Industrialization and Economic Growth Relationship in Nigeria

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DOI: http://dx.doi.org/10.15520/jassh20669

Abstract: This paper investigates the impact of industrialization on economic growth in Nigeria from 2001 to 2013. The paper employed Ordinary Least Square (OLS) techniques in estimating the relationship between industrial output, industrial employment and economic growth, after which ADF unit root test was conducted alongside Breusch-Godfrey serial correlation LM test and Breusch-Pagan-Godfrey heteroskedasticity test. Based on the results of this study, the importance of industrialization to economic growth cannot be overemphasized. The OLS result of this study revealed that industrialization will go a long way in stimulating economic growth in Nigeria. The coefficient of industrial output shows that increase in industrial output will increase economic growth. This paper therefore, recommended that government and its relevant authorities should provide conducive investment environment by removing the structural rigidities that exist in the economy to encourage industrial activities. Government should endeavour to provide stable supply of power, good roads for transportation of goods and people, functional legal system, security of lives and property, infrastructural facilities etc. All these would boost industrial output thereby making goods and services readily available to meet the ever increasing demand in order to prevent inflation and subsequently lead to industrial expansion and improvement in economic growth of the economy. Based on the coefficient of industrial employment; increase in industrial employment will increase economic growth. This paper therefore, recommended the need to formulate policies to increase industrial employment which may likely improve the welfare of Nigerians which would provide employment opportunities for the people. The coefficients of elasticities revealed the extent to which industrial output and industrial employment affects economic growth in Nigeria. It was found that economic growth was highly susceptible to change in industrial output and less susceptible to change in industrial employment this paper therefore, recommended that more effort should be channel toward increasing industrial output than industrial employment so as to achieve the desired economic growth.

Key words: Industrialization, industrial output, industrial employment, economic growth

INTRODUCTION

Many economies share the view that industrialization is a prerequisite for the economic take off on economic development of any country. According to Jhingan (1997), industrialization is the process of manufacturing consumer goods, capital goods and creating social overhead capital in order to provide goods and services to both individual and business. While Anyanwu (1986), depicted industrialization as the process of building up a nation’s capacity to convert raw materials and other inputs to finished goods manufactured goods for other production or for final consumption. As such industrialization plays a major role in the economic development of nation. Industrialization offers substantial dynamic benefit that are important for changing the traditional structure of the less developed economy and advocacy for industrialization may be particularly compelling of export demand having top provide employment for rapidly increasing labor force. Industrialization is widely believed to be the most reliable means of raising a country’s standards of living (Daggio, 1980). This explains why less developed countries (LDC’s) pursue the goal of industrialization and single-mindedness.

Furthermore, the less developed counties need industrialization to free themselves from the adverse effects of frustration in the price of Primary products and determination in their terms of trade, such countries mainly export primary product and import manufactured goods which often lead to determination in the terms of trade or less developed countries(LDC’S). However, many countries in their early stage of industrialization prefer to use small-scale plant that uses more labor, than machine in their production process so that unemployment will reduce to the minimal. Most of their industries are good processing industries which depends heavily on Agriculture raw materials such as fruits, cereals wools etc. they are referred to as agro-based industries which mainly agricultural economic. As industrialization progresses, the industrialization countries gain more technical and managerial experience in large scale capital goods such as automobile ships complex electronics etc. Nigeria’s journey towards industrialization state, immediately after her independence when the country adopted the import substitution policy in 1960, this strategy come into being because of the belief that through industrialization, the Nigeria government would be able to promote the emergence and expansion of domestic industries by replacing major such as textile, shoes, food and detergents. Industrial development in Nigeria though are rudimental in nature because is underdeveloped, and is tremendous in its importance as a potential source of employment as well as rising the per capital income and standard of living of the large and expanding population of Nigeria. In recent time, policy makers in Nigeria have come to place a special emphasis on the role of industrialization as a strategy for
development. The emergence of export processing zone and free export points to this fact, it is the believe of the policy makers that if these policies are implemented the country will attain the goal of national economic development faster.

Statement of the Problem:

Although industrialization plays an important role in its relationship with economic growth in the western world, through the promotion of growth, but this does not applies to developing countries like Nigeria because policies of industrialization were adopted ranging from import substitution to export promotion but no significant achievement was recorded (Afolabi, 1999). Though a lot of literature has been done in that aspect, but not much can be said to be achieved in assessing the impact of industrialization on economic growth in Nigeria during the last two decades. The industrial policy of import substitution end up making Nigeria the net importer of food while export promotion strategy of industrialization also fail to achieving the desire objective for which it was formulated this remain the subject for debate as to whether import substitution is the best or export promotion. This means despite all efforts of the government to industrialize Nigeria, little or nothing to show. This paper therefore, ispoise to assessing the impact of industrialization on economic growth in Nigeria with a view to proffering solution to the lingering debate.

Objective of the Study:

The main objective of this paper is to empirically examine the impact of industrialization on economic growth in Nigeria. The specific objectives are to:

i. Assess the impact of industrial output and industrial employment on economic growth in Nigeria.
ii. Evaluate the extent to which industrial output and industrial employment affect economic growth in Nigeria.
iii. Assess factors affecting industrial development in Nigeria.

Research Question:

i. What is the impact of industrialization on economic growth in Nigeria?
ii. To what extent does industrial output and industrial employment affects economic growth in Nigeria?
iii. What are the factors affecting industrial development in Nigeria?

Research Hypothesis:

The hypothesis for this paper were formulated as follows
Ho: there is no significant relationship between industrialization and economic growth in Nigeria.
H1: there is significant relationship between industrialization and economic growth in Nigeria.

LITERATURE REVIEW

This section focused on review of the literature based on the study, then examined a theoretical frame work on which the study was based. A lot of individual have in the time past carried out some research about the role industrialization has played in economic development. It is pertinent at this junction to review their work, findings and conclusion on this subject matter.

Conceptual Framework:

Here basic concepts of industrialization and economic growth were discussed.

The Concept of Industrialization:

According to Balami (2006) industry is conceptualized as the coming together of firms or group of firms producing either identical or similar products. To Alfred Marshal industry is a group of independent firms which produce identical or similar goods and services. He further pointed out that industry is concerned with the activities of people in a firm in relation to wealth. Industrialization is conceptualized as the concentration of industry in an area. Concentration of industries in the economy tends to create employment opportunities, which in turn reduces poverty and wide spread income inequality thereby improving economic growth.

Industrialization in Nigeria:

Industrialization in Nigeria was based on the processing of raw materials in order to reduce bulk and minimize freight cost, and to add value to the products exported out of the country. Very few industrial establishments were based on imported raw materials e.g. soft drinks, beer and tobacco. The industrial production was also based on British or foreign technology thus making ownership predominantly foreign (Adeboye; 1989; Anyanwu, et al, 1997).

By 1960, there was a strong need to industrialize the country. This need was later reflected in the First National Development Plan, where industrialization was made second only to agriculture by 13.4 per cent in terms of spending. Emphases were mostly laid on the growth of light consumer based manufacturing industries that are import-substituting activities; the emergency of industrial concentration or estates; and the expansion of foreign ownership and control. In respect to foreign ownership and control about 110 industries were wholly owned by foreigners, 52 wholly owned by Nigerians, 14 wholly owned by the Federal Government, while 115 were joint ventures with foreigner having the largest shares in 73 firms (Adeboye 1989). This period also witnessed a slight rise in the contribution of the manufacturing industries to the country’s Gross Domestic Product from N37.8 million i.e. about 2.8 per cent (in pre-independence years) to N55.2 million or 3 per cent (Abubakar 1989; Adeboye 1989; CBN 1993).

In the 1970s, the various Enterprises Promotion Decrees reversed the issue of ownership e.g. the Indigenization Degree of 1976 that gave Nigerians 60 per cent share and foreigners 40 per cent. This period also witnessed very rapid growth in industrial investment, output and the number of industrial establishments. The period was also characterized with the growth of import-substitution industries with traditionally light consumer goods producing 80 per cent of domestic consumption; the growth of government intervention which was aimed at expanding the import-substituting strategy in order to attain self-
Factors That Influence Industrialization:

Mills (1976), further argues that a proper industrial development strategy is a sine qua non for development. Development in the level of development of the productive forces (and more especially, in the productivity of labor) as well as increasing mastery by the direct producer over the process of social product. Dominated sector of the less developed countries, their agreement resulted from the fact that behavior of this sector is determined by external and internal factor like deterioration in terms of trade and act of God like drought. They concluded therefore that to rely exclusively on the expansion of the primary factor for fast and sustained growth could not be a viable policy, as far as they are concerned the desire to industrialize is born out of a desire for an overall structural change. According to Anyanwu (1996), industrialization involves the development of technical arrangement techniques, he further stress that industries development tends to propel goods and quickens the achievement of structurally utilize fully its factor endowment, depends less on the external sector for its growths and sustenance. According to Abba and his colleague (1985) define industrialization as the process of developing the capacity of a country to master and locate within its borders, the whole industrial production process, production of raw material, fabrication of machines and tools required for the manufacturing of desired products and mechanized skills to operate, maintain an reconstruct the machines and tools to manage factories and to organize the production process. Ahaive and Denwoha (1997) from the Caliber study, view industrialization as the mechanization of agricultural reduction as a spring board, and subsequently improve all other industrial techniques progressiveness for the wellbeing of the society. This can be enhanced through government policies and enlightenment campaign, furthermore, Berley (1976), described industrialization not just as a question of economics selecting projects which can be proved to be variable in commercial terms and guarantee to provide employment for certain number of workers in order works. Industrialization is one aspect of them, if it takes its place as one of a number of activities introduced as part of well thought out development policy.

Assessment of the Level of Industrialization in Nigeria:

Africa being a developing continent experience industrialization in the industrial sector. According to Dsagie (1980), the manufacturing industries of ECOWAS nations are rudimental. He found out that in most cases, the manufacturing industries only assemble final parts, which is the easiest stage of production process, he then blame the level of industrialization at it infect stage on the factor of colonialism. The colonized nations applied materials to the industrialized nation who in turn supplied to the colonial masters the requirement for manufacturing. Terbia and Kayode (1977) in theirown contribution to the literature on industrial development in Nigeria are of the opinion that less developed countries (LCD’S) industrialization has come to be the key to the development proves. They tried to give reasons for the appeal of compelling urge for industrialization despite the abundant agriculture and mineral resources. Intheir opinion export. Oyejide (1975) supported this view, although he called it a process of diversification, he went on to say that this is essentially a movement sector to a situation where the modern industrial sector becomes much more important both as a source of employment and as a contribution to gross domestic product (GDP). More so (1980), sees industrialization not as a straight jacket operation as a spread of industry techniques of Organization and production in an endeavor to actively control and manipulate the physical environment in the interest of society. It has historically been to rises output per head and to develop economics that become nationally integrated, flexible and capable of self-generated and self-sustaining growth. Owoseku and Ofiga (1976) look at the gains of industrialization. According to them, industrialization help to increase national income, stabilized foreign exchange earnings by diversification of export, promotes import substitution and provides productive employment. As earliest stated, Nigeria had experimented with import substitution industrialization strategy whose means is food. According to Nyong (1995) assembling
process with the expressed aim industrialization from the top down would through the ultimate production of intermediate products and final goods, the failure of ISI after decades of experimentation, leads to the adoption of export industrialization strategy in the mid-1980s, this is the current issue and its main focus is on the processing of raw materials and the manufacturing of semi-finished products of export. According to Jhingan (1997), industrialization is a process of manufacturing consumer goods, capital goods and creating social overhead capital in order to provide goods and services to both the individual and business. Bosodesten and Reed (1994) view industrialization as the transformation of low income society using tradition technologies and producing mainly primary produce, both products and varieties of finished goods. Surdiffe (1997) sees industrialization from a quantitative point of view, in his view a country of whose GDP arose to 25% in the industrial sector of which at least 60% was in manufacturing and at least one tenth (1/10) of its total population employed in industry would be counted as industrialized.

Import Substitution Policy:

The dominant strategy of industrialization has been the production of consumer goods, in substitution for imports. Living the existing demand for imported consumer goods, it was simple to base the post war rationale for industrialization the home replacement of these finished goods (in most industries by importing the components and engaging in the final assembling process, in the hope of proceeding to industrialize from the top down ward through the ultimate production of the intermediate products and capital goods). Besides allowing the home replacement of an existing market, import substitution, also have considerate appeal by virtue of the common believe that it would help meet the developing country’s balance of payment problem.

Although the widespread pursuit of import substitution has in practice based mainly on the objectives of industrialization and balance of payment, proportionate of industrial protectionism have adduced several special argument in the content of development argument that should be considered more seriously than the usual simple assertion about a “natural” infirmity of agriculture or the supposed necessity of industrialization to achieve a rise in the level of income. Support for import replacement comes partly from an appeal to the experience of industrialized countries. Historically, studies of some countries show not only that the share of industrial output raise with development, but also that the growth of industries based on import substitution, account for a large proportion of the total increase. It is also true that “much of the recent economic history of same rapidly developing countries can be written, in terms of industrialization working its way backward from the final to that of the basic industrial material at first, the country may import semi-finished material and perform domestically the final touches of converting or assembling the almost finished industrial import into final products, later on with the growth in demand for intermediate components and basic goods of home, the market has become sufficient large to reach a domestic production threshold. Another special argument for industrialization via substitution rest on the contention that a peripheral country’s demand for its export, so that the country most supply all those industrial product which cannot be imported in view of the relatively slow growth of its export, if we accept the income elasticity of demand for imports and either imported or produced at home and that country has no other means of increasing its capacity to import, then there is prima facie a case for industrial production to encourage import substitution.

Export Promotion Policy:

In contrast with industrialization via import substitution there is an increasing interest in the potentialities of an industrialization strategy that emphasized export substitution, that is non-traditional exports such as processed primary products exports it can be argued that the export substitution process has some distant disadvantages over import substitution process in terms of relaxing a country’s foreign exchange constraint a unit of foreign exchange earned by export substitution, but there are other consideration in favor of export substitution. The domestic resources cast of saving a unit of foreign exchange, in other words the resource used in import substitution could have earned a greater amount of foreign exchange through export substitution. These relies on high effective rate of protection, some empirical studies of the factor requirement of industrial exports and imports indicate that if capital and foreign exchange are true constraints and labor is not the value of import could be replaced. Moreover, to the extent that it rest on exogenous world demand, the process of industrialization through export substitution is not limited to the narrow domestic marked of the import substitution process.

The inflow of foreign capital to support export substitution is not dependent on home market protection but induced by consideration of efficiency on the side of the resource cost. Foreign investment for export substitution also tends to have more linkage to agriculture when it involves its processing of primary products. It also up grades labor skill, when it involves the production of labor intensive, semi-manufacturers most importantly export substitution contributes to more than those import substitution to the objective of greater employment and improvement in the distribution of income. Being labor intensive in production techniques and dependent on exogenous demand, the non-traditional aspect may directly absorb more labor than import replacement and many also reduce the cost of employment in terms of complimentary use of scare factor of capital imported input. The export substitution process utilizes the surplus factor of labor more intensively than does the import substitution process and it also allow the scare complementary factor to be more productive. Experience has shown that countries which have had export oriented development strategies appears by and large to have intervened virtually as much as “classically” on the side of promoting new exports as other countries have on the side of import substitution, yet the economic cost of incentive distorted towards export promotion appears to have being less than the cost of this distortion toward substitution and growth performance of the countries toward
export promotion and seems to have more satisfactorily than that of the import substitution oriented countries. If that conclusion is valid, the lesson is that policy should be on the side of allowing higher marginal cost for earning than for saving foreign exchange.

**The Concept of Economic Growth:**

According to Balami (2006) Economic growth which is always proxy by GDP is often conceptualized as increase in output of an economy’s capacity to produce goods and services needed to improve the welfare of the country’s citizens. Growth is seen as a steady process which involves raising the level of output of goods and services in the economy, for example, rise in the Gross Domestic Product (GDP). Growth is meaningful when the rate of growth is much higher than population growth because it has to lead to improvement in human welfare. Therefore, growth is seen as a steady process of increasing the productive capacity of the economy and hence, of increasing national income, being characterized by higher rates of increase of per capita output and total factor productivity, especially labour productivity. According to Fajingbeji and Odusola (1999) though economic growth is associated with an increase in capital per head, capital is not the only requirement for growth.

Thus, if capital is made available without, at the same time, providing a framework for its use, it will be wasted. And as Hemming (1991) observed, that growth is influenced by the composition of expenditure, since certain types of spending have more effects on growth. Essential among these types of spending are provision of socio-economic infrastructure, operations and maintenance, and general administrative and legal frameworks. Arguing in the same vein, Ogiogio (1995) emphasized that adequate funding of public sector recurrent budget makes for an effective and functional civil service, and hence, the effectiveness of implementation of development policies and programmes. As analysed by Hemming (1991), even apparently less productive expenditure, security, for example, provides social and political stability that is necessary for growth, and reducing such spending could be counter-productive. The main conclusions that can be drawn are that public expenditure contributes to growth, and that composition rather than the level which is important.

This thesis is concern with the rate of growth of the economy i.e. GDP growth rate. The rate of GDP growth can be measured by adopting the well-known compound interest formula as a framework. We can recall the compound interest formula

\[ Y_t = Y_o(1 + r)^t \]  

(2.1)

Where \( Y_t \) is the current year output/income, \( Y_o \) is the previous year output/income; \( r \) is the compound rate of growth of \( Y \) (GDP). Assuming \( t = 1 \), equation one will be written as follows

\[ Y_t = Y_o(1 + r) \]  

(2.2)

\[ Y_o = Y_o - 1 + r \]  

(2.3)

Therefore \( r = \frac{Y_t}{Y_o} - 1 \)  

(2.4)

Equation (2.4) can therefore be used as a framework for measuring rate of growth of GDP in the country. According to Balami (2006) there are three different measurements for economic growth namely: nominal measurement of growth, real output growth rate as a measure of economic growth and growth measured in per capita values. According to Wikipedia, the free encyclopedia (2013) economic growth is measured as a percentage change in the Gross Domestic Product (GDP) or Gross National Product (GNP). These two measures, which are calculated slightly differently, total the amounts paid for the goods and services that a country produced. As an example of measuring economic growth, a country that creates $9,000,000,000 in goods and services in 2010 and then creates $9,090,000,000 in 2011, has a nominal economic growth rate of 1% for 2011. Inflation or deflation can make it difficult to measure economic growth.

**Factors Affecting Economic Growth:**

Ndio and Ebong (2003) stated that, the economic routes through which macroeconomic variables affect a given economy include the following:

**The Concept of Openness:**

Economic growth is an overriding objective in developing countries. The share of imports and exports in overall output provides a ready measure of the extent of openness of an economy. It is weighted sum of merchandise imports and exports divided by GDP (Slaughter and Swagel 1997:2). Growth theories suggest that there is a positive relationship between openness and the rate of growth of GDP in the long run. According to Ekpo (1995) openness to trade enhances economic growth rate since it provides access to a variety of imported inputs, especially technology. Again, openness expands the market for domestic exports returns to innovation and specialization (Romer 1986; Matin 1992; and Ekpo 1995). But Matin (1992:2) points out that the new growth literature does not predict that greater openness will unambiguously raise the growth rate of national output. According to him, they rather show that growth can be lowered by increased foreign competition or it can be increased by import protection, if protection promotes investment in research-intensive production. Hence, since the new growth literature is not clear about how increased openness, affects the growth rate of an economy, the direction of the growth impact of openness therefore, remains an empirical problem.

**The Concept of Foreign Direct Investment (FDI):**

Classical economists argue that international capital mobility allows countries with limited savings to attract financing for productive domestic investment projects which enables investors to diversify their portfolios, spreads investment risk and promotes intertemporal trade. In turn, higher rates of return can encourage saving and investment that deliver faster economic growth. There is, therefore, a positive relationship between FDI and economic growth.

**The Concept of External Reserves:**

The external reserves of a country are the financial assets available to its monetary authorities to meet temporary imbalances in external payments position and to
pursue other policy objectives. This is because changes in net foreign assets influence the level of money supply directly. Therefore, one of the major objectives of external reserves management is to maintain an adequate level of reserves to facilitate international transactions. This of course can affect economic growth positively.

The Concept of Foreign Exchange Rate:

The strength of a country’s currency depends on a number of factors, including the state of the economy in terms of the competitiveness and volume of its exports, the level of domestic production and the quantum of foreign reserves (CBN 1999). In a free-market system, the exchange rate of a country’s currency is determined by the forces of the supply and demand for that currency. The objectives of exchange rate policy are to preserve the international value of the domestic currency, maintain a favourable external reserve position and ensure external balance without compromising the need for internal balance and the overall goal of macroeconomic stability. Therefore, a globalization process that leads to high naira exchange rate can further increase distress in the economy.

The Concept of Net Foreign Indebtedness:

Growth theories suggest that reasonable levels of borrowing by a developing country are likely to enhance its economic growth. Countries at early stages of development have small stocks of capital and are likely to have investment opportunities with rates of return higher than those in advanced economies (Pattillo et al 2000). As long as they use the borrowed funds for productive investment and do not suffer from macroeconomic instability and policies that distort economic incentives, growth will increase.

The Concept of Fiscal Policies:

Fiscal deficit is a good indicator of overall macroeconomic stability. High deficits cause external debt crisis, inflation, shortage of foreign exchange, high interest rate and crowding out of investment. Deficit trigger volatility in interest and exchange rates and render highly indebted countries vulnerable to global market forces and declining national savings and investment (Masson 1985). Anyanwu (1997) was of the opinion that fiscal deficits siphon funds from productive investment, thereby retarding growth and, ultimately, reducing standards of living.

The Concept of Average World Prices:

Continuous rising prices cause economic depression. Inflation is an economic phenomenon that depicts a persistent rise in the general price level. It has a widespread effect on every citizen and all sectors of economy. When prices rise the purchasing power of money falls and this leads to the impoverishment of the lower, middle and poorer sections of the society (Gbosi, 1990). It is a problem that has often proved difficult to solve because of any attempt to reduce it would entail a trade-off among other important macroeconomic and social objectives such as employment, social safety nets, crime and economic growth (Jhingan, 1997). But, inflationary pressures cause an excessive drain of the country’s foreign exchange reserves as imports become cheaper.

The Concept of Balance of Payments:

Net exports or trade balance is often defined as exports less imports. When trade balance is negative there is a trade deficit, and if it is positive, there is a trade surplus. The balance of payments account keeps track of all the trade transactions between one country and the rest of the world. There are two parts to the balance of payments, namely, the currents account and capital account (for details of these subaccounts, see Taylor 1995: 1040-46).as a monetary tool, a favourable balance of payments position is an indication of a healthy economy. However, fiscal policies for economic growth and stability demands that these variables be kept under strict control.

Theoretical Framework:

Here major theories of economic growth and industrialization were discussed. The relevance of these theories to the problems of economics and industrial development were also discussed. We shall highlight some major policies and theories, and their relevance to the industrial development in Nigeria.

The Solow Growth Theory:

This is an economic growth model in which the growth of total GDP is explained by population increase, technical progress, and investment. In this model there is full employment, with an aggregate production showing constant returns to scale. In analysing the process of economic growth Brian and Howard (2005), Solow (2002) combined the supply and demand sides of the economy together to generate economic growth. He argued that economic growth can best be understood from neo-classical point of view (supply side) which says \( Q = f(AK^{\alpha}L^{1-\alpha}) \). Hence, the Solow model can also be referred to as the neo-classical growth model. He assumed that savings is a linear function of income, that capital does not depreciate so that investment is simply the rate of increase of capital stock, that savings is equal to investment, and that labour grows at an exogenous constant proportion, the rate of growth or level of technology is exogenously given. Hence the Solow model can also be referred to as the neo-classical growth model.

Assumption:

i. Saving is a linear function of income: \( S = sY \) where \( S = \text{MPS} \) and lies between 0 and 1.

ii. He assumed that K does not depreciate so that I is simply the rate of increase of capital stock

\[
I = \delta k/\delta t \text{ or } K^* \\
i.e. K_1 - K_{t-1}
\]

iii. \( I = S \)

\( S = K^* \) and \( K^* = sY \)

iv. The Labour grows at an exogenous constant proportion rate i.e. \( L_{t+1} = L_0 e^{nt} \)

Where \( n \) is the rate of growth of population. In other words, population grows at a constant proportional rate. The rate of growth or level of technology is exogenously
given at a rate g. Note that the rate of technology development is determined outside the economy. Macroeconomic Policy Implication of Solow’s Model—according to Balami (2006) In the long run, the rate of growth of (per capita) GDP is determined by population growth and the rate of technical progress. Higher investment can speed up growth temporarily, but as the capital-output ratio rises, an increased proportion of GDP needs to be invested to equip the increasing labour force, and the capital-output ratio converges towards a finite limit, however high a proportion of GDP is invested. Low investment slows down growth, but the capital-output ratio falls towards a lower limit which is always positive for positive investment.

The Lewis Theory of Growth/Development:

According to Todaro and Stephen (2011) one of the best-known early theoretical models of development that focused on the structural transformation of a primarily subsistence economy was that formulated by Nobel laureate W. Arthur Lewis in the mid-1950s and later modified, formalized, and extended by John Fei and Gustav Ranis in 1997. The Lewis two-sector model became the general theory of the development process in surplus-labour developing nations during most of the 1960s and early 1970s, and it is sometimes still applied, particularly to study the recent growth experience in China and labour markets in other developing countries.

In the Lewis model, the underdeveloped economy consists of two sectors: a traditional, overpopulated rural subsistence sector characterized by zero marginal labour productivity—a situation that permits Lewis to classify this as surplus labour in the sense that it can be withdrawn from the traditional agricultural sector without any loss of output—and a high-productivity modern urban industrial sector into which labour from the subsistence sector is gradually transferred. The primary focus of the model is on both the process of labour transfer and the growth of output and employment in the modern sectors. The modern sector could include modern agriculture, but we will call the sector “industrial” as a shorthand. Both labour transfer and modern-sector employment growth are brought about by output expansion in that sector. The speed with which this expansion occurs is determined by the rate of industrial investment and capital accumulation in the modern sector. Such investment is made possible by the excess of modern-sector profits over wages on the assumption that capitalists reinvest all their profits. Finally, Lewis assumed that the level of wages in the urban industrial sector was constant, determined as a given premium over a fixed average subsistence level of wages in the traditional agricultural sector. At the constant urban wage, the supply curve of rural labour to the modern sector is considered to be perfectly elastic Todaro and Stephen (2011).

The New Growth Theory (Romer, 1990):

New Growth Theory is based on a view of the economy that incorporates two important views. First, it views technological progress as a product of economic activity. Previous theories treated technology as a given, or a product of non-market forces. New Growth Theory is often called “endogenous” growth theory, because it internalizes technology into a model of how markets function. Second, New Growth Theory holds that unlike physical objects, knowledge and technology are characterized by increasing returns, and these increasing returns drive the process of growth Balami (2006).

This new theory addresses the fundamental questions about what makes economies grow: Why is the world measurably richer today than a century ago? Why have some nations grown more than others? The essential point of New Growth Theory is that knowledge drives growth.

Because ideas can be infinitely shared, ideas could be accumulated without limit. They are not subject to what economists call “diminishing returns.” Instead, the increasing returns to knowledge propel economic growth.

New Growth Theory helps to make sense of the ongoing shift from a resource-based economy to a knowledge-based economy. It underscores the point that the economic processes which create and diffuse new knowledge are critical to shaping the growth of nations, communities and individual firms. According to Romer (1993), all increases in standards of living can be traced to discoveries of more valuable arrangements for the things in the earth’s crust and atmosphere. No amount of savings and investment, no policy of macroeconomic fine-tuning, no set of tax and spending incentives can generate sustained economic growth unless it is accompanied by the countless large and small discoveries that are required to create more value from a fixed set of natural resources Romer (1993, p. 345), emphasized that people tend to focus on the computer and the Internet as the icons of economic progress, but it is the process that generates new ideas and innovations, not the technologies themselves, that is the force that sustains economic growth.

Romer (1993) is credited with stimulating New Growth Theory, but as Romer himself noted, (Romer 1994) there is really nothing new about the theory itself. The central notion behind New Growth Theory is increasing returns associated with new knowledge or technology. The cornerstone of traditional economic models is decreasing or diminishing returns, the idea that at some point as you increase the output of anything (a farm, a factory, a whole economy) the addition of more inputs (work effort, machines, land) results in less output than did the addition of the last unit of production. Decreasing returns are important because they result in increasing marginal costs (that is, at some point, the cost of producing one more unit of production is higher than the cost of producing the previous unit of production). Decreasing returns and rising marginal costs are critical assumptions to getting the mathematical equations economists use to describe the economy to be settling down to a unique equilibrium.

Implications of New Growth Theory:

According to Balami (2006), the New Growth Theory has impressed some economists to the extent that it is likely to lead academics to revise textbooks. There are a number of practical implications from New Growth Theory that should guide us as we think about how to formulate programs
designed to stimulate economic growth. According to him if countries accept the theory, it should lead to change our views of the importance of history in shaping development trajectories, in the role of institutions in providing a framework for growth. It should also revive our interest in the importance of place to development

**Gerschenkron’s Great Spurt Theory:**

Alexander Gerschenkron, an economic historian, (1962) examined the traditional economies of countries as the attempt to achieve industrialization. He looked for similar characteristics and difference among countries and analyzed the process of change, in each consequently, he described some common stages through which underdeveloped countries must pass through to achieve economic development. According to Gerschenkron, given country’s degree of economic backwardness on the event of its industrialization, the course and character of it industrial development tended to change in many ways. He summed up these changes into the following six generation:-

I. **The more backward a country’s economy, the more pronounce the stress in its industrialization on dryness of both plant and enterprises.**

II. **The more backward a country’s economy, the greater the stress upon producers goods as against consumer goods.**

III. **The more backward a country’s economy, the more backward its industrialization, as a great sport proceeds at a relatively high rate of growth of manufacturing output.**

IV. **The more backward a country’s economy, the greater the role the plant played through special industrial factors designed to increase supply of capital to the nascent industries and in addition to better informed entrepreneurial guidance.**

V. **The more backward a country, the less likely its agricultural sector play an active role by offering to the growing industries. The advantage of an expanding industrial marked based on its rising productively of agricultural labor.**

**Common Characteristics of Nation:**

Gerschenkron pointed towards three common characteristics of nations on the threshold of industrialization. Firstly, there may be some scarcities and obstacles. But these are not so serious as to obstruct development. Secondly, there is quite a large number of populations which is beginning to understand the potential benefit of industrialization as a substantial group of people are actively trying to seek new opportunities for greater prosperity. Thirdly, there is tension between the existing economic institution and progressive arrangement. The tension is the greatest in nation which start late on the path of development, this is because the existing economic relationship in such countries are extremely backward relative to those of more develop countries.

**How to Bring About the Great Spurt:**

Severe tension between economic backwardness and the urgency of development necessities a big spurt of industrial development in many directions. According to Gerschenkron, for industrialization, the existence of certain “necessary condition” was not required for industrialization as put forth by Roster. He based the view on two empirical observations. First the pre-condition for industrialization that existed in England was either absent in the backward countries of Europe or existed on a very small scale.

Secondly, a big spurt of industrialization occurred even in those countries where such pre-condition were present in his support of his contentions, he cited the example of Italy, before 1880, Italy economy claimed very backward in relation to the advanced economies of Europe. Whatever the big push theory founded by Professor Paul N, Resentein Rodan has seen the need for infrastructures which is the bed rock for industrial development and hence economic development. According to big push theory, social overhead capital the most important instances of indivisibility and hence of external economic of the supply side. The most important product are investment opportunities creating in other industries social overhead capital which comprises all these basic industries like power, transport, communication etc. A look at the state of infrastructure in Nigeria will tell us that there is gross inadequate provision of those highly needed infrastructure for economic development.
Synthesis of the Theories:

Taking a critical look at the brief history and the present state of Nigerian economy, the appropriate theory and policy to apply in the pursuit of industrialization in Nigeria should be the export promotion policy and “big push” theory. The above reasons that account for the preference of the export substitution policy over the import substitution policy and the theories of economic development through industrialization are as follows: The big push theory has the need for infrastructure which is its bedrock for industrial development and hence economic development. According to big push, social overhead capitals the most important instance of indivisibility and hence of external economies on the supply side. The most important product are investment opportunities created in other industries, social overhead capital which comprises all those basic industries like power, transport, communication, etc. A look at the state of the infrastructure in Nigeria will tell us that there is gross inadequate and provision of this highly needed infrastructure for economic development. Therefore for the country to be launch into a self-sustaining growth and development, a minimum level of resource (capital) must be developed to the provision of social overhead capital. Another policy of great importance to industrialization and hence economic development in Nigeria is the export promotion policy (and the big push theory). This theory and policy is highly relevant to industrial development, in the less developed country because of some advantages it has over its cousin policy, the import substitution industrialization policy.

Generally speaking, the cost of access export promotion is more visible to policy makers than those of import substitution. An export oriented development strategy generally entails relatively greater use of indirect, rather than direct, interventions; there is considerable evidence from individual studies that direct intervention may be considerably recognized. If there are significant indivisibilities of economies of scale, an export oriented strategy will enable firm to adequate size to realize them. If indivisibles and or economies of the scale are of importance an export oriented strategy will provide better incentives for expansion of capacity in existing lines. As such an import substitution strategy where form are generally limited in their horizons by the size of the domestic market.

Why is Economic Growth So Important?:

Since the middle of the eighteenth century human history has been dominated by the phenomenon of modern economic growth. In the eighteenth and nineteenth centuries economic growth had been largely confined to a small number of countries (Bairoch, 1993; Easterlin, 1996, Maddison, 2001). Gradually, modern economic growth spread from its origins in Great Britain to Western Europe and initially to overseas areas settled by European migrants (Landes, 1969, 1998). The dramatic improvement in living standards that has taken place in the advanced industrial economies since the industrial revolution is now spreading to other parts of the world. However, this diffusion has been highly uneven and in some cases negligible. The result of this long period of uneven growth is a pattern of income per capital differentials between the richest and poorest countries of the world that almost defies comprehension. The importance of economic growth as a basis for improvements in human welfare cannot be overstated and is confirmed by numerous empirical studies (see, for example, Dollar and Kraay, 2002a, 2002b) even small inter-country differences in growth rates of per capital income, if sustained over long period of time, lead to significant differences in relative living standards between nations. There is no netter demonstration of this fact than the impact on living standards of the growth experiences of the miracles East Asian economic compared with those of the majority of sub-Saharan Africa economics since 1960 by which time the decolonization process was well under way.

It is worth remembering throughout this discussion that the doubling time for any variable growing exponentially at an annual rate of 1 per cent is approximately 70 years. The so-called ‘rule of seventy’ says that if any variable grows at g per cent per annum, then it will take approximately 70/g years for that variable to double in value. More formally, this can be demonstrated as follows (Jones, 2001a). If $y_t$ is per capital income at time $t$, and $y_o$ some initial value of per capital income, then the value of $y_t$ is given by equation below

$$y_t = y_o e^{gt}$$

This equation says that if $y_o$ grows continuously and exponentially at a rate $g$, its value at time $t$ will be $y_t$ if one grew the length of time that it will take for per capital income to double (that is, for $y_t = 2y_o$) be $t^*$ will be the solution to the two equations below:

$$2y_o = y_o e^{gt^*}$$

$$t^* = \log 2/g$$

Since $\log 2 = 0.7$, then for a growth rate of 1 per cent, $t^* = 0.7/0.01 = 70$ years. We can generalize this relationship and say, for example, that any country which has per capita income growth of $g = 5$ per cent will see its living standards double in 70/g = 14 years. Thus the impact of even small differentials in growth rates, when compounded over time, are striking. Romer (1996) has expressed this point succinctly as follows: the welfare implications of long-run growth swamp any possible effects of the short-run fluctuations that macroeconomics traditionally focuses on; Barro and Sala-i-Martin (2003) also argue that economic growth… is the part of macroeconomics that really matters; a view in large part endorsed by Mankiw (1995), who writes that long-run growth is as important-perhaps more important-than short-run fluctuations.

METHODOLOGY

Method of Data Analysis:

A descriptive statistic method using tables, pie-chart, bar chart and trend chart was adopted, after which simple econometric regression analysis was used to estimate the relationship between economic growth and industrialization. The simple regression model entails the use of the hypothesis with test distribution table. Regression model, simple analysis was applied based on the estimates of parameter obtained in which the ordinary least square (OLS) would help to determine the estimated parameters. The
model of the study specified the relationship between economic growth and industrialization.

Model for this study was specified by adopting Cobb-Douglas production function which was captured in the Solow growth model with GDP as the output level depending on industrial output and industrial employment as follows:

\[ Y = f(INDPT, IEM) \]

This indicates that economic growth depends on industrialization (industrial output) and industrial employment (IEM), put in more formal economic way; it would be further expressed as:

\[
GDP = \beta_0 INDPT^{\beta_1} IEM^{\beta_2}
\]

Where \( \beta_0, \beta_1 \) and \( \beta_2 \) were the parameters of the model.

This model was linearized as follows:

\[
\ln \ln GDP = \ln \beta_0 + \beta_1 \ln INDPT + \beta_2 \ln IEM + \ln \epsilon
\]

Where:

- \( \ln \ln GDP \) is the natural logarithm of GDP which is the proxy for economic growth and development which is a dependent variable.
- \( \ln INDPT \) = natural logarithm of Industrialization proxy by Industrial output, which is an independent variable.
- \( \ln IEM \) = natural logarithm of Industrial Employment also an independent variable.
- \( \ln \epsilon \) is the stochastic variable (error term).

**A-Priori Expectation**

It is expected that \( \beta_0, \beta_1, \) and \( \beta_2 > 0 \)

**Diagnostic Test**

Diagnostic test conducted in this paper are ADF unit root test of stationarity, Breusch- Godfrey serial correlation LM test and Breusch-Pagan-Godfrey test of heteroskedasticity.

**DATA PRESENTATION AND ANALYSIS**

This section is concerned with the presentation of data and its analysis.

![Figure 1: Trend in GDP, industrial output and industrial employment in Nigeria](image)

The trend shows that the highest GDP recorded in 2013 (80,222.13) and the least recorded was 1,977.74 in 2001. The highest industrial employment was recorded in 2009 and the value was 991,352 while the least was recorded in 2010 with a value of 114,110. Industrial output reaches peak in 2012 with a value of 7,076.23 and recorded least in 2001 with the value of 105.15.
Table 4.2.1 contains general linear regression results for the growth effect of industrialization in Nigeria. The results indicated that the constant, coefficient of industrial output, and industrial employment were statistically significant. Precisely, the coefficient of industrial output and industrial employment were found statistically significant at 1 percent level, as indicated by their probability values of 0.0000 and 0.0004 respectively in table 4.2.1. The constant was found statistically significant at 1 percent as indicated by its probability value of 0.0069 which suggested that there are other variables that significantly and positively affected GDP but were not captured in this model. The coefficient of industrial output and industrial employment were rightly signed positive and consistent with the theoretical expectation of this study. The coefficients of industrial output and industrial employment were found positive suggesting that an increase in industrial output and industrial employment by one unit will raise GDP by 9.910633 units and 0.032653 units respectively as shown total 4.2.1. The F-statistics value of 114.4503, which is a measure of the joint effects of the explanatory variables, is found statistically significant at 1 percent level as indicated by the corresponding probability value 0.000000. This confirms the previous T-statistic test result. Therefore, we can conclude that both industrial output and industrial employment were significantly determining GDP in Nigeria.

The R² value of 0.9581 (95.81%) implied that 95.81 percent total variation in GDP was explained by industrial output and industrial employment. While, the goodness of fit of the regression remained very high after adjusting for the degree of freedom as indicated by the adjusted R² (R² = 0.9498 or 94.98%). The Durbin-Watson statistic 1.9775 in table 4.2.1 is observed to be higher than R² 0.9581 indicating that the model is non-spurious (meaningful), therefore the model can be useful for policy. The Durbin-Watson statistics 1.9775 is high, though less than 2 indicating the absence of/or negative autocorrelation.
Table 4.2.2 Double Log Results

Dependent Variable: log GDP
Method: Least Squares
Date: 05/24/15 Time: 11:18
Sample: 2001 2013
Included observations: 13

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Std. Error</th>
<th>t-Statistic</th>
<th>Prob.</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>11.89619</td>
<td>1.612423</td>
<td>7.377835</td>
<td>0.0000</td>
</tr>
<tr>
<td>LogINDP</td>
<td>0.533156</td>
<td>0.060965</td>
<td>8.745303</td>
<td>0.0000</td>
</tr>
<tr>
<td>LogIEM</td>
<td>0.466793</td>
<td>0.122400</td>
<td>3.813656</td>
<td>0.0034</td>
</tr>
</tbody>
</table>

R-squared 0.901747
Mean dependent var 10.02583
Adjusted R-squared 0.882097
S.D. dependent var 0.850740
S.E. of regression 0.292119
Akaike info criterion 0.575862
Sum squared resid 0.853334
Schwarz criterion 0.706235
Log likelihood -0.743101
Hannan-Quinn criter. 0.549064
F-statistic 45.88923
Durbin-Watson stat 1.473966
Prob(F-statistic) 0.000009

Source: E-Views 8 output

Table 4.2.2 contains general double log regression results for the growth effect of industrialization in Nigeria. The results indicated that the constant, coefficient of industrial output and industrial employment were statistically significant which confirmed the first linear result. Precisely, the coefficient of industrial output and industrial employment were found statistically significant at 1 percent level, as indicated by their probability values of 0.0000 and 0.0034 respectively in table 4.2.2. The constant was found statistically significant at 1 percent as indicated by it probability value of 0.0000 which suggested that there are other variables that significantly and positively affected GDP but were not captured in this model specified. The coefficient of industrial output and industrial employment were rightly signed positive and consistent with the theoretical expectation of this research. The coefficients of industrial output and industrial employment were found positive suggesting that an increase in industrial output and industrial employment by one percent will raise GDP by 0.533156 percent and 0.466793 respectively as shown in table 4.2.2. The coefficients of both industrial output and industrial employment were less than one (<1) which shows that industrial output and industrial employment changes more than change in GDP in the country for the period under review.

The R² value of 0.9018 (90.18%) implied that 90.18 percent total variation in GDP was explained by industrial output and industrial employment. While, the goodness of fit of the regression remained very high after adjusting for the degree of freedom as indicated by the adjusted R² (R² = 0.8821 or 88.21%). The Durbin-Watson statistic 1.474 in table 4.2.2 is observed to be higher than R² 0.9018 indicating that the model is non-spurious (meaningful), therefore the model can be useful for policy. The Durbin-Watson statistics 1.474 is very low and less than 2 indicating the presence of positive autocorrelation. This provides the basis for conducting Breusch-Godfrey serial correlation LM test, Breusch-Pagan-Godfrey heteroskedasticity test and unit root test.

4.2.3 Serial Correlation LM Test Result:

Breusch-Godfrey Serial Correlation LM Test:

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>Prob. F(2,8)</th>
<th>0.6695</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>1.240559</td>
<td>0.5378</td>
</tr>
</tbody>
</table>

The Serial Correlation LM test results contain in table 4.2.3 shows that there is no serial correlation between the error terms as indicated by the F-probability value of 0.6695 implying the acceptance of the null hypothesis of no serial correlation at 5 per cent significant level.

4.2.4 Heteroskedasticity Test Result:

Heteroskedasticity Test: Breusch-Pagan-Godfrey

<table>
<thead>
<tr>
<th>F-statistic</th>
<th>Prob. F(2,10)</th>
<th>0.7844</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obs*R-squared</td>
<td>0.616371</td>
<td>0.7348</td>
</tr>
<tr>
<td>Scaled explained SS</td>
<td>0.457313</td>
<td>0.7956</td>
</tr>
</tbody>
</table>

The Heteroskedasticity test results contain in table 4.2.4 shows that there is no heteroskedasticity in the model of this
paper, this implies that the variance of the error terms is constant as indicated by the F-probability value of 0.7844 implying the acceptance of the null hypothesis of no heteroskedasticity at 5 per cent significant level.

**Unit Root Test Result:**

- **Null Hypothesis:** D(GDP,2) has a unit root  
  **Exogenous:** Constant  
  **Lag Length:** 0 (Automatic - based on SIC, maxlag=1)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-5.105428</td>
</tr>
</tbody>
</table>

**Test critical values:**
- 1% level: -4.297073  
- 5% level: -3.212696  
- 10% level: -2.747676

- **Null Hypothesis:** D(INPT) has a unit root  
  **Exogenous:** Constant  
  **Lag Length:** 1 (Automatic - based on SIC, maxlag=1)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-3.643763</td>
</tr>
</tbody>
</table>

**Test critical values:**
- 1% level: -4.297073  
- 5% level: -3.212696  
- 10% level: -2.747676

- **Null Hypothesis:** D(IEM) has a unit root  
  **Exogenous:** Constant  
  **Lag Length:** 0 (Automatic - based on SIC, maxlag=1)

<table>
<thead>
<tr>
<th>t-Statistic</th>
<th>Prob.*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Augmented Dickey-Fuller test statistic</td>
<td>-3.490096</td>
</tr>
</tbody>
</table>

**Test critical values:**
- 1% level: -4.200056  
- 5% level: -3.175352  
- 10% level: -2.728985

The unit root results contain in table 4.2.5 shows that GDP is not stationary at level and at first difference but stationary at second difference and at 1 percent significant level as indicated by the probability value of 0.0033. Industrial output and industrial employment were found stationary at first difference and 5 percent as indicated by their probability values of 0.0262 and 0.0305 respectively.

**Test of Hypothesis:**

At the beginning of this paper, the following hypothesis were outlined

- **H₀:** Industrialization has no significant impact on economic growth in Nigeria.
- **H₁:** Industrialization has significant impact on economic growth in Nigeria.

Given the F-Statistic value of 114.45 and 45.89 in Table 4.2.1 and 4.2.2 respectively showed that industrial output and industrial employment were jointly and significantly affecting economic growth in Nigeria. The null hypothesis (H₀) above was rejected at 1% as indicated by the F-Statistic probability values of 0.000000 and 0.000009 respectively. In conclusion, therefore, industrialization has significant effect on economic growth in Nigeria.

**CONCLUSION AND REMARK**

Base on the results of this study, the importance of industrialization to economic growth cannot be overemphasized. In Nigeria even the import substitution industrialization strategy adopted from 1960 till present, have failed to achieve both internal and external balance because of lack of technological base and structural problem in particular. But with due consideration and proper implementation of all recommendation made as well as the transition from import substitution to export promotion, collaboration with the government and private sector, stable political climate and adequate infrastructural facilities which serves as a catalyst for industrial take off, the Nigerian economy will become like any other industrial economy of the world. Base on the result of this study we can conclude that industrialization will go a long way in stimulating economic growth in Nigeria. Based on the coefficient of industrial output (9.9106) in Table 4.2.1, increase in industrial output will increase economic growth. Precisely, 1 percent increase in industrial output will increase economic growth by 9.9 percent. This study therefore, recommended
that government and its relevant authorities should provide conducive investment environment by removing the structural rigidities that exist in the economy to encourage industrial activities. Government should endeavour to provide stable supply of power, good roads for transportation of goods and people, functional legal system, security of lives and property, infrastructural facilities etc. All these would boost industrial output thereby making goods and services readily available to meet the ever increasing demand in order to prevent inflation and subsequently lead to industrial expansion and improvement in economic growth of the economy. Based on the coefficient of industrial employment (0.0327) in Table 4.2.1; increase in industrial employment will increase economic growth. Precisely, 1 percent increase in industrial employment will increase economic growth by 0.03 percent. This study therefore, recommended the need to formulate policies to increase industrial employment which may likely improve the welfare of Nigerians, which would provide employment opportunities for the people. The coefficients of elasticities in Table 4.2.2 revealed the extent to which industrial output and industrial employment affects economic growth in Nigeria. It was found that economic growth was highly susceptible to change in industrial output given the elasticity coefficient of 0.5332 which is fairly inelastic and less susceptible to change in industrial employment given the elasticity coefficient of 0.4668 which is also fairly inelastic. This study therefore, recommended that more effort should be channel toward increasing industrial output than industrial employment.

REFERENCE

[2]. Anio, A.A.(1997);The Philosophy of Guided Deregulation; the Nigerian experience, paper present by the former honourable minister of finance at the university of Uyo.


Teriba and Kayode (1977) Industrial development and prospect Ibandan University press.


<table>
<thead>
<tr>
<th>Year</th>
<th>GDP at current market price (Billion Naira)</th>
<th>Industrial output (₦ Billion Naira)</th>
<th>Industrial employment in thousand IEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>6,895.20</td>
<td>105.153</td>
<td>197,739</td>
</tr>
<tr>
<td>2002</td>
<td>7,795.76</td>
<td>132.554</td>
<td>292,393</td>
</tr>
<tr>
<td>2003</td>
<td>9,913.52</td>
<td>1,248.94</td>
<td>283,501</td>
</tr>
<tr>
<td>2004</td>
<td>11,411.07</td>
<td>927.26</td>
<td>276,567</td>
</tr>
<tr>
<td>2005</td>
<td>14,610.88</td>
<td>1,059.69</td>
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<tr>
<td>2006</td>
<td>18,564.59</td>
<td>2,472.26</td>
<td>482,219</td>
</tr>
<tr>
<td>2007</td>
<td>20,657.32</td>
<td>3,044.91</td>
<td>548,799</td>
</tr>
<tr>
<td>2008</td>
<td>24,296.33</td>
<td>3,212.38</td>
<td>779,567</td>
</tr>
<tr>
<td>2009</td>
<td>24,794.24</td>
<td>4,589.70</td>
<td>991,352</td>
</tr>
<tr>
<td>2010</td>
<td>54,204.80</td>
<td>4,610.08</td>
<td>114,110</td>
</tr>
<tr>
<td>2011</td>
<td>63,258.58</td>
<td>6,090.55</td>
<td>146,108</td>
</tr>
<tr>
<td>2012</td>
<td>71,186.53</td>
<td>7,076.23</td>
<td>165,210</td>
</tr>
<tr>
<td>2013</td>
<td>80,222.13</td>
<td>5,887.34</td>
<td>123,654</td>
</tr>
</tbody>
</table>