

Topic: Appraisal of the Impact of Industrialization on Economic Growth in Nigeria

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Abstract:- *This study examined the impact of industrialization on economic growth in Nigeria for the period spanning from 1981 to 2015. Secondary data was used and sourced from the Central Bank of Nigeria's statistical bulletin and was analyzed through the employment of Augmented Dickey Fuller, Kwiatkowski-Phillips-Schmidt-Shinto, Zivot-Andrews mechanism to ascertain the stationarity of the variables and ARDL Technique was adopted for the regression analysis. The results of the unit root suggested that the variables had mixed degree of integration, while the result from the ARDL regression showed a positive and significant impact between industrial output and gross domestic product. The ECM result revealed that the disequilibrium that occurred due to shocks was totally corrected in the sixteenth quarter at about 6 per cent per quarter. The ARDL bound test revealed that the study variables were co integrated in the long run. It was thus recommended that government should revive the key industries (e.g. textile and steel industries) in the nation that have been abandoned for long and also a proper allocation and management of existing industries so as to ensure proper and positive linkage effects on the economy.*

Keywords: *Industrial Output, Foreign Direct Investment, Lending Rate and Output Growth*

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I. Introduction

Industrialization is said to be the process of building up a nation's capacity to convert raw materials and other inputs to finished goods for other production or for final consumption (Anyanwu, Oyefusi, Oaikhenan, and Dimowo 1997). Industrialization is the backbone of a country's economic growth and development. It brings about an increased volume and varieties of manufactured goods resulting in increased employment and improved standard of living of the citizens. Industrialization is also regarded as a veritable channel of attaining the lofty and desirable national goals and quality of life for the citizenry (Adeoye 2005). It forms the central object of economic policy in most developing economies and is seen as a crucial and powerful integral part of overall development and structural process of an economy (Uniamikogpo 1996). Attaining and sustaining full industrialization is therefore the goal and aspiration of every sovereign nation or economy.

Thus, history recorded that the industrial sector performance in Nigeria's economic growth is as old as the nation itself. It dates back to the amalgamation of the southern and northern parts of the country in 1914 to form the geographical land mass called Nigeria. In Nigeria as in many other developing countries, industries are attached to manufacturing as is considered the most dynamic component of industrial sector and a strong and thriving manufacturing sector usually precipitates industrialization. The manufacturing sector is widely considered to be the ideal industry to drive Africa's development. This is due to the labor-intensive, export-focused nature of the industry. There is a direct correlation between exportation levels and the economic success of a country. By increasingly adding value to products before they are sold, revenues are boosted, thereby raising average earnings per input (Bigsten, Gebreeyesus and Söderbom 2008).

Therefore, in recognition of this, successive governments in Nigeria have continued to articulate policy measures and programme to achieve industrial growth and development. This cannot be attained until manufacturing capacity is utilized to a reasonable extent. Industrialization has come to be regarded as a crucial and powerful engine in the overall development process.

The growth of the Nigerian economy has not been stable over the years as the country's economy has witnessed so many shocks and disturbances both internally and externally over the decades. Internally, the unstable investment and consumption patterns as well as the improper implementation of public policies, changes in future expectations and the accelerator are some factors responsible for the instability. Similarly, some of the external factors identified include wars, revolutions, population growth rates and migration, technological transfer and changes as well as the openness of the country's economy. The cyclical fluctuations in the country's economic activities has led to the periodical increase in the country's unemployment and inflation rates as well as the external sector disequilibria (Gbosi 2001).

While desiring to use industrialization to tackle economic growth problems, many nations have neglected the need to establish industries that are necessary towards absorbing the abundant labour resource and other local inputs for breaking the vicious circle of poverty among the larger percentage of the citizenry and in achieving dynamic and self-reliant economies (Iwuagwu 2011). Hence a slow pace of industrialization in Nigeria in the last three decades have been recorded despite much effort put in place by successive administration to bring about revolution in the sector via various policies and programmes. This situation calls for an urgent concern because this is the time when the country is aspiring to be ranked among the top 20 economies in the world by the year 20-20.

Although, there a lot of studies conducted to assess the impact of industrialization on economic growth such as Ndiyo and Obinyisi (2003), Isiksal and Chimezie (2016), Sharma, Varlish and Nishue (2008), Ogunnirola and Nishu (2010), Okafor (2008), Eze and Okpala (2011). However, most of these studies rely on the use of ADF to ascertain the stationarity properties of the time series data in which to some extent has been empirically conducted that useful results cannot be obtained on non-stationarity time series using OLS as a technique of analysis. Furthermore, in most of their studies they have a maximum scope of 15-25 year. It is against this background that this study is different from the previous studies and attempts to fill in the existing gap.

1.3 Objectives of the Study

The main objective of the study is to appraise the impact of industrialization on output growth in Nigeria.

Specific objectives are:

- (i) Examine the contributions of the industrial output to gross domestic product in the Nigerian economy
- (ii) Assess the impact of foreign direct investment on economic growth
- (iii) Examine the long run relationship between industrial indices (industrial output, maximum lending rate & foreign direct investment) and gross domestic product in Nigeria.

1.4 Hypotheses of the Study

The following null hypotheses are to be verified in this study:

- (i) Industrial output does not contribute to gross domestic product in Nigeria.
- (ii) Foreign Direct Investment has no significant impact on gross domestic product in Nigeria.
- (iii) There is no long run relationship between the industrial indices (FDI, MLR & IND) and gross domestic product in Nigeria.

1.5 Limitation of the Study

The study is limited to the contributions of the industrial indices towards the growth of the Nigerian economy for a period of 1981-2015

2.2 Conceptual Issues

2.2.1 Industrialization

The industrial sector is known to be the strength of the value-added processed in many economies. Governments especially in developing countries, see industrialization as a weapon for increasing national output to minimize dependence on developed countries and minimize fluctuation in foreign exchange earnings (Ayodele and Falokun 2003). Industrialization has assumed super importance for accelerating economic development in both the developed and the developing nations. It reduces unemployment and poverty and is considered a pathway to prosperity. Industrialization is about the introduction and expansion of industries in a particular place, region or country (Obioma and Ozughalu 2005). It is a situation where many industries are established in different parts of the country. As many industries are established in a country different types of products are produced as well. Industrialization therefore, is a process of building up a country's capacity to produce varieties of products – extraction of raw materials and manufacturing of semi-finished and finished goods. Anyanwue *et al* (1997) describes industrialization as the process of building up a nation's capacity to convert raw materials and other inputs to finished goods and to manufacture goods for other production or for final consumption. Industrialization enhances the utilization of productive inputs (labour, capital and raw materials), given the country's technology, to produce non-durable and durable consumer goods, intermediate goods and capital goods for domestic consumption, export or further production. Thus industrialization could be described as the process of transforming raw materials, with the aid of human resources and capital goods into (a) consumers' goods, (b) new capital goods which allows more consumers goods (including food) to be produced with the same human resources, and (c) social overhead capital, which together with human resources provides new services to both individuals and business (Ekpo 2009).

2.2.2 Industrial policy

A country's industrial policy is the dynamic tool for stimulating and regulating its industrial development process. It is a blueprint detailing the objectives and strategies for optimally attaining the goals of non-primary production, particularly manufacturing, taking into consideration the resource endowment of the country in terms of labour, land, capital, entrepreneurship, international goodwill etc (Federal Ministry of Industry & Technology, 1992). The existing literature defines industrial policy in different ways, emphasizing various aspects of State intervention in support of industrialization. Reich (1982), who was a great defender of industrial policy in the United States, defined industrial policy as the set of governmental actions designed to support industries that have major export potential and job-creation capacity, as well as the potential to directly support the production of infrastructure.

Pack (2000) looks at industrial policy as actions designed to target specific sectors to increase their productivity and their relative importance within the manufacturing sector. In the same vein, Amsden (1989), Chang (2002), Lin and Chang (2009) defined industrial policy as a guide to government intervention to selectively promote certain manufacturing sectors with the aim of encouraging a country to defy its comparative advantage and develop its manufacturing sector. Johnson (1984) defines industrial policy in a narrow sense, as those "government activities that aim to support the development of certain industries in a national economy to maintain international competitiveness". Chang (1994) describes industrial policies as governmental actions supporting the generation of production and technological capacity in industries considered strategic for national development. Landesmann (1992) makes an original contribution to the definition by underlining the selective component of industrial policy. The main criticism against industrial policy arises from the concept of government failure. Industrial policy is seen as harmful as governments lack the required information, capabilities and incentives to successfully determine whether the benefits of promoting certain sectors above others exceeds the costs and in turn implement the policies. The East Asian Tigers provided successful examples of heterodox interventions and protectionist industrial policies (Amsden 1992). Industrial policies such as Import-Substitution-Industrialization (ISI) have failed in many other regions such as Latin American and Sub-Saharan Africa. Governments in making decisions with regard to electoral or personal incentives can be captured by vested interests, leading to industrial policy that would only support rent-seeking, while distorting the efficient allocation of resources by market forces at the same time (Pack and Saggi 2006).

Scholars such as Anne-Kruger (1993) and Deepak (1983) argued that industrial policy had not worked and indeed could not work because government failures were always worse than market failures. This argument was certainly correct in pointing to some very unsuccessful instances of industrial policy in developing countries. However, it was rather selective in its focus. Moreover, the theoretical argument that government failures are always worse than market failures seems more ideological than based on either theory or evidence. Different regions have adopted different type of industrial policy and incentives with mixed outcomes. In Latin America and some Sub-Saharan African countries, for example, it came in the form of Import Substituting Industrialization (ISI) with the closure of domestic markets to international competition. In South Korea and Taiwan, the model was export based with incentives created to induce the development of export industries (the domestic market was also protected). The explanation for the adoption and success of different industrial policies may be due to the differences in the ideas and the ideologies of the different policy makers or their economists.

2.2.3 Industrialization and economic growth

Industrialization may refer to an increase in the share of manufacturing in the Gross Domestic Product (GDP), and in the occupations of the economically active population. It could also be used to describe the development of economic activity in relatively large units of production, making much use of machinery and other capital assets, with the tasks of labour finely divided and the relationships of employment formalized (Kirk-Greene 1981). In either case, industrialization is concerned with the expansion of a country's manufacturing activities, including the generation of electricity and the growth of its communications network. It is also a process of reducing the relative importance of extractive industries and of increasing that of secondary and the tertiary sectors (Adejugebe 2004).

There is evidence to suggest that industrialization and in particular manufacturing is the prime mover of economic growth. This is given that it creates employment, enables wealth creation and facilitates poverty alleviation. Former United Nations Secretary General, Kofi Anan in his message to Africa's Industrialization Day (2003), highlighted the relevance of industrialization, especially its varied and valuable contribution to the alleviation of poverty. Industrialization, he argued, raises productivity, creates employment, reduces exposure to risk, enhances income-generating assets of the poor and helps to diversify exports. It is in fact argued, that the transformation of Southeast Asia within a few years and the unprecedented pace of development of China and India. (Which has lifted millions from poverty), are examples of what sustained industrialization could do to any economy.

There is an intrinsic relationship between industrialization and economic growth. This is given that there is hardly any country that has developed without industrializing even as rapidly growing economies tend to have rapidly growing manufacturing sectors (UNIDO 2009). Similarly, virtually every country that experienced rapid growth of productivity and living standards over the last two hundred years has done so by industrializing (Murphy 1989). England, which is widely acclaimed as the first developed country, achieved this status using the Industrial Revolution, which enabled it, thanks to series of cost-reducing innovations, to increase its industrial output fourfold beginning from the first half of the eighteenth century. Since then, the main criterion for growth has been an increase in per capita income resulting mainly from industrialization. The example of Southeast Asia, which we earlier alluded to, is self-evident. In these economies industrialization has proved to be the natural route to growth in an economy. Their spectacular rise, contrasts sharply with the continued industrial marginalization of sub-Saharan Africa as well as other least developed economies.

2.2.5 Government incentives/policy measures to the industrial sector

Government has since independence in 1968 made conscious effort to reduce dependence on foreign manufacturers through supportive program aimed at making the local manufacturers meet local demand along the line of import substitution. In order to achieve the above objective, the Nigerian government has drafted for the country an industrial policy document to guide its achievement. According to the Bureau of Public Enterprise (2005), Industrial policy can be defined as a systematic government involvement through specifically designed policies in industrial affairs, arising from the adequacy of macroeconomic policies in regulating the growth of the industry. It went further to say that the instrument of industrial policy includes; subsidies, tax incentives, export promotion, government procurement and import restrictions. Others include direct investment which formed the pivot of industrial policy from 1970s to 1980s. Foreign exchange rate policy, monetary policy and trade policy also help to shape investment decision.

The industrial policies of Nigeria intend to achieve the following objectives.

- i. To generate and raise the production.
- ii. Increase export of locally manufactured goods.
- iii. Create a wider geographical dispersal of industries.
- iv. To improve the technological skill and capabilities available in the country.
- v. To increase local contest of industrial output by looking inwards for the basic and intermediate input.
- vi. To affect foreign direct investment.

To achieve the above, the Nigerian government has put in place some policy measures or policies, these policy measures are looked at from three perspectives. Funding industrial development, incentives to industry and institutional frame work.

A. Funding Industrial Development

Improving industrial production in Nigeria requires high financial resources. The private sector is expected to play the leading role while the government focuses on the facilitators' role. To help the industrialist to obtain a cheap inventible fund, government adopted two major strategies.

- a. The provision of credit facilities on concessionary economic development banks.
- b. Provision of equity funds and long term loans by the banking sector for the promotion of small and medium enterprises.

Based on the above, government has allocated substantial resources for funding industrial growth through the Bank of Industry (BOI). The bank was created from the merge of National Economic Reconstruction Fund (NERFUND). The bank is expected to facilitate the production of primary industrial inputs by providing medium and long term loan for Agriculture and agro-allied industries. The banks emerge from the merge of people bank, Nigerian Agricultural and Corporation Bank and Family Economic Advancement Programme (FEAP). To make funds available to small and medium scale enterprises (SMES) which help Nigeria government to achieve its objectives of self-reliance enhances poverty reduction etc. Government through the Central Bank has encouraged banks to set aside 10% of their annual profit as equity funds and long term loans for the promotion of SMES. To attract foreign capital, the government has put in place structures that will encourage capital inflow to the economy. These measures include deregulation of the economic policy stability, reduction in number of regulatory agencies and establishing the Nigeria investment promotion commission (NIPC). It also embarked on port reforms and establishment of Export processing factories and improving the infrastructural facilities in the country.

B. Incentives to Industry

To achieve the industrial development of the nation and promote a dynamic efficient and sustainable manufacturing sector government has set up a package of incentives. The incentives geared towards encouraging the private sector to play a leading role, promote geographical dispersal of industries and increase

industrial output and domestic resources utilization and industrial linkages. The incentives are divided into (i) fiscal measure and (ii) export promotion.

Fiscal Measures

- i. **Tax Holiday:** This is exemption of some industries especially the infant ones from the payment of tax for the period of at least 5 years to enable them grow.
- ii. **Tariff Protection:** This is imposition of a heavy import duty on foreign goods so as to protect local industries from international competition.
- iii. **Import Duty Relief:** This is the granting of import duty relief to the importation of capital equipment by the government. This helps the newly established firm to be able to procure capital equipment cheaply, thereby increasing their productivity.
- iv. **Reduction of Excise Duty:** This simply means reduction in the amount paid as taxes for goods and services produced in the country. This helps to reduce business cost of production.

Export Promotion

Export incentives came on board in the 1980s with the introduction of Structural Adjustment programme (SAP) through the promulgation of the export decree No.17 of 1986. It includes:

- i. **Export Development Fund:** The government set up this scheme to assist financially the private sector exporting companies to cover part of their export promotion activities. These include training, seminars, advertising and publicity export research etc.
- ii. **Export Expansion Grant:** The scheme provided inducement to exporters who have exported ₦500, 00. Worth of processed product its 20% grant on the total annual export and on receipt of confirmation of repatriation of export proceeds. It is administered by the Nigeria Export Promotion Council. Other policy measures includes; duty draw scheme, depreciation allowance, currency retention scheme etc

C. Institutional Framework

The institutions play advisory facilitators roles in the industrialization process of the country. They make the business environment conducive for successful take off. The institution includes individual training fund (ITF) for man power development, standard organization and quality for products, National Automotive Council (NAC) to execute the automotive policy of government. Others include; Central Bank of Nigeria (CBN), Industrial Data Bank (IDB), Industrial Inspectorate Department, Small and Medium Industries Development Agency (SMIDA), Raw Material Research and Development Council (RMRDC), National Agency for Food Drug Administration & Control (NAFDAC) etc.

2.3 Theoretical Framework

2.4.1 Gerschenkron theory

According to Gerschenkron, all nations were once backward hence to move from the traditional level of economic backwardness to modern industrial economy requires a sharp break with the past or a “great spurt” of industrialization. Many Western countries like the United States, Germany, Great Britain and France experienced Changes at roughly the same time and achieved partly industrialization during the first half of the 19th Century”. Thus he noted that the advanced nations started their first stage of development with the factory/private firm. While (the great spurt) will be provided by banks in what he described as moderately backward states and government in extreme backward states.

There are several tensions between economic backwardness and the urgency of development in many directions. According to Gerschenkron, for industrialization, as put forth by Rostow, he based his view on two empirical observations first, the preconditions for industrialization that existed in England were either absent in the backward countries of Europe or existed in a very small scale – second, a big spurt of industrialization occurred even in those countries where such preconditions were not present. Gerschenkron supported his view by citing the example of England that capital was supplied to the early factories in England from previously accumulated wealth or from gradually plough back of profits – but extremely backwards states/countries which – could not have these preconditions of industrialization were compensated by the actions of bank and government. This great spurt could be provided by the World Bank which accumulated resources from the surplus units of the world for the world’s deficit units.

2.5 Empirical Review

Several empirical studies have supported the assertion of the existence of a relation between industrialization and economic growth in several economies of the world. For instance, Ebong, Udoh and Obafemi 2014 using time series for five decades (1960-2010) based on the Eagle-Granger two steps and Johansen co integration test, and the vector auto regression technique studied globalization and industrial

development in Nigeria. Findings clearly showed that globalization had significant impact on industrial development. They suggested that increasing the level of trade with the rest of the world would create opportunities to export local raw materials and import necessary input into the industrial process and that financial liberalization enhances industrial development. Hence, recommended that policies are required to reserve the tide of capital flight from the country and channel resources toward the industrial sector.

Likewise, Ogunrinola and Osabuohien (2010) examined the impact of globalization on employment generation in Nigeria's manufacturing sector using ordinary least square technique of analysis on a time series data for the period of 1990-2006 and discovered that globalization has a positive impact on employment level in the Nigerian manufacturing sector. Hence implying that countries who trade with other parts of the world generate employment into their economy which leads to economic growth.

On another study that relates to the developing economies conducted by Kaya (2010) which investigated the effect of the latest wave of economic globalization on manufacturing employment in developing countries with the use of a comprehensive dataset on 64 developing countries from 1980 – 2003. The study is concerned with classic debate on the benefits of industrialization and how this affects developing countries. The results generally demonstrate that manufacturing employment increased in most developing countries. First, this study finds that the level of economic development measured by GDP per capita is the most important factor influencing the size of manufacturing employment. Second, economic globalization also influences manufacturing employment in developing countries, but mainly through trade.

From another line of thinking, Ndiyo and Obongi 2003 with the use of the vector autoregressive technique of analysis examined the challenges of openness in developing countries for lessons to be drawn using Nigeria from (1970 – 2000). Empirical result from this study shows that globalization has had both positive and negative effect on the Nigerian economy. The negative effect according to Mike (2012) includes the challenges for industrial policies in Nigeria which are powerful tools to promote rapid economic growth and development. He observed that Nigeria has not been able to make appreciable progress in industrial development due mainly to policy failure. He stated that different government since independence have been trying out different approaches based on the dictates of those in power and those who advise them, stressing that the result has been policy summersault and inconsistency favouring rent seeking.

Also Gylych and Enwerem (2016) in their study the impact of industrialization on economic growth: experience of ten countries in ECOWAS between the periods of (2000-2013), revealed that industrialization has had a negative impact on economic growth in Nigeria in the long run. The methodology adopted was the use of Ordinary least square (OLS) technique. The study recommended that government should redirect its industrial and investment policy so as to increase output of the domestic production (RGDP), flexible exchange rate and control inflation rate since that showed that increase in exchange and inflation rate, decreased output. Also industrial and investment policy should be flexible on infant industries so as to encourage productivity and improve GDP.

A study by Isiksal and Chimezie (2016) indicated that no country particularly the developing ones has attained a level of economic growth without sub-sector linkage. They evaluated the Impact of Industrialization in Nigeria from 1997-2012 using the Johansen co-integration testing approach which demonstrated a significant long-run relationship between the three variables used. The results reveal that agriculture, industry and services have a significant positive relationship with GDP.

3.2 Research Design

It is essentially an Ex Post Facto account of the impact of industrialization on economic growth in Nigeria. This type of research explains how an independent variable, present prior to the study in the participant affects a dependent variable. It enables one variable hypothesized to be influencing another and does not use random assignment.

3.3 Sources of Data

The data for this study was obtained mainly from secondary source, which was collected from CBN statistical bulletin, economic and financial review of the CBN (various issues).

3.4 Method of Data Analysis

The behavioral relationship of the model was estimated by employing Auto-regressive Distributed Lagged Estimates (ARDL) technique. The choice to use the ARDL technique over other methods of analysis is based on the advantages it's possessed among others which are; it does not formally require pretesting of unit root, both short run and long run coefficient could be obtained simultaneously, it can be applied to variables irrespective of their order of integration whether they are purely I(0) and I(1) or mixed, it is efficient for limited sample data between 30 and 80 observations and large sample (Pesaran and Shin 1995).

3.4.2 Model specification

i Autoregressive Distributed Lag model

The preference of the model Autoregressive Distributive Lag (ARDL) was motivated by its appealing statistical and economic properties which take care of both 1(1) and 1(0) variables. The autoregressive distributive lag (ARDL) model is simple and easier to interpret and above all is very reliable. The following ARDL model was estimated in order to simultaneously obtain the long and short run coefficients for the explanatory variables (FDI, MLR, IND) and output growth (GDP) since these variables have mixed order integration of 1(1) and 1(0).

$$\Delta \ln GDP = C_0 + \beta_1 \ln GDP_{t-1} + \beta_2 \ln FDI_{t-1} + \beta_3 \ln MLR_{t-1} + \beta_4 \ln IND_{t-1} + \sum_{i=1}^p \lambda_i \Delta \ln GDP_{t-i} + \sum_{j=0}^q \Omega_j \Delta \ln FDI_{t-j} + \sum_{n=0}^q \pi_n \Delta \ln MLR_{t-n} + \sum_{z=0}^q \rho_z \Delta \ln IND_{t-z} + \varepsilon_t \dots \dots \dots (3.1)$$

Where

- FDI = Foreign Direct Investment
- MLR = Maximum Lending Rate
- IND = Industrial Output
- β = Long run multiplier
- Δ = Short run multiplier
- C_0 = Intercept and
- ε_t = White noise error.

ii Error Correction Model

A dynamic Error Correction Model (ECM) can be derived from ARDL through linear transformation. The ECM integrates the short-run dynamics with the long-run equilibrium without losing long-run information. The ECM test was carried out to show the speed of adjustment for the purpose of correcting the disequilibrium which occurred due to shocks in the variables. The relationship between growth rate (GDP) and the explanatory variables (FDI, MLR, IND) with an ECM was expressed as;

$$\Delta \ln GDP = \alpha_0 + \sum_{j=1}^p \gamma_j \Delta \ln GDP_{t-j} + \sum_{m=0}^q \Omega_m \Delta \ln FDI_{t-m} + \sum_{z=0}^q \sigma_z \Delta \ln MLR_{t-z} + \sum_{n=0}^q \tau_n \Delta \ln IND_{t-n} + \beta_1 \ln GDP_{t-1} + \beta_2 \ln FDI_{t-1} + \beta_3 \ln MLR_{t-1} + \beta_4 \ln IND_{t-1} + \pi ECM_{t-1} + \varepsilon_t \dots \dots \dots (3.2)$$

Here, the γ , Ω , σ and τ are the short run dynamic coefficients of the of the model convergence to equilibrium while π is the speed of adjustment.

3.4.3 Appriori expectations

Based on the above ARDL regression equation, it is expected that β_2 and β_4 are (>0) while β_3 is (<0). Therefore, β_3 is expected to be negative because an increase in lending rate in form of charges on loans for investment in the economy would reduce borrowing, hence investment is reduced leading to a fall in gross domestic product (reduced productivity). While β_2 and β_4 were expected to be positively related to gross domestic product in the sense that development in industrialization will encourage both local and foreign investors to partake in the productive sector of the economy hence leading to increase in FDI and IND which results to growth of an economy. $\beta_2 > 0$ $\beta_4 > 0$ $\beta_3 < 0$

Table 1: Unit Root Result at Level and After First Difference

Variables	ADF at level	first difference	KPSS at level	first difference	Zivot-Andrews Stat.
GDP	-0.178995	-11.87676***	0.304304	0.008476***	-1.719345**
FDI	-3.344593	-10.82878***	0.326395	0.006727***	-3.386340***
MLR	-2.619827	-10.72022***	0.358897	0.03674**	-4.592034***
IND	-14.45460***	---	0.047306**	---	-3.385473**

Source: Author's computation using E-Views (9).

Note: * significance at 10%, ** significance at 5% *** significance at 1%

4.2.2 Unit Root tests

These unit root tests are employed to show robustness, ADF, KPSS and Zivot-Andrews and the results are presented in Table 1 for all the study variables at levels and after first difference.

Results from Table 1 contains the unit root test conducted at level and after first difference for all the variables used in the study. The table shows that the variable Industrial Output proxied by IND is a stationary

time series variable and is well behaved at level as indicated by ADF statistics and KPSS LM statistics. The result of the variables of Gross Domestic Product (GDP), Maximum Lending Rate (MLR) and Foreign Direct Investment (FDI) indicated that the variables are non-stationary time series and became integrated and well behaved after first differencing $d(1)$ as indicated by ADF statistics and KPSS LM statistics. The results from the Zivot- Andrew statistics revealed that the variables in the study had structural break over time. This implied that the variables exhibited unexpected movement as a result of shock over time.

Table 2: Bound Test

Test statistics	Value	K	
F statistics	5.477332	3	
Critical value bounds			
Significance	1(0) Bound	1(1) Bound	
10%	2.37	3.2	
5%	2.79	3.67	
2.5%	3.15	4.08	
1%	3.65	4.66	

Source: Author's Computation Using E-view 9

4.2.3 ARDL bound test

The ARDL bound test is employed to ascertain the level of co-integration among the variables ie to show whether or not long run relationship exist among the variables. The result is presented in Table 2 below. Table 2 contains the result for the bound test for all the variables used in the study. The F-statistic for the bound test in the table is 5.477332; this result exceeds the 1 percent critical value (4.66) for the upper bound. This suggests that the variables of Gross Domestic Product (GDP), Foreign Direct Investment (FDI), Maximum Lending Rate (MLR) and Industrial Output are co integrated hence they have a long run relationship.

Table 3: Summary of Regression Result and Diagnostic Results for ARDL Model

Regressors	Coefficient	Standard errors	P-values
GDP(-1)	0.944284	0.024101	0.0000
FDI	-5.57E-09	6.56E-10	0.0000
MLR	-17.22875	14.00926	0.2210
IND	1.147916	0.559476	0.0422
C	152.1918	250.6242	0.5448
R-squared	0.983028	Adjusted R-squared	0.981825
	D W statistic	2.373473	
	F-statistic	817.3065(0.000000)	
	Serial correlation	1.040306(0.2019)	
	Normality	7633.690(0.000000)	
	Heteroscedasticity	2.136982(0.6792)	

Source: Author's Computation Using E-view 9

4.2.4 ARDL regression test

Table 3 contains multiple regression results for the impact of industrialization on economic growth in Nigeria. The coefficient of Maximum Lending Rate and Constant were found to be statistically insignificant at 10 percent level of significance as indicated by their probability values of 0.2210 and 0.5448 respectively; while the coefficients of Industrial Output and foreign direct investment were found to be statistically significant at 5 per cent and 1 percent level of significance as indicated by their probability values of 0.0422 and 0.000 respectively. A negative and insignificant impact was found to exist between Maximum Lending Rate and output growth, and a negative but significant impact was found to exist between Foreign Direct Investment and output growth. The coefficient of Industrial Output was positively signed and found statistically significant on output growth. This study negates the findings of Bennett, Anyanwu, and Kalu (2015) in their study on the effect of industrial development on economic growth in Nigeria. Their findings revealed an insignificant influence of Industrial Output on economic growth. Precisely, the coefficients of Foreign Direct Investment (FDI), Maximum Lending Rate (MLR), Industrial Output (IND) and Constant parameter were obtained as -5.57E-09, -17.22875, 1.147916 and 152.1918 respectively. This result therefore implied that, 1 percent change in maximum lending rate and Foreign Direct Investment will decrease the output growth by -17.22875 and -5.57E-09 percent respectively, while a 1 per cent change in Industrial Output will increase output growth by 1.147916 percent. The F-statistics 817.3065, which measured the joint significance of the parameter estimates, was found statistically significant at 1 per cent level as indicated by the corresponding probability value of 0.000000. This implies that all the variables of the model were jointly and statistically significant in affecting the GDP of the Nigerian economy. The R^2 value of 0.983028 (98 per cent) implied that about 98 per cent total variation in GDP was explained by FDI, MLR and IND in Nigeria. Coincidentally, the model was found fit after

taking into account the loss in the degree of freedom as indicated by the adjusted R^2 ($R^2 = 0.981825$ or 98 per cent). The Durbin-Watson statistic 2.373473 was observed to be higher than the R^2 0.983028, which indicates that the model is non-spurious (meaningful). The probability values of the Diagnostic statistic of serial correlation 1.040306 (0.2019) and heteroscedasticity 2.136982 (0.6792) have indicated that the model has passed the test for serial correlation and heteroscedasticity. But, the model is not free from the problem of normality as indicated by its significance value 7633.690 (0.000000). However, the presence of this problem does not affect the estimates (Laurenceson and Chai 2003) since the time series constituting the equation are of mixed order of integration, i.e. $I(0)$ and $I(1)$.

Table 4: Error Correction Representation for Selected ARDL Model

Regressors	Coefficient	Standard error	P-values
dFDI	-0.000000	0.000000	0.0000
dMLR	-25.753823	30.200337	0.3954
dIND	1.163390	0.483246	0.0175
CointEq(-1)	-0.055616	0.012051	0.0000

Source: Author's computation using E-views 9

4.2.5 ARDL Error Correction Model

The co integration test is employed to show the error correction (speed of adjustment) in the long run i.e. the period at which shocks that occur in the system is adjusted over time. The result from Table 4 shows that the coefficient of the co integrating equation (-0.055616) has a low magnitude and is negatively statistically significant. This result implies that the disequilibrium which occurred due to a shock is corrected in the sixteenth quarter at about 6 per cent per quarter.

This shows that the speed of adjustment is weak as the disturbance/disequilibrium converges back to the long term equilibrium at a slow pace of 6 per cent. The result further revealed that a change in Foreign Direct Investment (dFDI) has a negative significant association with the change in the Gross Domestic Product (dGDP), change in Maximum Lending Rate dMLR has a negative and insignificant association with change in output growth (dGDP) while change in Industrial Output (dIND) has a positive significant association with change in Gross Domestic Product (dGDP)

5.2 Conclusion and Recommendation

An effort so far has been made in the study to concretize the fact that industrial development is an essential ingredient for a proper and sound economic transformation. Thus, industrialization is the principal solution to the complex problems of Nigeria as well as other under-developed countries and it is the main key to economic growth. However, from our empirical analysis by any standard Nigeria would be classified as industrially under developed, as effort that has been put into the industrialization process in the past years has exerted minimal impact on the output growth of the economy. This is not farfetched from the fact that Nigeria is considered a mono economy and is attracted by the high revenue generated by the oil sector of about 90 per cent contribution to GDP. But the fact remains that the international market is partly controlled by external forces that are beyond Nigeria's control as a participant in the market. These forces have caused the price of the mono product (oil) which Nigeria depends on for its inflows in the economy (huge revenue) to be highly affected hence dwindling. Despite the decline in the contributions of the manufacturing sector over the years due to major problems of industrialization and neglect by government; findings from this study revealed that industrialization has positive impact on GDP which is contrary to opinion of other empirical literatures in the study. It is therefore recommended that there is a need for reviving the key industries (eg textile and steel industries) in the nation that have been abandoned for long and also a proper allocation and management of existing industries so as to ensure proper and positive linkage effects on the economy. Government should introduce policies that can create fair playing ground for foreign investors as this will attract more foreign investors to come and invest locally which will in turn leads to enhanced economic growth. The Industrial Banks should be able to assist Nigerian industrialization in line with Nigeria's development plan and not a total shift to accepting models which worked elsewhere given their environment and circumstance which differs from place to place.

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