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PRODUCTIVITY FOR ECONOMIC RECOVERY AND SUSTAINABLE GROWTH

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Abstract

This paper presents the major productivity challenges facing Nigeria as a nation which contributed to delays in her economic recovery process. Some industrial visits were made to ascertain the effective levels of productivity, while administering structured questionnaire for data gathering. Comparative analysis was done between countries which were also categorised according to their developmental levels and strategies. Nigeria was included in the analysis, with a view to knowing where we belong and how best to fashion a way out of recession to achieve economic recovery. Results showed that corruption has eaten deep into the fabrics of our economic development. Manufacturing industries were found to be shutting down, due to unfavorable international competitiveness. One major way out of our recession was the development of human resources and creation of a stable macroeconomic environment. Also, Nigeria has to develop further its research and development activities through the allocation of more Research and Development expenditure as percentage of GNP particularly industrial research, in order to become competitive in the international market.

Keywords: Productivity; Recession; Challenges; Economic Recovery; Growth.

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1. Introduction

No nation has been called great without consistent growth in productivity. Creativity and innovation have no place if they do not find use in developing the economy. Also, any growth not traceable to productivity increases cannot be said to be sustainable. Globally, it has been proved that Productivity is a generic term used to express the way people live. It is also an expression of the attitude of a people in relation to the quality of goods and services rendered. Operating from mathematical point of view, we know that productivity is a ratio of output over input.

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Hence, Productivity, P = $\frac{\text{Output}}{\text{Input}} = \frac{\text{Input-waste}}{\text{Input}}$……. (1)

Extending the above model to waste management,

$$P = \frac{\text{Input} - \text{waste}}{\text{Input}} = \frac{i - x}{i}, \text{ where } i = \text{input and } x = \text{waste}$$

This model also holds, as x tends to zero. Managing the waste therefore means that every effort should be made to bring the value of x to the lowest, if not zero. This x, exists in every man-machine system.

This x also represents risk. Thus when we operate at high risk, we tend to reduce our productivity. Specifically, in agricultural activities where the Governments are given priority, we have colossal losses yearly. Food will always be scarce, as long as we neglect waste management and loss control. According to Ekumankama (2017), agricultural produce abounds in Nigeria. Notable among them are:-

- **Cereals** – Rice, Corn, Millet, sorghum, wheat, barley, etc.
- **Legumes** – groundnut, cow pea/beans, pigeon pea, African yam seed, barabara nut (okpa), African bread fruit (ukwa), etc.
- **Roots and Tubers** – Cassava, yam, potatoes, cocoyam, ginger, carrot, etc.
- **Fruits and vegetables** – Orange, pineapple, mango, water melon, pawpaw, okra, cucumber, plantain, spinach, pumpkin, tomatoes, cabbage, lettuce, banana, etc.
- **Fats and Oil** – Palm fruits, melon, groundnuts, soya beans, palm kernel, etc.
- **Nuts** – cashew, pea nut, almond, dates, walnut, tiger nut, etc.
- **Spices** – Locus beans, uzizi, utazi, uda, curry, nutmeg, turmeric, garlic, ginger, Onions, etc.
- **Animals/Fishes** – Sheep, Goat, cow, rabbit, snail, grass cutter, birds/poultry, pig, fishes, shrimps, etc. All these are suitable for establishment of cottage industries respectively.

In agriculture, engineering has a lot of solutions to the management of waste. These solutions were built in the design of various techniques used to preserve products, depending on the nature of the produce. They include:-

- Silos – for grains such as rice, corn, beans, sorghum, etc.
- Barns/cages – for roots and tubers.
- Cold stores – for animals and fish products.

Further, the engineering management of waste and loss control in agriculture, above products were being processed into numerous value-added products capable of being stored for longer period of time while remaining wholesome, namely:-

- **Cassava** – Garri, flour, odourless fufu, starch, alcohol, etc.
- **Corn** – Flour, corn meal, flakes, starch, pap, alcohol, etc.
- **Beans** – Flour, roasted/fried beans, etc.
- **Rice** – Flour, rice crisps, etc.
- **Yam** – Chips, flour etc.

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- **Potatoes** – Chips, flour, etc.
- **Plantain** – Flour, chips, blocks, etc.
- **Animal and fishes** – dried fish, canned, packaged, seasoned (kilishi)
- **Tomatoes** – juice, puree, powdered, etc.
- **Fruits** – Juices, wine, concentrates, etc.
- **Coconut** – Milk, flakes, oil, candies, biscuits.
- **Animal**/P**lant Waste** – Feed, fertilizer, etc.

In manufacturing, we manage waste through effective control of value of waste such that quality is at the increase with productivity. In administration, over- invoicing, bribery and corruption are areas of waste which is manageable when we consider value of 'x' for reduction. In timing, because this is the only irrecoverable input resource, operating on schedule is the only approach to its management and control. In labour, human factors engineering ensures that good work ethics, effective employment procedures promote industrial harmony and enhances productivity.

Given Nigeria's current efforts at transforming both the society and the economy; all hands must be on deck. However, it is doubtful if the economy can be transformed without the requisite technological manpower. Given that the Nigerian Society of Engineers has registered slightly above 50,000 members, it is no wonder that the per capital ratio of engineers in the population is minuscule and probably inconsequential. There is a need to encourage more students to opt for the engineering and other technically related courses. This will ensure that any strides in creating wealth and improving the economy will be sustainable. The same encouragement should be given to increasing the pool of industrial engineers for the obvious push required in boosting productivity.

Perhaps at this stage also, the Federal Government needs to go beyond the annual productivity awards to individuals. While the awards have encouraged individual efforts in boosting productivity, indeed very little have been achieved at corporate and sectoral levels. There is therefore a system-wide effect which remains missing. This can be engendered by instituting productivity policies that make it mandatory that corporate bodies have productivity measurement and improvement schemes. Reward systems can then be put in place to encourage those who consistently improve productivity.

Economic recovery, is the phase of the business cycle following a recession, during which an economy regains and exceeds peak employment and output levels achieved prior to downturn. Growth.

The future of any nation does not only depend on the vast natural resources it possesses, but the specialized engineering skills, competence and the ability of its inhabitants to exploit these resources. Engineering is the foundation of technological and infrastructural development of any country. It is worthy of note that, the current technological innovations in the world are possible because of the trained personnel in the field of engineering and technology (Adegbuyi and Uhomoibhi, 2008). However, Byers (2013) argue that it is no longer sufficient for engineering students to graduate with only technical education; engineers need to have entrepreneurial skills.

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The relevance of the human resources was brought to the fore for a breakthrough. The development and rehabilitation processes focused on the following key solid minerals: coal, petroleum, gypsum, kaolin, barites, salt, diatomite and bentonites as huge opportunities in this sector which nature has been kind enough to endow Nigeria with. These are basic areas of industrial growth.

The role played by the newly industrialized countries (NICs) such as China in the major world center of international market and trade cannot be over emphasized. The diversity of these countries in some overall economic indicator such as per capita income, natural resources and the process of their industrialization, can be helpful for developing countries like Nigeria with similar characteristics to pursue their technology development strategies.

To achieve this, the less developed countries could increase their productivity level as well as managerial and technological expertise by adopting appropriate macro policies for technology transfer and industrialization. They can also manage successfully to decrease their technological gap with the more technologically advanced countries through a catching up process (Narula and Sadowski, 2002). Although there are some differences in the stage of development, size of economy, resource endowment etc, but the industrial and technological development of Less Developed Countries (LDCs) have been of interest, in particular those which attempt to promote their technological capability through the same pattern of rapid industrialization (Archibugi and Coco, 2002). Moreover, the analysis of industrialization experience of newly industrialized countries like China may assist the policy makers in Less Developed countries in an understanding of the development process. The success of China shows that there has been major diffusion of world technology in progress, (Krugman, 2014).

Table 1: Factors for Technology Globalization percentage rating per Country

	Country	
Factor	NICs	LDCs (Nigeria)
Macroeconomic stability	89	11
Human resources development	85	15
Industrial and technological capability expansion	90	10
Effective and supportive government role	88	12
Export promotion	95	5
Research and development	95	5

The above shows the summary of the survey data, which represents the factors for technology globalization.

Macroeconomic Stability/Human Resources Development

Newly industrialized countries (NICs) such as China have adopted an appropriate and effective technology globalization strategy which has been supported by some other policies including development of human resources and creation of a stable macroeconomic environment.

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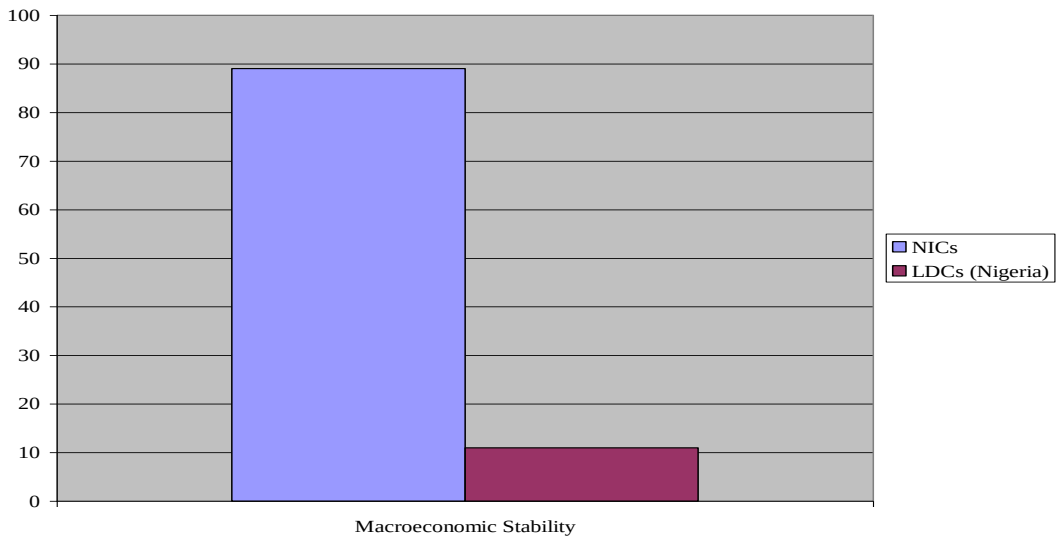

Figure 1: The level of Macroeconomic Stability

This shows that adoption of macroeconomic stability is 89% for NICs against 11% for LDCs.

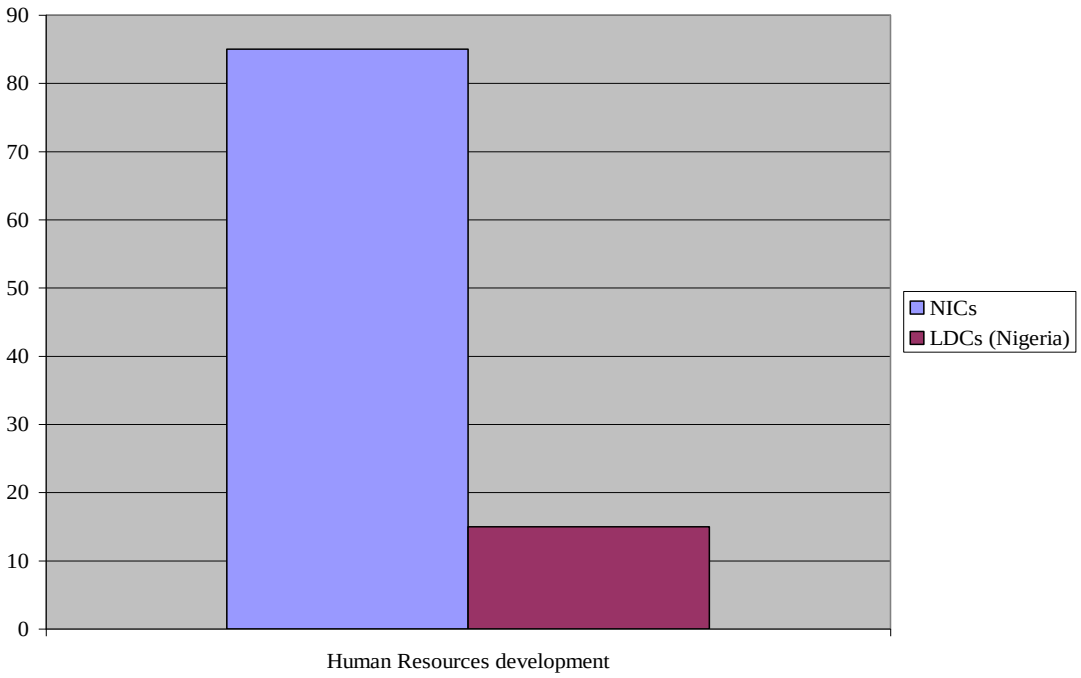

Figure 2: Human Resources Development

The above figure shows that human resources development is about 85% for NICs and 15% for LDCs.

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Export Promotion

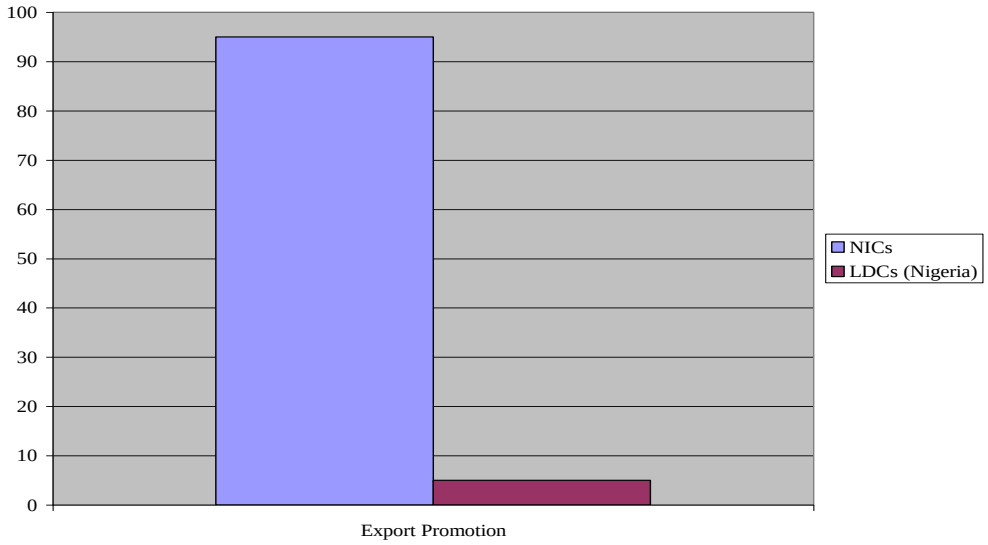

Figure 3: Export promotion Policy

Figure 3 shows that adoption of an aggressive export promotion policy in most of the Newly Industrialized Countries (NICs) accelerated the flow of foreign investment and technologies, which brings rapid integration of their economy to the world economy.

Research and Development Activities

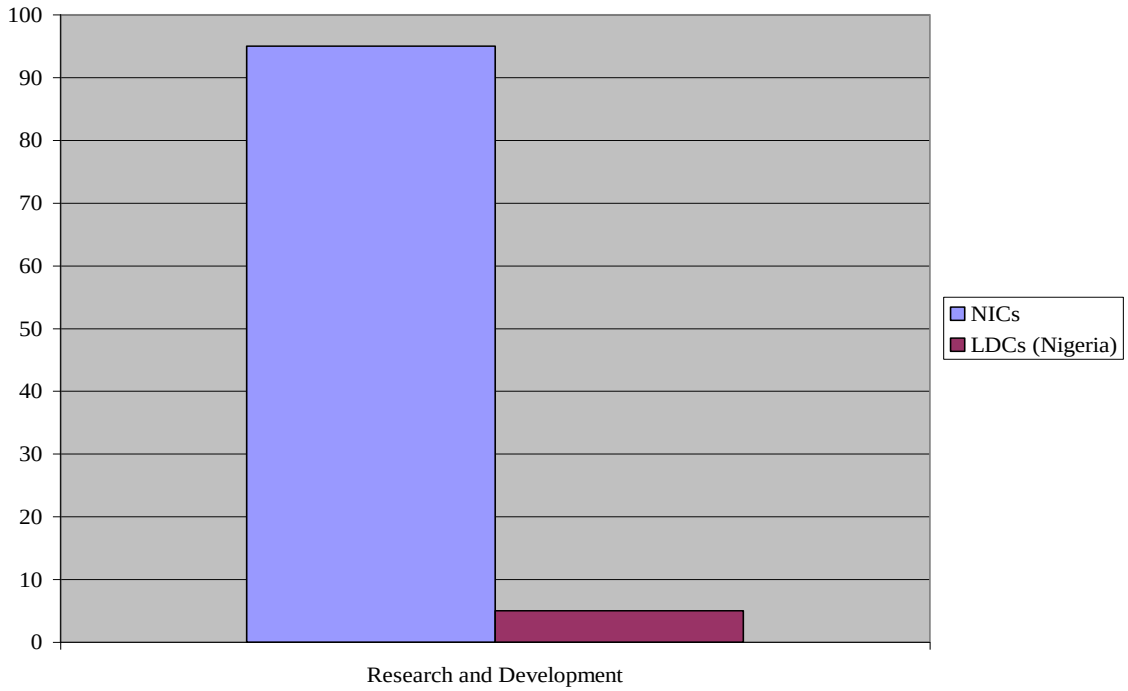

Figure 4: Research and Development Activities

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Figure 4 shows that adoption of research and development activities in NICs played very important role in the promotion of their indigenous technological capability as well as absorptive capacity for importing advanced technology which led to successful technology globalization in their countries.

The adoption of effective policy measures including outward looking strategy, designing specific programs for developing indigenous technological capability as well as massive importation of technology and expansion of a well-skilled and qualified workforce are the most important reason for the China's success story.

2. Conclusion

The productivity of any nation is assessed by the level of losses encountered in the activity process. When losses / wastes are reduced or effectively controlled in every man-machine system, productivity will be improved. This will lead to recoveries and growth in the economy.

3. Recommendations for Nigeria

Having analyzed the key success factors of technological globalization in Newly Industrialized Countries like China, one can draw some general lessons and recommendations for Nigeria, which decide to pursue the similar pattern of technological globalization and development. One of the major lessons that Nigeria government can learn from China's experiences is that they have adopted an appropriate and effective technology globalization strategy which has been supported by some other policy measures including development of human resources and creation of a stable macroeconomic environment.

Moreover, the adoption of an aggressive export promotion policy in Chain accelerated the flow of foreign investment and technologies in this country and also the rapid integration of the economy to the world economy. These policies have also been very effectively implemented through the key factors and flexible role of the government. Therefore, there is an essential need for Nigeria government to design and formulate an appropriate technology globalization policy based on its overall national development strategy aiming at the development and promotion of indigenous technological capability as well as the adoption and absorption of imported technology and customizing it for local market. Nigeria can be more successful through a catching up process that does not need to reinvent the wheel. Therefore, it can be generally said that Nigeria may also achieve similar and even better results if they pursue the same model and a set of appropriate policies which have previously been experienced by China or other Newly Industrialized Countries.

The experience of China in rapid industrial and technological development can also provide valuable lessons for Nigeria. Improvement in management of technological development capabilities in Nigeria has been for long time the centre of policy concern in Nigeria. The policy and decision makers in Nigerian industrial sectors have been well aware that the key to long-term economic growth and technological progress lies in designing and implementing effective national technology development policy. In other words, the country has been in great need of some effective policy measures to promote indigenous technological capability and stimulate local

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inventive and innovative activities. In this respect, more emphasis has been placed on the adoption of policies concerning effective cooperation with university and Research and Development Centers and proper technology transfer mechanisms to promote innovation capacities of the country.

It seems essential for Nigeria as a country that is highly dependent on the oil revenues, to emphasis more on the expansion of non-oil exports through the greater emphasis on the export promotion policy. This is mostly because the country cannot rely on oil revenues in the long term as the main source of foreign exchange due to newly developed technologies, declining oil resources and prices. Therefore, the development of a non-oil export sector capable of replacing the oil income is very important for the long-term and overall prosperity of the country. Moreover, as the experience of China in the implementation of export promotion policies shows, it would be better for Nigeria to strengthen primarily those industries and areas in which it has already comparative and competitive advantage, such as labour-intensive and resource-based industries as well as some of its traditional handicrafts, such as wood carving. In the later stage, it will be necessary to develop some of its high-tech and capital intensive industries.

The experience of China in research and development activities shows that Nigeria has to develop further its research and development activities through the allocation of more Research and Development expenditure as percentage of GNP particularly industrial research, in order to become competitive in the international market. The government in China has also played a very important role in technological globalization by providing effective and stable macroeconomic environment. The government in this country can be characterized as strong, efficient, market friendly, and relatively less interventionist. The government in this country also changed the previous policies very quickly when they found them to be ineffective. The government in Nigeria, can also effectively be involved in such a features as identification of the country's potential capacities and needs, formulation of appropriate policies for science and technology development and their goals and objectives, recognition of priorities and designing a set of appropriate policy measures needed for successful industrial and technological development. The government can also play an important role in the rapid transition to an export oriented policy and rapid integration of local economy to the world economy. The role of government during this transition period towards a more outward-oriented economy is to use the country's oil based resources to improve an infrastructure network needed to improve the industrial products capable of competition in international markets. Moreover, the government should also implement appropriate policy measures to train adequate technicians and engineers for a successful absorption of imported technology. It will be better if government can invest in those industries in which the private firm may be reluctant to invest.

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