Industrialization in Nigeria: In-country Capital Goods Manufacturing

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ABSTRACT

Industrialization is fundamental towards advancement in economic growth and development of a country. Capital goods are key to industrial operations and expansions leading to economic transformation. This paper offers a concise submission on industrialization with focus on capital goods, looking at the case of Nigeria. Overview of capital goods as well as good practices and success stories around the world have been showcased. Follow-up measures towards industrialization in Nigeria in line with capital goods focus has been successfully offered. This comprises of some exemplary capital goods to target, policy measures, social security inputs, and lastly energy access and diversifications with security in view of sustainability in productions. With such measures in place, industrialization is achievable in Nigeria with enormous success stories.

Keywords: Industrialization; Capital Goods; Energy Access; Economic Transformation; Nigeria

INTRODUCTION

Industrialization is understood to be a strong key to unlocking the economic growth, development and transformation of any country globally. The Industrial Policy of Nigeria, which was made public in 1989, aims to make the industrial sector the main source of strength of its economy with the following elements as reported by [1]:

- Provision of greater employment to Nigerians
- Increased exports of manufactured goods
- Promotion of industrial development and national integration through industrial dispersal
- Improvement of the nation's technological capacity
- Increasing local content of industrial outputs to promote enhanced linkages and backward integration
- Attracting direct foreign investment
- Increased private sector participation

Furthermore, numerous policies and actions have been taken by Governments over the years to support industrial development in Nigeria, which included the Nigerian Indigenization Policy (NIP) of 1972-77, Structural Adjustment Program (SAP) of 1986, Trade and Financial Liberalization Policy (TFLP) of 1989, establishment of the Bank of Industry in 2000, National Economic Empowerment and Development Strategy (NEEDS) of 2004, and the Nigerian Industrial Revolution Plan (NIRP) of 2014.

It is crucial to specify the fact that the economy of Nigeria has been described as middle-income, mixed economy and emerging market with expanding manufacturing, financial, services, communications, entertainment sub-sectors and lots more. As far as the economic indicators are concern, Nigerian gross domestic product (GDP) was estimated in 2022 as $ 472.62, which led to a per capita value of $ 2,163 while being the 33rd strongest economic in global ranking [2]. Regarding the sectorial contributions to the GDP value, services being the highest in share contributed about 44.04%, leaving agriculture and industry with 23.69% and 30.78% respectively [3]. In spite of all these outstanding records, only 3 subsectors in the

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industrial or manufacturing domain accounts for the 77% of the manufacturing activities of the country. The subsectors are food and beverages, cement, and textiles. There is basically nothing in terms of new manufacturing techniques with also no local Capital Goods production.

Further inputs regarding the capital goods on the global concern showed only few countries produce most of the capital goods, however, poor country lacking economic philosophy and technical knowhow are the major importers of the capital goods and major exporters of intermediate goods [4]. Also, the dependence on capital goods supply further depends on a country's level of income, which is ultimately linked to the gross domestic product value. It can be logically stated that the ratio of import to production of capital good is a strong measure in determining the economic power of a country. High production to import ratio shows strong economy and vice versa.

Numerous studies on industrialization have been conducted around the world, as efforts to economic development and transformation. Franck and Galor [5] conducted a study on industrialization and long run development. The study focussed on technological impact and its associated driving and hindering factors on the French economy basing on short run and long run distinctions. The role of industrialization on economic growth based on Senegal experience has been studied by Ndiaya and Lv [6]. The authors utilized numerous data sets for a period of 1960 – 2017, coupled with robust statistical analysis in establishing the relationship between industrial outputs and economic parameters. Xu et al. [7] researched on the impact of industrialization and urbanization on carbon emission intensity of energy consumption for the case of China. The study employed statistical analysis on the linkage of industrialization, urbanization and social affairs, energy consumption and carbon emissions. The effect of industrialization on climate change has been studied by Wadanambi et al. [8]. The study focussed on Sri Lanka's experience based on its industrial contributions of greenhouse gases for some selected industries, with mitigation strategies proposed.

Finally, this paper is aimed at providing intellectual submissions for industrialization based on capital goods focus in the Nigerian context. It is however structured into sections namely: section 1 – introduction, section 2 – overview of capital goods and major producers, section 3 – major requirements for in-country capital goods manufacturing in Nigeria, and section 4 - conclusion

OVERVIEW OF CAPITAL GOODS AND MAJOR PRODUCERS

According to [9], Capital Goods are tangible assets used by companies to produce consumer goods and services. Capital Goods include buildings, machinery, equipment, vehicles and tools. Capital Goods are not finished products or what is termed consumer goods from the definition provided. Hence, the consumer goods are the end products of the production and manufacturing process. Further point implied consumer goods to be low-cost items as contrary to capital goods being usually involving investments of large sum of money. The more a country invests in its capital goods the stronger its economy and GDP.

Capital goods are durable products used to produce other products and services. Examples include:

- Production technology: Machines like robots, farm equipment or kitchen appliances in a restaurant that are directly used in production of products and services.
- Vehicles owned by a business are capital goods but those owned for personal uses are consumable items.
- Computing equipment and infrastructure such as networking equipment for use in a firm are capital goods.
- Electronics such as cameras and videos used by a film crew are capital goods.
- Power system technologies such as gas turbine plants or solar modules and the balance of system components powering a business are capital goods.
- Infrastructure like private roads to a factory or business premises are capital goods.
- Facilities like buildings and data centres used by businesses are capital goods.
- Furniture, fixtures and office equipment used by businesses are capital goods.
- Construction tools or machine tools used by production firms are capital goods.

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- Instruments used for industrial quality control and musical instruments used by a musician are capital goods.

Linked up to the capital goods is the capital good sector, which according to [10], it is also referred to as the industrial sector, and a category of stocks related to manufacturing and distributing of goods and services. The sector is obviously diverse, comprising of different companies with the sole target of capital goods manufacturing, consultancy services, with research and development (R&D) for improvements. It must be noted further that the capital goods sectors are impacted in a number of ways in the country they are located. Part of the impact has been on the nature of a country's budget and areas of priority, which ultimately results in high demand for any aspects or resources or assets linked to the priority area and hence more order for such assets at the capital good sector associated. The operations of a capital good sector is also understood to have environmental impact, hence proper choice of approach and deals are necessary in view of abating the fear of climate change with its devastating impacts.

As far as the manufacturers of capital goods are concern, the top 10 manufacturing nations in the world on Capital Goods sectorial activities ground have been sourced, and with their shares of the global total presented for the year 2019. They have been classified in table 1 as follows:

Table 1: Top 10 Manufacturing Nations on Capital Goods Basis in 2019 [11]

Country	**Share of the World Manufacturing (%)**
China	28.4
United States	16.6
Japan	7.5
Germany	5.8
India	3.3
South Korea	3.0
Italy	2.3
France	1.9
United Kingdom	1.8
Indonesia	1.4

It must be noted that other countries in descending order of their percentage contribution of manufacturing outputs include: Russia, Mexico, Canada, Ireland, Spain, Brazil, Turkey, Switzerland, Thailand, Netherlands, Poland and Saudi Arabia. Furthermore, economic analysis have been observed of different regions around the world for the cumulative monetary value for the export and import of the capital goods with their respective production shares. Table 2 provided the details of such financial assessment.

Table 2: Regional Import and Export Analysis for Capital Goods in 2021 [12]

Region	**Export (USD)**	**Import (USD)**	**Export Share**	**Import Share**
East Asia and Pacific	2.70 Billion	3.48 Billion	41.20	46.97
Europe and Central Asia	2.46 Billion	2.02 Billion	27.71	25.27
North America	1.33 Billion	622.11 Million	34.85	28.02
Latin America and Carribean	435.71 Million	299.07 Million	32.75	22.82
Middle East and North Africa	327.15 Million	54.92 Million	27.34	5.05

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Furthermore, the evolution or trend as per investment in capital goods, with focus on machinery and equipment has been presented in figure 1. The data shows the cross-country median values of the real investment in machinery and equipment to real GDP ratio for emerging markets and developing economies.

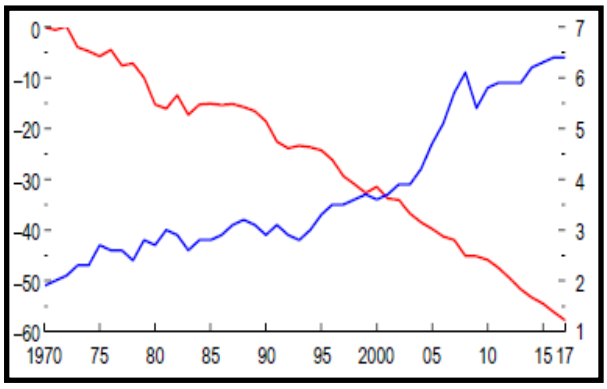

Figure 1: Evolution of the Relative Price of Machinery and Equipment and Investment Rates around the World [13]

The information in figure 1 as a strong economic indicator for emerging markets having presented in a trend wise manner showed the simultaneous inverse proportional rising and falling of the investments and prices of the specified capital goods over the past years. This is a clear evidence that successive and enhanced investments in capital goods resulted in positive change in the price data as a strong economic breakthrough. This could be linked to enhanced research and development practices on the capital goods in view of cost effectiveness and efficiency. Hence basing on the Nigerian context, it should serve as a wake-up call towards such considerations as a strong economic driver, ultimately accelerating the research and development practices with more success stories in that direction. Nigeria is a big market with enormous potentials.

MAJOR REQUIREMENTS FOR IN-COUNTRY MANUFACTURING OF CAPITAL GOODS IN NIGERIA

To complement on the existing points, for Nigeria to industrialise in view of boosting its economic growth, development and transformation, it must commence arrangements for the local production of the following Capital Goods within the country:

a. Heavy electrical machinery
b. Process plant equipment
c. Earth-moving and mining machinery
d. Printing machinery
e. Food processing machinery
f. Dies, moulds and press tools
g. Textile machinery
h. Machine tools
i. Plastic machinery
j. Metallurgical machinery

The listed 10 capital goods are not exhaustive but can be taken as the first phase of the initiative. Two or three of the countries with strong base in the manufacture of capital goods could be approached to set up their plants in Nigeria. The Nigerian plants will commence as assembly plants but with increasing local contents as raw materials are obtained locally.

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To expand further, the evolvement of a solid in-country Capital Goods industry in Nigeria will require a robust "National Policy on Capital Goods". The policy should include partnership with advanced nations, and investment schemes as well as the associated legal and regulatory frameworks.

Other aspects of consideration are as highlighted below for progress:

There is need for significant improvement of current security situation in the country so that investors, especially from abroad, will come to Nigeria. In line with such, there is need for the speedy elimination of the menace of terrorism, insurgencies, banditry, kidnappings and unknown gunmen. This can be achieved via the following measures:

- Political will by the government to faddress the security challenges is very fundamental.
- Effective border security and surveillance in avoiding unknown personnel inflow to the country is necessary
- Intelligence on information gathering and communication tracking is essential
- Enhanced supply of modern and sophisticated weapons for better preparedness of the security forces

The next major requirement for a solid Capital Goods sector in Nigeria is the availability of stable and reliable electricity supply which can be realized by:

- Strengthening the sales agreement of the 17 privatized electricity entities with some much needed reviews.
- Integrating the vision 30-30-30 for power with the Siemens Roadmap for Power.
- Significant expansion of the energy mix for electricity supply to include more renewable and alternative energy sources.
- The use of embedded power plants to bridge the demand-supply gaps at municipalities that are heavy load centers.
- The use of off-grid and mini-grid plants for locations far away from the national grid.
- Implementation of the 'willing buyer willing seller' policy.

Other solid minerals and composites are also needed for the Capital Goods industry in the country and they can be secured from the excellent endowment of the nation by serious encouragement of the setting up of several open-cast and underground mines and mineral processing plants with the following considerations:

- They should be based on the solid mineral endowments of various states of the Federation.
- Mineral processing plants will add significant export values to the mined ores.
- Public Private Partnerships (PPP) is inevitable. – This can take an investment ratio of 60:40, such that 60% goes to the private sector and 40% goes to the government in ensuring a well disciplined approach and lowering the chances of corruption. Also, appropriate and favorable fiscal and monetary policies are necessary for better participation of the private sector. This should cover favorable tax credits on importations and exportations, and proper grants considerations for the geological researches and implementation activities on the solid mineral affairs.
- There is need to checkmate the sporadic illegal mining activities all over the nation.
- Automation, which will be a key component of efforts to reviving domestic manufacturing, will create many new job opportunities for ICT competent workers.
- A digitally enabled workplace with e-commerce platforms
- A continuing demand for skilled talent in the manufacturing sector.
- A greater demand for engineers, automation experts, digital specialists and e-commerce executives as the manufacturing sector gains momentum in Nigeria.

CONCLUSION

The paper offers a comprehensive and substantial submission on the industrialization measures in the case of Nigeria, with strong focus on capital goods as a major driver while also linked to sustainable power supply.

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Several concerns were discussed and a number of recommendations for the nation's economic growth and development were provided. Hence, the following points are finally noted:

- The major requirement for Nigeria to become an industrial nation is that it must be able to produce, within the country, the range of Capital Goods that are needed by several manufacturing sub-sectors.
- This will require the adoption of a sound policy as well as legal and regulatory frameworks in addition to partnership with some advanced nations to promote the local production of Capital Goods.
- It will also be necessary to:
- Significantly strengthen the security situation in the country
- Ensure stable and reliable electricity supply throughout the nation
- Complete the steel projects at Ajaokuta and Aladja
- Ensure the extraction of the numerous solid minerals needed for production of Capital Goods by actively encouraging the establishment of both open-cast and underground mines and mineral processing plants around the country.
- The production of capital goods in Nigeria, will within a few years, make it the leading manufacturing nation of Africa even on per capita basis.
- This will place Nigeria in a vantage position to maximise economic gains from the African Free Trade Continental Agreement.
- H.R.M. Engr. Otis Anyaeji and the President of the N.S.E. should appoint a team to prepare the blueprint, for the Government, on the pragmatic strategies for in-country production of Capital Goods for the purpose of fast-tracking Nigeria's industrialisation.

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Authors Contribution

- Conceptualization and Analysis – ASS
- Original Draft Preparations – IAJ and ASS
- Extra Inputs – IAJ and MM
- Review, Corrections and Overall Supervision – ASS and MM

Numenclature

GDP – Gross Domestic Product
ICT – Information and Communication Technology
HRM – His Royal Majesty
NEEDS – National Economic Empowerment and Development Strategy
NIP – Nigerian Indigenization Policy
NIRP – Nigerian Industrial Revolution Plan
NSE – Nigerian Society of Engineers
PPP – Public Private Partnership
SAP – Structural Adjustment Program
TFLP – Trade and Financial Liberalization Policy
USD – United States Dollars

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