

# **Triple Helix Model: Panacea for fast tracking Economic Growth and Industrialization of Nigeria**

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**Abstract:** Gross domestic product (GDP) is the standard measure of the value of final goods and services produced by a country during a period. Though it does not show how happy or sad the people in the country are, it is nonetheless a fair assessment index of the level of economic activities and financial flow amongst the citizens of the country. Industrialization aims at enhancing the massive productions of goods and services in a country, thereby increase the GDP resulting in better wellness of the country. For goods and services production in a country to impact positively on the economy, the goods and services produced must be need-driven, qualitative and globally competitive. Knowledge drives the production and utilization of goods and services and as such countries that have advanced in knowledge achieve enhanced GDP. Their products find markets in all the parts of the World. The knowledge plant in every country is the academia as it continuously studies existing knowledge by reading, analyzing and experimentations transforming them into new knowledge to further advance production of novel need-driven products and services thereby further improving their GDP. This is achieved through a working relationship between the Academia and Industry supervised by the Government. This paper is an advisory script for the employment of the Triple Helix Model to fast-track the industrialization of Nigeria leading to great economic growth, enhancement of GDP and the general wellness of the citizenry. The paper posits that the implementation of the Triple Helix Model would enable Nigeria to shift from being a goods consuming country to a knowledge based developed economy.

**Keywords:** GDP, Industrialization, Academia, Government, Triple Helix

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## **I. Introduction**

Three organs of an economy whose activities and their interplay directly impact on the economic growth of any country are the Government, the Industry and the Academia. Government here implies government at the three tier, the local, state and federal. The roles they play are directly responsible for the growth or decline of a country's economy. Industry include all business entities engaged in the production of goods and services on which the economy thrives. Large scale industries and multinational companies, micro, small and medium scale industries all make up the industry. Each is important in its own rank. Promotion of industry activities ensures economic growth. The Academia consists majorly the University alongside its adjutants namely the Polytechnics and other vocational and professional institutions above secondary school level as well as research institutions which concentrate on the second role of Universities which is research and development (R&D). Knowledge is the currency for industry emergence, growth and proliferation. Lack of knowledge or its misappropriation or underutilization in industry is inimical to economic growth. These organs are discussed further.

### **Universities**

The universities are schools of education, and schools of research. But the primary reason for their existence is not to be found either in the mere knowledge conveyed to the students or in the mere opportunities for research afforded to the members of the faculty. So far as the mere imparting of information is concerned, no university has had any justification for existence since the popularization of printing in the fifteenth century. The justification for a university is that it preserves the connection between knowledge and the zest of life, by uniting the young and the old in the imaginative consideration of learning. The university imparts information, but it imparts it imaginatively. At least, this is the function which it should perform for society. A university which fails in this respect has no reason for existence. This atmosphere of excitement, arising from imaginative consideration, transforms knowledge. A fact is no longer a bare fact: it is invested with all its possibilities. It is

no longer a burden on the memory: it is energizing as the poet of our dreams, and as the architect of our purposes (Whitehead, 1927).

Knowledge transformation creates new knowledge and the continuous knowledge dissection, analysis and synthesis in fresh platforms generate new useful knowledge which can be deployed for economic development. Traditionally, universities hold the key to knowledge, in both a physical and philosophical sense. University libraries, laboratories, workshops, faculty domains and research institutes are where knowledge is created, stored and shared. The members of the university who work in these domains typically hold a privileged status as originators and keepers of knowledge. Universities and polytechnics have long been important economic drivers in their surrounding communities, and their potential impact on the wider, regional economy has been growing dramatically (Porter, 2007). As conspicuous as the economic impact of universities are in developed countries where strings of inventions and new creations that make the internet world today emanate, the economic impact of higher institutions in Nigeria and other developing countries have been hitherto limited to the production and supply of requisite manpower to the workforce. Even much of the valuable input to the workforce still come from company or agency internship trainings and mentorships in the form of one apprenticeship or the other.

The universities are sources of two most valuable assets for economies: educated skilled people, and new ideas. Through their teaching, universities disseminate knowledge and improve the stock of human capital; through the research they perform, universities extend the horizons of knowledge; and by their third-mission activities, they transfer their knowledge to the rest of society, work with industry and create the seeds that lead to new companies. While this third stream of activities builds upon the first (education) and second (research), it has not been 'core' in the same way as the first two streams of university activity. However, these 'third stream' or 'third mission' contributions are increasingly seen as important and distinctive in their own right, deserving of specific policies and resources to ensure their effective functioning (Veugelers and Rey, 2014). While universities are a key sector partner to the Industrial Strategy through their education exports, there is so much more universities can do to drive economic growth. Apart from the direct commercialization of their own research, innovations generated through business-university collaboration are critical to growth in new businesses and driving efficiencies and value in existing businesses. Nowadays, universities are demanded not only to play an active role in education and science and technology development, but also increasingly to turn those scientific developments into useful innovations whenever possible and desirable. Throughout the world, governments – national, regional and local – are seeking ways to strengthen the "third stream" role of universities as agents of innovation based growth, looking for a more direct and larger scale involvement of universities in knowledge transfer than ever before (Veugelers and Rey, 2014). This third stream role of universities cannot be harnessed except through a working relationship with the industry coordinated by the government.

### **Industry**

Small and Medium Scale Enterprise (SME) has proved to be a major tool adopted by the developed nations to attain socio- economic development. In recent time, small scale industrial sector is considered to be the backbone of modern day economy (Opafunso and Adepoju, 2014). In both the developed and developing countries, the government is turning to small and medium scale industries, as a means of economic development and a veritable means of solving problems. It is also a seedbed of innovations, inventions and employment. Presently in Nigeria, SMEs assist in promoting the growth of the country's economy, hence all the levels of government at different times have policies which promote the growth and sustenance of SMEs (Ayozie *et al*, 2013).

This opinion is also shared by Safiriyu and Njogo, (2012).which opines that in most developing and transition economies; there is now a consensus among state policy makers, development economists as well as international development partners that small and medium enterprises [SMEs] are a potent driving force for their industrial growth and indeed, overall economic development (Safiriyu and Njogo, 2012). Present contributions of SMEs to Nigeria's economy are from solo efforts with few scattered support from one government agency or another. For Nigeria to evolve into an industrialized economy the Industry must be revolutionized into a knowledge based sector by enabling it with the third mission role of universities as agents of innovation based growth.

### **Government**

The legislative arm of government at the three tiers are importantly the body responsible for appropriating for infrastructural provision and support for both industrial and educational practice in Nigeria. University coordination, monitoring and regulation are the responsibilities of the National Universities Commission (NUC). Supportive agencies for coordinating, monitoring and aiding SMEs in the country are the National board for Technology Incubation (NBTI) and Small and Medium Enterprises Development of Nigeria (SMEDAN). Other regulatory Agencies–mandated for regulating business and industrial practice through

inspections and testing include Standard Organization of Nigeria (SON), National Agency for Food & Drugs Administration and Control (NAFDAC), Federal Environmental Protection Agency (FEPA), National Drug Law Enforcement Agency (NDLEA) amongst others (Igun,2016).

The process of economic development has shifted over the last two decades from a top-down government model to a more collaborative model involving state, local, and federal governments, companies, business associations, colleges and universities, and other institutions. This implies that building the competitiveness of a region has become a bottom-up process in which many individuals, companies, and institutions must take responsibility. Indeed, every region and cluster can take steps to enhance its competitiveness (Porter, 2007).

Research and experimental development (R&D) play an important role in innovation, which, in recent years, has taken center stage as one of the main drivers of economic growth and poverty alleviation, policy-makers in turn, can help spread the benefits of innovation through policies that encourage growth in the areas of science, technology and innovation. Nigerian political leaders, policy makers/implementers, sectors/institutional administrators unfortunately are yet to fully key into this global trend that revolutionizes crude production, poor yield, insufficiency, poverty, un-fulfillment, stagnation, underdevelopment and the likes into high proficiency/productivity, poverty eradication, fulfillment and development as observed in some other parts of the world through research and development (Odia, 2013). The Government as manager of the economy holds the responsibility to harness the Academia to foster the Industry leading to enhanced GDP and the overall wellness of the citizenry.

## **II. Aim and Objectives**

The aim of Government–Industry-Academia collaboration is to accelerate the Economic and Industrial development of the country.

The objectives are:

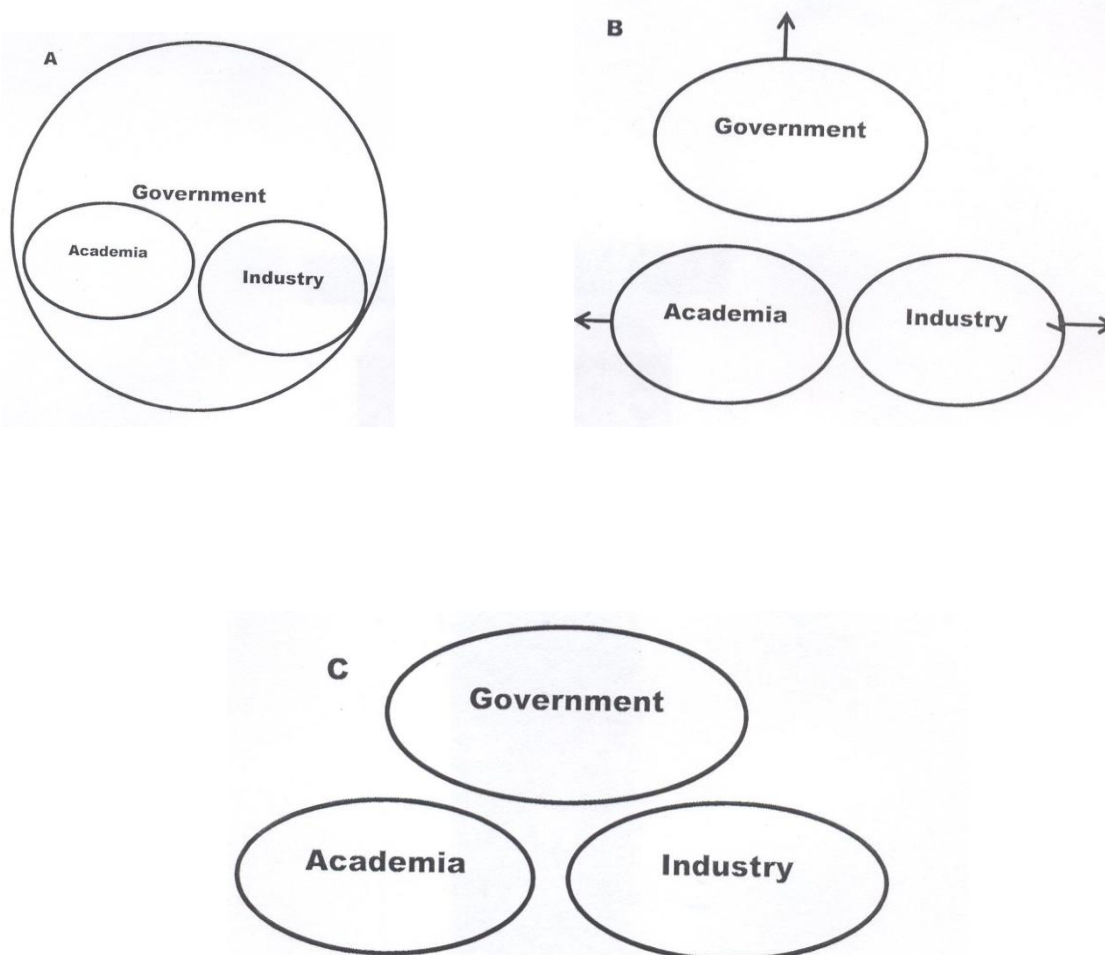
- i. To harness the talents in the academia towards intellectual contribution to industrial products and processes.
- ii. To translate viable R & D result into competitive market products.
- iii. To encourage a culture of techno-preneurship with the academic.
- iv. To create investment and generate funds for the university and researchers as well as generate sustainable jobs through all forms of technology transfer, intellectual property acquisition and commercialization

## **III. Methodology**

Data for this paper were derived from secondary sources: previous researches and analyses of scholars, government documents; as well as journal articles that are related to the subject as the study involved an extensive literature review which critically analyzed the present status and deliverables which the University can offer to foster industry activities in all sectors of our economy as well as the supportive and regulatory roles which the government must play to ensure the quick reversal of the ongoing recession and continuous growth of our GDP. It structures the triple helix model relationship to achieve Government-Academia-Industry collaboration which would achieve the stated objectives.

## **IV. Collaborations**

Presently, industries in Nigeria are companies and individual entrepreneurs in solo effort at identifying needs and crafting ways and means leading to the production of goods and services in the country. The universities and other institutions of higher learning erect curriculum as approved by relevant agencies and conscientiously execute the curriculum to ensure that students are dully equipped with knowledge to excel in their various carriers. The Government has established academic and industry aiding and regulating Ministries and agencies like the Ministry of Education, the Ministry of Industry, Trade and Investment, the National Universities Commission (NUC), the National Board for Technical Education (NBTE), the National Board for Technology Incubation (NBTI), Small and Medium Scale Enterprises Development Agency of Nigeria (SMEDAN), Council of Registered Engineers of Nigeria (COREN) amongst others to oversee, regulate, aid and supervise as the case may be the various activities within their mandate. Their individual inputs and actions on the academia and industry are scattered and uncoordinated evidently impacting very poorly on the economy. It has become difficult to itemize the positive impacts of our universities on the economy apart from the students graduated in various disciplines. It is also difficult to explain the positive impact of Science and Engineering on the economy of Nigeria given the numerous research institutes and agencies in the sector, funded by the government. Figure 1 A, B and C depict current forms of relationship between the Government, industry and Academia in Nigeria.



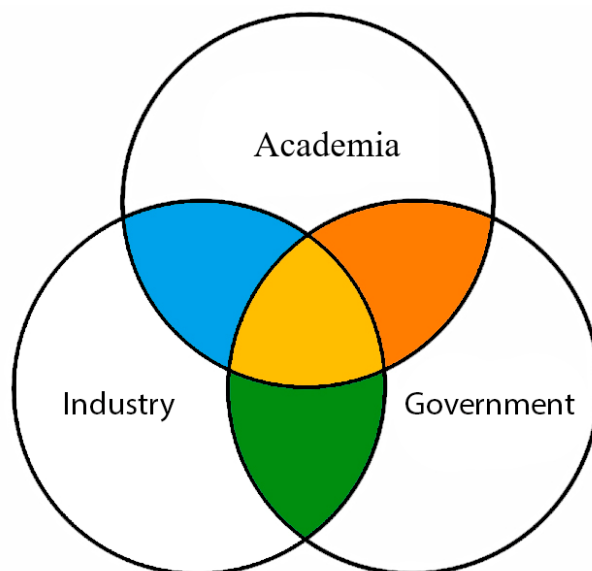
**Figure 1C: The three intuitions are operating based on a weak relationship. The interaction between them at any given point in time is not based on common grounds**

### **V. The Triple Helix Solution**

The concept of the Triple Helix of Government-Industry-Academia relationships encompassing elements of earlier precursor works was officially developed in the 1990s and interprets the shift from a dominating industry-government dyad in the Industrial Society to a growing triadic relationship between university-industry-government in the knowledge based economy. Through subsequent improvements the concept has grown into a conceptual framework for exploring the complex dynamics of the Knowledge Society and for informing policy-makers at national, regional and international level in the design of new innovation and development strategies (Rangaa and Etzkowitz, 2012). The "triple helix" depicted in Figure 2, is a coiled model of innovation that captures multiple reciprocal relationships at different points in the process of knowledge capitalization.

The first dimension of the triple helix model is internal transformation in each of the helices, such as the development of lateral ties among companies through strategic alliances or an assumption of an economic development mission by universities. The second is the influence of one helix upon another, for example, the role of the federal government in banning rice importation through land borders and consequent encouragement to rice processors and rice processing equipment fabricators to create improved productivity in the sector. The third dimension is the creation of a new overlay of trilateral networks and organizations from the interaction among the three helices, formed for the purpose of coming up with new ideas and formats for quality technology development leading to product competitiveness. The triple helix denotes the university-industry-government relationship as one of relatively equal, yet interdependent, institutional spheres which overlap and take the role of the other (Etzkowitz, 2002). It is the position of this paper that the triple helix model can be applied holistically to engender sound economic growth through knowledge based industrialization. Firstly the different sectors in the industry should interact regularly by way of societies or cooperatives where knowledge-solvable industrial problems are identified. These problems are passed to the requisite government agency or ministry

handling industrial development. These steps take us through the first and second dimensions of the model. In the same vein similar faculties of various universities should regularly interact so that each will know the R&D levels of each other in the various sectors. The government pilots the triple helix by ensuring that University students and lecturers solve identifiable and itemized industrial problems by employing university teaching and research skills and infrastructure even as they engage in the mandate of the institution. The final dimension of the triple helix is thus achieved with resounding effects on industry activities and production invariably leading to strong economic growth with continuously enhanced GDP.



**Figure 1: Triple Helix Model**

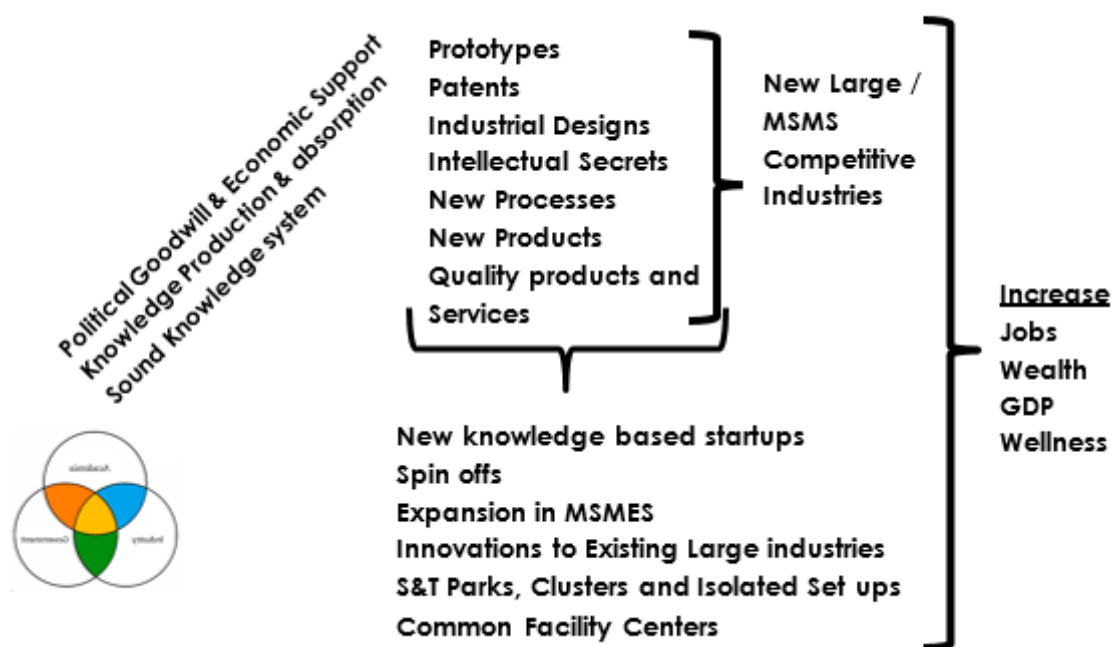
#### **Collaborative Strategies**

There are several possible forms of GIA Collaboration that are in line with the triple helix model which would promote innovation creation and improvement in the country's GDP. Some strategies include:

- i. University and tertiary institutions students' final year projects shall be geared towards solving problems in industry.
- ii. Research partnership such as inter-organizational arrangement for pursuing collaborative R&D including research consortia and joint projects, and ceding successful results to entrepreneurs.
- iii. Research services such as research related activities commissioned to Universities by industrial clients including contract research, consulting, quality control, material testing, certification, prototype development, etc.
- iv. Shared infrastructure such as the use of University labs and equipment by firms, incubators and S&T parks located within the proximity of the University.
- v. Academic entrepreneurship in form of development and commercial exploitation of technologies pursued by academic investors through a company they (partly) own-or work with. (Spin offs).
- vi. Human Resource Training and Technology Transfer in form of training of industry employee, internship programme, industry based PhD programmes, secondment of University faculty and research staff to industry.
- vii. Commercialization of intellectual property such as university generated IP (E.g.: patents for firms via licensing):

#### **Interactions and Output of GIA Collaboration**

The contingent results and benefits attainable by strategic collaborations and interactions between the Government, Academia and Industry are depicted in Figure 2.



**Figure 2: Interactions and Output of GIA Collaborations**

## VI. The way forward

As we strongly advocate for a shift from resource to knowledge based economy, the following solutions are hereby presented as immediate knowledge based activities needed to get the country on the march to strong continuous economic growth and industrialization. They are:

- i. Select policy instruments that will strive the national needs in consultation with all stakeholders.
- ii. Based on the limited budget, stakeholders must make complex choices between collaboration in education or in research, between established firms (marching grants, consortia, etc) or between new firms (startups or spin offs) and developmental of S&T parks and clusters.
- iii. Government must work with the industry and academia to understand the scientific and technical gates to the next generation solution and find research that directly translates into solving the nation's most essential needs.
- iv. Establishment of Science & Technology Parks, innovative clusters, common facility centers and other knowledge driving facilities with strong academia linkage will rapidly promote Nigeria's industrial base.

## VII. Conclusion

A lot of easily implementable theories that could aid in industrializing the country have been suggested in the past and as days pass more theories are bound to be propounded. The critical issue in economic growth and industrialization is increased viable productivity in all the sectors. Improved viable productivity is fostered through innovative creations which are the reserve of academic institutions. Collaborations between industry and academia presently are loosely tied. It is opined that the government should as a matter of urgency institute the necessary guidelines and enact enabling policies that will usher in an era where industry growth and problem solving is initiated and executed by the universities as they take the leadership role in a knowledge based economy. We must support education at all levels as well as encourage linkage between Policy, Knowledge and Productivity so that the country's name can be expunged from the list of consumer nations. We must harness all the R&D outputs that can be converted into new products and services so as to reduce dependence on foreign goods and also create knowledge driven jobs for our citizens.

## References

- [1]. Ayozie D. O., Oboreh J. S. and Umukoro. Ayozie V. U. (2013). Small and Medium Scale Enterprises (SMES) in Nigeria the Marketing Interface. Global Journal of Management and Business Research Marketing Volume 13 Issue 9 Version 1.0; p. 1.
- [2]. Etzkowitz H. (2002). The Triple Helix of University - Industry – Government Implications for Policy and Evaluation. A publication of Science Policy Institute, ISSN 1650- 3821; p. 2.
- [3]. Igun B. O. A. (2016) Promoters of Entrepreneurship: Role of Government and Agencies. Proceedings of ICAN Entrepreneurship Launching Programme, Lagos; p. 10.

- [4]. Odiya L. O. (2013). Research and Development Initiatives in Nigeria: Challenges and Prospects. *Mediterranean Journal of Social Sciences*; Vol. 4 No 2; ISSN 2039-2117 (online); ISSN 2039-9340 (print); p. 258.
- [5]. Opafunso Z. O. and Adepoju O. O. (2014). The Impact of Small and Medium Scale Enterprises on Economic Development of Ekiti State, Nigeria. *Journal of Economics and Sustainable Development* ISSN 2222-1700 (Paper) ISSN 2222-2855 (Online) Vol.5, No.16; p.
- [6]. Porter M. (2007). Colleges and Universities and Regional Economic Development: A Strategic Perspective Harvard Business School. Excerpted from *Forum Futures* 2007; pp. 41-43.
- [7]. Rangaa M. and Etzkowitz H. (2012). Triple Helix Systems: An Analytical Framework for Innovation Policy and Practice in the Knowledge Society. Publication of Human Sciences and Technology Advanced Research Institute (H-STAR), Stanford University, Stanford CA; p. 3.
- [8]. Safiriyu, A M and Njogo, B. O. (2012). Impact of Small and Medium Scale Enterprises in the Generation of Employment in Lagos State. *Kuwait Chapter of Arabian Journal of Business and Management Review* Vol. 1, No.11; p. 108.
- [9]. Veugelers R. and Rey E. D. (2014). The contribution of universities to innovation, (regional) growth and employment. European Expert Network on Economics of Education (EENEE) Analytical Report No. 18; p. 10.
- [10]. Whitehead A. N. (1927). Universities and Their Function. Proceeding of the American Association of the Collegiate Schools of Business Conference; p. 2.

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