minimum number of variables. The Akaike information criterion and Schwarz criterion provided a guide to parsimonious reductions. The resulting parsimonious model is presented in table 6.

The results in table 6 allow for a clearer interpretation of the dynamic process. Note that there has been a tremendous improvement in the coefficient of determination. This is an indication of improvement in goodness of fit. Other measure of parsimony, such as the standard error of regression, F-statistic and Schwarz criterion have all improved, though Akaike has not. The first feature to notice in the parsimonious model is the well-defined error correction term, ECM, which indicates a feedback of approximately 50 percent of the previous year's disequilibrium from the long run industrial production. The strong significance of the coefficient on EFM supports the earlier conclusion that terms capturing trade liberation were significant. Contrary to expectation, foreign direct investment did not enter the parsimonious model. Hence, the much talked about foreign investment leading to industrialization may not be the case for Nigerian industrialization. One may attempt to offer an explanation for this. The nature and structure of foreign direct investment flow into the country might be the possible culprit. Net foreign direct investment into the manufacturing and industrial sector is nothing comparedto foreign direct investment in the extractive industries like crude petroleum extraction.

Third, it should be noted that apart from trade liberalization, whose effect lasts beyond the current period, the effects of other variable take place within the current period. Inflation has a sharply negative effect on industrial production. Similarly, public expenditure in current period have a negative, but mild effects on industrial production. These imply that for government to achieve or realize its dream of fast industrial development, macroeconomic environment stability must be restored. In addition, the scaring size of the public enterprise must be reduced. The privatization exercise must be encouraged to continue in order to reduce the size of government expenditure which is already exerting negative effect on industrial production.

Finally, it must be noted that out of two terms capturing structural factors: capacity utilization and electricity generation, it must be cautioned at this juncture, that though the electricity generation was found to be significant in this study, power failure electricity blackouts have tremendous damaging effects on industrial production and development of the industrial sector. It was not possible to differentiate between electricity generation, which itself is part of the industrial output, and actual power failure/black out. It is not usually what is generated that is efficiently distributed to the final consumer of electricity.

**Discussion of the Policy Implications of the Findings**

The development of an economy revolves on the evolution of its industrial sector and its position for competitiveness in the global economy. In this regard, underutilization of existing industrial capacities is of major concern to the national economy. This study is a manifestation of the obvious fact that capacity utilization has a significant influence on the output of industrial sector of Nigeria. High cost of production occasioned by wrong macroeconomic policy environment and other structural factors has been the bane of industrial development in Nigeria. Unstable macroeconomic environment increases the risk on industrial investment and leads to firms operating below full capacity. A lot of factors have led to capacity underutilization in the Nigerian industrial sector. These include shortage of raw materials, utility and energy failures, inadequate market and low demand. There is, of course, actual physical deterioration where machines have become obsolete and cannot be put to use. This impairs the efficiency of industrial production. Eliminating hindrances to trade can encourage foreign investors to invest in the industrial sector of the economy and enables existing firms to obtain foreign inputs at lower cost. Other implications flowing from the study include, the need to stimulate human capital formation in the country. The quantity of industrial capital in the country is still negligible. The high elasticity of industrial human capital means that the country stands to gain a lot from investment in human capital.

**Summaries of Findings**

The analysis shows that industrial sector development is influenced by a number of factors, namely structural, external and macroeconomic. In particular, the following results were obtained.

1. It was established that Nigeria's industrial production is largely influenced by the trade policy of the country. A liberal trade policy would permit the acquisition of necessary inputs at low cost from foreign countries and attract foreign investors to the industrial sector of the economy.
2. It is clear that Nigeria's industrial sector uses relatively more capital intensive methods of production than would appear appropriate, hence primary school enrolment rate, a proxy for human capital formation was insignificant in the determination of industrial development in Nigeria.

3. It is also obvious from the analysis that unstable macroeconomic policy environment is inimical to industrial development. Inflation rate, a proxy for stability, adversely affected industrial production in the analysis that was conducted.

4. It was discovered that foreign direct investment does not have much impact on industrial production. The much touted spillover effects of foreign direct investment seems to be negligible in the context of the Nigerian industrial sector.

5. It was found that industrial capacity utilization can play a very significant role in increasing the rate of industrial production. Hence, to boost industrial production and achieve industrial development, there is need to boost capacity utilization. Factors responsible for underutilization of capacity, such as power failure and obsolete equipment, should be addressed as a matter of urgency.

6. The size of the public sector expenditure has an adverse influence on industrial development.

**Policy Recommendation**

In view of these findings, policy in the short run focused at raising industrial production and ensuring industrial development should include the following policies:

The current industrial outlook should be transformed. Currently, most manufacturing production involves an exclusive reliance on the domestic market as the source of demand for their products. Hence, poor quality products which cannot be competitive in the global market are produced. This is made possible by the use of a system of industrial incentives, which include high protective tariffs, tax subsidies, etc. there should be a market based free enterprise system with investor friendly policies that will create an enabling environment for foreign investors to come and at the same time permit local investors to market their products in the global market.

Government should embark on programmes to eliminate constraints to capacity utilization in the industrial sector. In this regard, the power sector reform is much welcome. Trade policy reform should aim at enhancing access to important raw materials and industrial inputs.

The government should also invest massively in research and development to discover alternative methods of production that will make use of the abundant human and material resources available in the country. Over-capitalization of production processes might not be beneficial to the country given its enormous wealth of human resources. Industrial research should aim at discovering substitute raw materials which were not known before and so reducing the import-dependence of our industries.

Government will have to increase the financial and manpower resources devoted to industrial research. Investment in human capital development should be a matter of priority to the government. Proper funding of the educational system and educational reform to make education more productive is required.

Excessive government consumption should be discouraged. The privatization exercise should be efficiently implemented to reduce the size of the government sector which has been found in this study to be inimical to industrial development.

**Conclusion**

Conceptually and from theoretical assessments as highlighted in this study, industrialization promotes economic growth and development. It holds a major key to the emancipation of developing

countries from technological servitude. Indeed, it is taken as an index of development in many quarters. Empirical evidence from this study has shown that the presence of some structural bottlenecks may hinder industrial growth and development of Nigeria. Upon this background, Nigeria should direct efforts towards improving on the factors that can eliminate these structural bottlenecks. Among such efforts include energy sector reform, educational reform, trade policy reform and general macroeconomic policy reforms to increase capacity utilization in the industrial sector.

**Implications for Education**

For a progressive approach to these issues, the educational implications have to be noted industrialization in Nigeria is hinged on structural economic factors. This view need to be emphasized in the curriculum content of economics education for a progressive and efficient result within the economy. Trade liberalization and openness angur well for an economic development. Through economics education and economics literature, the public has to be enlightened and made aware of the benefits to be derived from such economic posture. Policy makes have to be versed in economic education and view the needs of the populace before embarking on the implementation of trade police.

A progressive economics education is also a tonic to the developmental effort of the nation as it assists in making the people understand the role they can play in the industrial process and make profit yielding investment decisions.

**Table 1: Manufacturing and Industrial Production Index, Capacity Utilization and Inflation Rates (1970-2015)**

| Year | Manufacturing | Industry | Capacity utilization | Inflation rates |
|---|---|---|---|---|
| **1970** | 24.1 | 41.3 | 85.2 | 13.9 |
| **1971** | 27.3 | 54.8 | 13.28 | 16.0 |
| **1972** | 29.7 | 62.3 | 81.9 | 3.4 |
| **1973** | 336.6 | 72.4 | 80.2 | 4.6 |
| **1974** | 35.5 | 76.2 | 78.6 | 13.5 |
| **1975** | 43.9 | 71.8 | 76.6 | 33.9 |
| **1976** | 54.1 | 85.5 | 77.4 | 21.1 |
| **1977** | 57.5 | 88.6 | 78.7 | 21.5 |
| **1978** | 65.8 | 90.4 | 72.1 | 13.3 |
| **1979** | 97.3 | 120.3 | 71.5 | 11.6 |
| **1980** | 102.4 | 119.0 | 70.1 | 10.0 |
| **1981** | 117.4 | 115.6 | 73.3 | 21.4 |
| **1982** | 132.8 | 122.9 | 63.6 | 7.2 |
| **1983** | 94.8 | 96.4 | 49.7 | 23.2 |
| **1984** | 83.4 | 91.6 | 43 | 40.7 |
| **1985** | 100 | 100 | 38.8 | 4.7 |
| **1986** | 96.1 | 103.5 | 38.3 | 56.0 |
| **1987** | 128.4 | 122.1 | 40.4 | 10.2 |
| **1988** | 135.2 | 108.8 | 42.4 | 56.0 |
| **1989** | 154.3 | 125.0 | 43.8 | 50.5 |
| **1990** | 102.9 | 130.6 | 40.3 | 7.5 |
| **1991** | 178.1 | 138.8 | 42 | 12.9 |
| **1992** | 169.5 | 136.2 | 38.1 | 44.5 |
| **1993** | 145.5 | 131.7 | 37.2 | 57.3 |

| | | | | |
|---|---|---|---|---|
| **1994** | 144.2 | 129.2 | 30.4 | 57.0 |
| **1995** | 136.2 | 128.8 | 29.3 | 73.1 |
| **1996** | 138.7 | 132.5 | 32.5 | 29.1 |
| **1997** | 138.5 | 140.6 | 30.4 | 8.5 |
| **1998** | 133.1 | 133.5 | 32.4 | 10.0 |
| **1999** | 137.7 | 129.1 | 34.6 | 6.6 |
| **2000** | 138.2 | 138.9 | 36.1 | 6.9 |
| **2001** | 142.2 | 144.1 | 42.7 | 18.9 |
| **2002** | 146.3 | 145.2 | 44.3 | 12.9 |
| **2003** | 147.1 | 145.5 | 46.1 | 11.3 |
| **2004** | 145.2 | 144.9 | 44.3 | 14.3 |
| **2005** | 146.2 | 145.2 | 44.9 | 12.8 |
| **2006** | 146.16 | 145.2 | 45.1 | 12.8 |
| **2007** | 145.8 | 145.1 | 44.7 | 13.3 |
| **2008** | 146.0 | 145.16 | 44.9 | 12.9 |
| **2009** | 145.9 | 145.15 | 44.9 | 13.0 |
| **2010** | 145.9 | 145.13 | 44.8 | 13.06 |
| **2011** | 145.6 | 145.14 | 44.86 | 12.9 |
| **2012** | 145.8 | 145.14 | 44.85 | 12.98 |
| **2013** | 145.7 | 145.13 | 44.83 | 12.98 |
| **2014** | 145.7 | 145.14 | 44.84 | 12.95 |
| **2015** | 145.73 | 145.13 | 44.84 | 12.97 |

Economics education ought to be made compulsory in the secondary school system to enable every scholar get the rudiments of economics as to function in his vocation as an economic man; taking decisions that reflect on understanding of economic systems.

All in all, a progressive economic education is a prerequisite for the internationalization of economic education in Nigeria. The economic system of Nigeria needs to be understood by both the nationals and foreigners who may need to make investment, seeking opportunities and utilizing them are very much tied to the success of any enterprise. More efforts should be made by Nigeria as the situation is through information is through information dissemination anchored on a progressive economic education on the values of establishing manufacturing firm, especially improving small-scale industries where its comparative advantage seems higher so as to benefit from the internationalization of economics education in Nigeria.

**Table 2: Augment Dickey Fuller Unit Root Test for Order of Integration**

| **Variable** | **ADF statistics** | | **50% critical value** | | **Remark** |
|---|---|---|---|---|---|
| | Level | 1st difference | Level | 1st difference | Decision |
| AGGEXP | -0.9697 | -4.966497 | -2.9558 | -2.9691 | 1(1) |
| CU | -1.7104 | -7.314847 | -2.9558 | -2.9591 | 1(1) |
| ELEC | 1.7104 | 1.383733 | -2.9558 | -2.9591 | 1(2) |
| INDU | -2.01435 | -4.231044 | -2.9558 | -29591 | 1(1) |
| NETFDI | -2.34299 | -7.49221 | -2.9558 | -29591 | 1(1) |
| OPNSS | -2.09804 | -5.72158 | -2.9588 | -2.9591 | 1(1) |
| PSENROL | 0.87108 | -3.524487 | -2.9558 | -2.9591 | 1(1) |
| RGDP | 0.991968 | -3.299927 | -2.9558 | -29591 | 1(1) |
| INFL | -3.43943 | -5.68714 | -2.9558 | -2.9591 | 1(0) |

**Table 3: Long Runcointegrating Relationship (Dependent Variable INDU)**

| Variable | Coefficient | t-statistics | p-value |
|---|---|---|---|
| **C** | 25.58695 | 2.140687 | 0.0422 |
| **ELEC** | 0.005281 | 1.847236 | 0.0766 |
| **CU** | -0.012186 | -0.099462 | 0.9216 |
| **AGGEXP** | -5.30E-05 | -3.994787 | 0.0005 |
| **NETFDI** | -0.000261 | -1.079224 | 0.2908 |
| **INF** | 0.037213 | 0.271188 | 0.7885 |
| **PSENROL** | 4.774974 | 8.161540 | 0.0000 |
| **RGDP** | -6.76E-05 | -2.399246 | 0.0242 |
| **OPNSS** | 0.399495 | 3.956196 | 0.0006 |
| **R-squared** | 0.907418 | | |
| **Adjusted R-squared** | 0.877792 | | |
| **S.E. of regression** | 9.977364 | | |
| **Durbin-Watson stat** | 1.504341 | | |
| **F-statistic** | 30.62899 | | |

**Table 4: ADF Test on Residuals of the Cointegrating Relationship**

| Variable at level | ADF test statistics | 5% critical value | Decision |
|---|---|---|---|
| **ECM 1** | -3.850361 | -2.9558 | 1(0) |

**Table 5: Over Parameterized Error-Correction Model**

| Variable | Coefficient | T-statistics | P-value |
|---|---|---|---|
| **C** | 14.49490 | 1.737685 | 0.1807 |
| **D(ELEC)** | -0.006073 | -0.133009 | 0.9026 |
| **D(ELEC(-1))** | -0.101610 | -1.812879 | 0.1675 |
| **D(ELEC(-2))** | -0.042772 | -1.812879 | 0.1675 |
| **D(CU)** | 1.116649 | 1.110626 | 0.3477 |
| **D(CU(-1))** | -0.124052 | -0.308780 | 0.7777 |
| **D(CU(-2))** | -0.058129 | -0.198385 | 0.8554 |
| **D(AGGEXP)** | -6.17E-05 | -0.751167 | 0.5071 |
| **D(AGGEXP(-1))** | 3.53E-05 | 0.328599 | 0.7641 |
| **D(AGGEXP(-2))** | -0.000242 | -0.581495 | 0.6017 |
| **D(NETFDI)** | 0.000804 | 1.384250 | 0.2603 |
| **D(NETFDI(-1))** | 0.000826 | 1.699115 | 0.1879 |

| | | | |
|---|---|---|---|
| **D(NETFDI(-2))** | 0.000535 | 1.373715 | 0.2632 |
| **D(INF)** | -0.679417 | -2.589483 | 0.0811 |
| **D(INF(-1))** | -0.177381 | -0.804022 | 0.0811 |
| **D(INF(-2))** | -0.223162 | -0.646321 | 0.5641 |
| **D(PSENROL)** | 1.411666 | 0.252087 | 0.8173 |
| **D(PSENROL(-1))** | -1.761559 | -0.348025 | 0.7508 |
| **D(PSENROL(-2))** | 0.659288 | 0.147250 | 0.8923 |
| **D(RGDP)** | 0.000332 | 0.496503 | 0.6536 |
| **D(RGDP(-1))** | -0.000289 | -1.051790 | 0.3701 |
| **D(RGDP(-2))** | -4.35E-05 | -0.117405 | 0.9140 |
| **D(OPNSS)** | 0.299179 | 1.234756 | 0.3048 |
| D(OPNSS(-1)) | -0.176934 | -0.388116 | 0.7238 |
| D(OPNSS(-2)) | 0.148988 | 0.857656 | 0.4541 |
| ECMI(-1) | -0.288320 | -0.298242 | 0.4541 |
| D(INDU(-1)) | 0.096049 | 0.145593 | 0.8935 |
| D(INDU(-2)) | 0.569643 | 1.116810 | 0.3455 |
| R-squared | 0.931432 | Mean dependent var | 2.683871 |
| Adjusted R- squared | 0.314323 | S.D dependent var | 10.12005 |
| S.E of regression | 8.379969 | Akaike info Criterion | 6.560642 |
| Sum squared resid | 210.6716 | Schwarz criterion | 7.855856 |
| Log likelihood | -73.68995 | f-statistic | 1.509348 |
| Durbin-Watson stat | 2.506507 | Prob(F-statistic) | 0.417703 |

**Table 6: Parsimonious Dynamic Error Correction Model (Dependent Variable INDU)**

| Variable | Coefficient | T-statistics | P-value |
|---|---|---|---|
| **C** | 4.444390 | 3.388661 | 0.0024 |
| **D(CU)** | 0.839666 | 2.763585 | 0.0108 |
| **D(AGGEXP)** | -3.43E-05 | -2.932788 | 0.0016 |
| **D(INF)** | -0.277344 | -3.485687 | 0.0019 |
| **D(OPNSS(-2))** | 0.155586 | 2.540813 | 0.0179 |
| **ECMI(-1)** | -0.487688 | -2.941839 | 0.0071 |
| **R-squared** | 0.626823 | Mean dependent var | 2.683871 |
| **Adjusted R squared** | 0.533528 | S.D dependent var | 10.12005 |
| **s.E. of regression** | 6.911866 | Akaike info criterion | 6.900036 |
| **Sum squared resid** | 1146.573 | Schwarz criterion | 7.223839 |
| **Log likelihood** | -99.95056 | F-statistic | 6.718762 |
| **Durbin-Watson stat** | 1.821985 | Prob(F-statistic) | 0.000286 |

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