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FOOTBALL THEORY OF SCIENTIFIC DEVELOPMENT: A THEORY FOR THE END OF AFRICA'S UNDERDEVELOPMENT

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Abstract
This paper approaches the developmental quest by the African States through a theoretical prescription. The paper expounds on the football theory of scientific development (FTSD), arguing that the theory has a recipe for ending African underdevelopment. The neoclassical economic prescription which stresses the transformative power of capitalism that spurs individual productive units from meager self-sufficiency to an integrated network of markets, information technology, and international institutions has failed to produce the expected results in Africa. While the failure is blamed on the African political elites to manage their economy and politics, however, a central argument blames colonialism that produced the circuit of capital and production that target draining raw materials and the peripheralization of the African political economy to service the industrial needs of metropolitan states. As the extant policy frameworks are premised on existing economic theories, in contrast, I extrapolate analogically from football to offer a theory of development that is deemed best suited to address Africa's underdevelopment. While extrapolating from football, this theory demonstrates how indigenous ideas and practices can unleash the technological potentials African countries require to compete in a global economy. Although the theory is grounded in observation, it is a causal inferential theory that is premised on the explicit acknowledgment of the disparity in economic development between African and Western economies.
Keywords: Africa's underdevelopment, Development paradigm, Football theory, Global economy, and Scientific development

Introduction

The illusion that independence from the colonialists will translate to victory over economic dependence has vanished from the African political lexicon. This is not a misplaced assertion. Africa has experimented with several economic theories meant to emancipate the continent from economic dependency; yet poverty, infrastructural decay, diseases, vicious crimes, conflicts, and wars are manifest. It is equally important to argue that Africa has also failed to use foreign aid from donor countries and agencies to address the various challenges confronting the continents. Certain questions emerge; why has Africa remained under the circle of dependency? What theories guided its developmental paradigm? Could

there be an unexplored paradigm for economic development in Africa? This paper unpacks these questions. I first look at the Import Substitution Industrialization (ISI), Africa Socialism, Structural Adjustment Programme (SAP), and Infant Industrial Model (IIM) as theories that provide economic development paradigm for Africa and some other countries after which football theory of scientific development is presented in the section that follows. Subsequent sections situate football theory of scientific development against the background of other social science theories and made an argument to show that the theory is derived from observation and finally a conclusion.

Theories Serving African Economic Development Paradigm

Import Substitution Industrialization (ISI) emerged as a "theoretical vehicle" by the 1940s in developing nations after Africa gained independence from colonial rule (Rapley 1996). To understand ISI is simple. ISI is a theory that guided African nations on how to put a stop to the importation of goods consumed locally. The step required that foreign investors should bring in their technology to set a branch plant in the host country to produce goods for local consumption. A monopoly of production has to be guaranteed to the foreign investors to encourage them. Tax holidays of up to ten years, duties on imported inputs were often rebated to manufacturers and subsidized credits were provided through government banks to facilitate the new industry. Import licensing and tariffs, which in some cases exceeded 100 percent sheltered the local markets from foreign competition (Rapley 1996: 28-29). Recommended by the structuralist, for example, Gilpin (1987), ISI encouraged governments to invest in heavy industries as car assembling plants and refineries, leaving consumer goods to local entrepreneurs whose operations were favored by protective tariffs and in some cases complete prohibitions on imports (Rapley 1996: 30).

There are several critiques against ISI. The technologies needed for ISI were still imported from the colonial masters that African leaders displaced. Goods produced under ISI cannot be exported outside the continent or to the country where the technology originated. Except where locals are trained, foreign experts operate the technologies, and replacements of any parts are done by the parent company at their bidding. Some of the heavy industries like the Ajaokuta Steel Company Limited, built by a Russian firm in the 1970s in Nigeria (Odunlami 2008: 37-43) was designed to satisfy local needs at a very high cost. The aluminum plant built by Kaiser-Reynolds alongside Volta Dam in Ghana in 1965 did not only use imported technology but even imported bauxite rather than local supplies (Rapley 1996: 41). Pack (1993) showed that the inefficient use of technology was widespread in Africa. The simple argument is that heavy payment of foreign experts, servicing of machines, and replacement of parts[1], excessive subsidies, etc could not have

[1] Writing about non-functional refineries in Nigeria Majirioghene (2008: 22) posits that the Port Harcourt Refining Company (PHRC) is a $2 billion government subsidiary constructed 43 years ago with 60, 000 BDP refining capacity. The old section, which was shut down because of a fire incident that destroyed its crude processing unit in 1991 needed nearly ₦200 million for it to come back to life. It did not, however, mostly because there were published reports in *The Guardian* newspaper that Soimi Nigeria Limited, the Italian firm that handled the repair used mostly old parts to carry out repairs of the aging PHRC.

arisen if the technologies for production were fabrication locally, therefore, ISI was counterproductive.

It is important to note that ISI operated alongside African socialism, which served as ideology-cum-theory championed by some African leaders like Kwame Nkrumah of Ghana, Sedar Senghor, Tom Mboya, Modibbo Keita, Sekou Toure, and Julius Nyerere (Mutiso and Rohio 2007). These men constitute the first political leaders of their countries after independence. Common to them irrespective of different approaches the philosophy of African socialism was that Africa needed to invent its development strategy; one that eschews capitalism and communism. The African past that rested on collectivist and peasantry modes of economic production was thought to represent a model that can be replicated in this modern era. African socialism, therefore, was pushed as an identity assertion that emphasized traditional moral values as a means of mobilization.

However, there was no absolute consensus as the activities of leaders like Mobutu Sese Seko raised questions about moral values that served as a mechanism for mobilization. Also, there were other radical leaders like Nyerere, who extolled the villagization of peasant agriculture but Nkrumah scorned at agriculture, seeing it as little more than bondage. The leaders then could not resolve their interest in protecting common people and their role in marketing boards (Young 1982). In this case, African socialism was seen as the importation of Marxist and Leninist ideas into Africa or mystical glorification of the African past often used as intimidation of opponents.

ISI and African socialism, therefore, failed to move Africa away from economic dependence on the developed countries. Though ISI had replaced imports with locally produced goods the technology and the inputs used were still imported. Just as the moribund oil refineries in Nigeria, the cost of the imported inputs often outweighs the savings generated from the production of local consumer goods. African leaders could not finance, stimulate, or encourage scientific innovation, therefore, relied on foreigners who came in with their technologies under ISI. Unfortunately, the profits made by these foreign companies "were shipped" back to their home countries instead of reinvestment in the host countries, thereby stripping off economies of scale. Moreover, producing for local consumption eroded the improvement in the quality of goods since it was not meant for export to developed countries. Though the system created what Rapley (1996: 42) called "economic islands" but it could only empower a few favored class who owned the resources either through equity participation[2] and small industrial workers, largely ignoring millions of rural agricultural communities[3] who have to migrate to urban areas in search of paid employment. The practice raised urban squalors descriptive of what Karl Marx referred to as "reserve army of the unemployed" (Green 1991) resulting in the paradox of fabulous wealthy living side-by-side with subhuman squalors.

[2] It is of note that most Africans became incorporated in a tangential form either because they donated their lands in which the industries were sited (often the monetary value of the lands were taken as equity share in the company) or because they counter-signed investment agreement for foreign investors.

[3] The Directors of the Marketing Boards, who purchased their products at "killing prices", left them in penury (Beer, 1976).

The neglect of agriculture which serves as a key to development (Castles 2007, Banaji 2010, Empson 2016), was rather penalized because of ISI (Rapley 1996: 43). Rather than emphasize institutions that build up human capacity that spur research on technology (Wood 2017), the African government developed a penchant for the consumption of imported luxury goods from developed countries. Production cash crops like cocoa, groundnuts, and palm oil provided opportunities for the emerging urban middle class who were on exports of the products than on foods consumed locally. Therefore, obtaining a foreign loan for the business got them more enmeshed in the manipulation of the colonial masters (Abiwon 2017). In the area of corruption, some African political leaders kept alive the Swiss banking industry through their private looted money that continued until today (Joseph 1987, Nyong'o 2009, Reno 2009, Enweremadu 2012, Pierce 2016). Describing corruption in Kenya Nyong'o (2009: 164) argued, "Kenyans seem to adopt the time-honored philosophy of hearing nothing, seeing nothing, and saying nothing about corruption in public life". The failure resulted in the emergence of the Structural Adjustment Programme (SAP) recommended by the neo-classical theorists as a model for African development, which did not move Africa away from the circle of poverty and dependency.

Though Africa has marginally interacted with the global economic community, the introduction SAP in the 1980s signifies the first step to entangle Africa into the global economic matrix because it tends to give Africa a level playing ground only if her products meet the standard of global consumption. SAP encourages private sector investment, decentralization of public service provisioning, private sector provision of basic infrastructure, liberalization of trade, privatization of state-owned agricultural enterprise, devaluation local currency, and reform of public financial management and accountability procedures (Rapley 1996: 71). The adoption of SAP was a guarantee to loan from the World Bank and International Monetary Fund (IMF) and foreign direct investment (FDI) (Bird 1995). However, as Okonjo-Iweala (2012: 99) and Rapley (1996: 69), show, some African countries did not fully adopt the neoclassical prescription and in the case of Nigeria, the policy was adopted without taking the loan under Ibrahim Babangida regime.

SAP as a rational economic theorem ignored the ecological context on which the African socio-political environment is based. Particularly, Bauer (1984) argues, that Third World peoples did not follow the rules of market rationality. Being backward, uneducated, and bound by the cultural traditions that frowned on selfishness and individualism, states in Africa were seen as the only investor because there were too few private entrepreneurs for the job. Developmental states in East and South Asia as South Korea, Taiwan, Thailand, and China, etc are more representative of the description by Bauer than Africa where the leaders used the states as an instrument for self-enrichment. The states in Asia adopted authoritarian rule or repressive government to appropriate resources from the people especially farmers but in turn channeled the resources for the overall development of their states through innovative education, scientific and technological development, and industrialization (Aldcroft 1996, Moore 1996, Rapley, 1996). This is contrary to African leaders that took an authoritarian and repressive approach to exploit the resources that belong to the people for their self-enrichment. Joseph (2006: 7) captures Nicholas Eberstadt

who argued that Africa "arguably constitute the twentieth century's greatest developmental failure". In the same article, he captured an argument made by Chief Obafemi Awolowo in a Faculty Lecture in 1973 at the University of Ibadan where Awolowo wrote:

> The United Nations Organization, among other things to conjure a euphonious state of mind in the people of economically backward countries…and in order not to offend the sensitivities … and to enhance the dignity of their leaders and the morale of their people, a euphemism like "developing" was invented to characterize economically backward countries. Joseph added that the use of "developing" to describe these backward people "can induce and does appear to be inducing in them a delusion of progress amid relative economic retrogression" (Joseph 2006: 2-3).

In the same vein Joseph (2006: 2-3) captured Dele Olojede, Nigeria's Pulitzer prize-winning journalist remarked in a public lecture in Lagos in 2006 that as saying "we are traveling down on an escalator that is going up.

Africa has continuously strived to grapple with backwardness but as Stewart (1985) argues, Third World countries must deal with the problems peculiar to technological latecomers. This point is also stressed by (Aldcroft 1996: 1), where he posits:

> It was once thought that there were advantages in being a latecomer to economic development since late developers could learn from the mistakes of the early starters, adopt the latest technology and skills. And hey, presto, before very long they would overtake the latter who tended to develop inertia and slow down.

He further argues (p 3), Africa, therefore, sought to impose capital-intensive programs on the labor-surplus population. Neglecting agriculture, and planting metropolitan educational systems and other infrastructures, which were often inappropriate to indigenous conditions and forgetting the historical experience of the early developers, namely that Rome was not built in a day. Aldcroft in page 5 cited Chirot (1985: 192-3) who argues: later industrialization could not have occurred had markets of all sorts not achieved such a high state of development in preindustrial Europe: capital markets; labor markets; commodity markets; and even by analogy a kind of intellectual market for new ideas, important thinkers and artists, and technological innovations.

The system of education in Africa did not target harnessing the local intellectual market place of ideas after independence from the colonial rule. Rather there was strong variance against indigenous knowledge and traditions of the people by African nationalists. This is contrary to the example from Korea where the importance of indigenous technology development efforts for successful industrialization was emphasized. Suh and Chen (2007) showed that Korea's educational system was designed to elicit skills from the people right from the lower levels of schooling and any foreign technology must be adapted to local conditions to enhance domestic productions. As Aldcroft (1996: 19) argues:

> many less developed countries (LDCs) feel that time is not on their side. They want jam today, not tomorrow; and they blame rightly or wrongly, the West for their predicament, a convenient scapegoat when things go wrong. And they frequently do, because to overcome the backlog of backwardness, they adopt policies designed to achieve the impossible, that is to bridge the gap in development within the space of decades even though their economic and political systems are not in a position to deliver the goods.

In response to the yeaning technological gap, universities of science and technology were established in some countries expecting technological transfer from the developed countries (Okongwu 2007) which I consider as a great delusion. It is a great illusion to think that closing uneven development (Löwy 1981, Callinicos & Rosenberg 2010) existing among nations could come from mere wishes. For example, rather than transfer technology to Nigeria to install her broadband multi-media services, telecommunications, and broadcastings she entered into a contract with China to build a Nigerian telecommunications satellite in 2007 at a sum of 340 million dollars (₦50.3 billion) for 15 years. Unfortunately, the satellite referred to as NIGCOMSAT-1 failed in 18 months after it was launched in China in 2008. As a form of aid, China promised to build another one for Nigeria (*The Business Eye* 2009: 24). An important question emerges if China will continue to repair or replace in case of damage or loss of the satellite indefinitely in the absence of indigenous scientists.

Expected to the cut-shut omnipotent hand of the state, or what Castles (2007) refers to as disappearing state in the age of globalization, SAP, as practiced in Africa, did not spur individual initiatives in economic planning. Institutions designed mostly for political patronage as in the early independence were not discontinued. The failure once again was blamed on the entrapment with corruptions and over-bloated bureaucratic institutions. The form of bureaucracy that emerged in Africa forms to what Linz and Stepan (1996: 51) citing Max Weber referred to as "sultanism". A system produced through patrimonial rule where traditional domination developed administrations, which were purely personal instruments and operate primarily based on discretions. To contain the intransigence arising from the wrong notion that development is rooted in democracy (Moore 1996: 52-55), African leaders oscillate between authoritarian and electoral democracy (Schedler 1998: 94) in an attempt to manage conflicts, banditry, terrorism, insurgency, and agitation from the white-collar middle class that often makes a demand on the political system.

The problem of Africa lies more in her inability to develop indigenous scientific-technological innovation that could leverage in her competition with others in the global system. Unevenness in the economic condition is universal. In a time in history when other parts of Europe could not catch-up with British domination in industrial development Friedrich List propounded what he referred to as the Infant Industrial Model (IIM) for other European states. His argument was made against Adam Smith's classical economic theory who generalized his conception of the entrepreneur operating with maximum freedom under a minimalist state to the outer world (List 1966). He argued that other European states needed to nurture and protect their economies until they catch-up with Britain. Only then could they open up for an unregulated world economy. As posited by

Rapley (1996: 126), Friedrich List is not an economist by training and some of his ideas seem simple to contemporary economists but the tradition he started proved to be popular ever since and has been added to many times to the developmental state model theory.

Notwithstanding, I argue that IIM may be difficult to implement in Africa unless Africa develops indigenous science to handle the technology needed for her industrialization. It is extremely difficult to protect production under a licensed technology from a country that wants her products sold in your local market. Like the case of ISI, the gain from IIM may be lost in payment of technology and experts from developed countries when Africa lacks indigenous science to handle the technology. Therefore, IIM was possible in other European states because of their ability to forge technology outside the control of Britain. This situation is not available to Africa yet, hence the export of primary products has remained her anchor as a comparative advantage. The establishment of the African Growth and Opportunity Act (AGOA) by U.S Congress in 2000 (Williams 2019), which granted opportunities for some categories of products to be exported to the US market, is an indication that products from Africa cannot compete favorably with other products from elsewhere. Unfortunately, primary products like crude oil, minerals and metals, agricultural products, chemicals, and certain categories of textiles and apparels are permitted. As Williams 2019 shows, U.S motor vehicle imports from South Africa have fallen from $1.6 billion from their 2013 peak to $572 million in 2018. Though imported from South Africa there is no doubt that the vehicle company is a branch plant of one of the companies from the developed countries.

In the same vein, Rottger (2004: 17) shows, Blue Skies a company in Ghana producing fresh fruit for export to Europe will have to cut and slice the fruits and export them within 24 hours of delivery to the processing factory to Europe under good agricultural practice certified by the European retailers (Eurep GAP). All these follow the law of comparative advantage championed by the World Trade Organization's (WTO) international economic order (Orjiako 2000, Stiglitz 2004). These products exported as raw materials could have multiple by-products when processed. Of course, what the importers pay is the single commodity and not the by-product. However, when processed locally in the country of origin these other by-products will generate more monetary value and through economies of scale spur a chain of industrial clusters. This pitiable state of affairs could not have been if Africa has its indigenous scientific-technological innovations. The football theory of scientific development, therefore, emerges to provide a paradigm for Africa to contain the problem of technological backwardness.

Football Theory of Scientific Development as a Recipe

The football theory of scientific development as I want to show in this piece may not apply to other climes but certainly can be applied to Africa that is still toddling with scientific-technological development. Cox (1986: 207), cited by Hazbun (2017: 656) argues that "theory is always for someone and some purpose. There is … no such thing as a theory in itself divorced from a standpoint in time and space". My theory emerged having observed football games over the years. Providing an arena for social formations, football as a game provides an opportunity for unequal countries and continents to interact in one football

pitch. Unlike other sports that largely display some cultural bounds[4], nations use football to interact with one another, neglecting the fact that among the many teams playing the only 1st to 3rd position winners will emerge. The football game is a wonderful device by a human being that can be extrapolated to deal with the manifest gap in scientific-technological development.

Football game highlights fundamental lessons that triggered my interest. This is a game where the coach that trains other players may not necessarily have been a first-class player. The coach him/herself knowing the full techniques of football is humbled to provide training to players to upgrade their skills. Football is a game that is constantly searching for young talented individuals undermining their socio-cultural and economic backgrounds. A particular player is hired for very monetary costs simply because he or she has the mastery of playing efficiently in a specific wing either as number nine or any other number in the football pitch. The skill is more important than their certificate, color, beauty, handsomeness, or race. Some of the world-class players were identified and picked at a very tender age by individuals who understood their potentials. Football is a game that is driven by the intention for success but the sponsors are not deterred by the embedded failure associated with the game. At the national level in some African states, individuals, corporate bodies, and governments own football teams and some own sports academy where the young talents identified are trained. At the continental level, each state in Africa has a national team as a mark of sovereign identity competing with each other for a football trophy known as the Confederation of African Football (CAF). As designed by the Federation of International Football Association (FIFA), each continent is expected to have one or a few football teams that competes with other continents at the global level. A team playing at this level appears to draw collective sentiment or support of their entire continent especially during the quarterfinal, semifinal, and final matches. A football game is wonderful and in real sense globalization in practice[5]. The theory, therefore, drew from the principle of football game seeing it as a game that provides a common feeling among diverse ethnic groups within Africa while playing with teams from other continents and within a country, best players are sorted and harnessed by team coaches irrespective of ethnic background.

Extrapolating from the fundamental principles of football as it manifests in form of regularities, I, therefore, use it as a theory and first set out tertiary institutions (Universities, Colleges of education, Polytechnic) as the national and state teams. I set the professors and other lecturers in these institutions as the coaches. I set the individual students, lecturers, and non-students including illiterate individuals in rural and urban areas as the players.

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[4], The Taekwondo game is mostly associated with South Korea; Cricket and Hockey, India; Rugby and Basketball, America; and Ayo Olopon, Africa. Some other sports require certain facilities that may be lacking in Africa. Therefore, in all sports football, which originated from Greece but popularized by England commands a global appeal, and in Africa, some public centers are created in cities and rural areas where people gather to watch European and African leagues.

[5]. Although, it should be stated that though some form of conflicts may occur during a football match, fundamentally football is a game that provides combined interactions that draw from the skills of players irrespective of their cultural or economic background.

The role of the coaches (professors and other lecturers) as team leaders in the institutions is to identify the skills in the students, fellow lecturers, and non-students including illiterate individuals in rural and urban areas, and train them to develop their skills or potentials in science, technology, and innovations. I separate Professors from other categories of lecturers because in their hierarchy they can identify the skill in young lecturers and like a coach in a normal football team will not feel humiliated to train and promote a young lecturer under him for the sake of national and collective development. The Professor as a football coach would sincerely build up the talent in the young lecturers to a product for market value.

Now, what skills should the coaches' lookout for in the players? So many skills can be scientifically harnessed for economic development. Science, as used in this theory simple, denotes a systematic process that is applied in identification, selection, and the development of any knowledge or skills. I propose harnessing talents or skills from both students in the tertiary institutions and non-students including illiterates because talents are more often genetically gifted than learned. Also, some people that could have high imagination in rudimentary science may not have the resource to get admission into tertiary institutions in Africa. Understandably, the skills I will highlight in this theory may have been included in the learning curriculum but the non-talented individuals who got admission to read such courses often struggle to regurgitate what they were taught or unable to revolutionized the ideas learned. I also advocate that the coaches' in the tertiary institutions do not force English or mathematics courses to players harnessed from outside tertiary institutions but to simply observe and ask them questions in the languages they understand to explain their skills displayed in the innovations that drew the attention of coaches.

As an obligation, therefore, the coaches in the tertiary institutions assume the role of searching for an individual with skills. Skills in art known as an artist can be highly instrumental to cloth and footwear industries. Extending from artists are those that have skills in architecture. Artists and Architectural experts are highly useful in industries involved in packaging, automobile, and other complex engineering design. There are also those moving about carrying natural leaves, juice, and liquid substance made from herbs advertising to people their efficacy in curing one ailment or the other. They have often asserted originality of the knowledge when accosted on the source of their knowledge or claiming that they inherited it from their parents or ancestors. These set of people are called traditional medical practitioners, which apply for herbal medicine in curing their patients. They are highly useful for pharmacological science that is seriously yearning for attention in Africa. Again, there are some individuals known as goldsmiths and some that have natural talents in sculpture scattered all over Africa. Their role is majorly to fabricate using locally melted iron or any other object. These are the talents India harnessed to re-fabricate machines and tools imported using its natural iron deposit found in the country during her early experiment with ISI (Rapley 1996: 33).

Some young and elderly Africans have displayed skills in building cars, electrical driven devices, and other surprising innovations on the street to the admiration of onlookers. Academic institutions as a team should harness these individuals so that their

ideas can be transformed into products for market value. Certainly, some students and lecturers may have displayed these skills identified within the campuses but the skills are merely celebrated as a feat without further effort to develop it into products for market value. My theory is to raise the consciousness of the academic community to the realization of their role as a center for harnessing talents. They should be in constant search for a good player. Tertiary institutions could set up a special fund, even 0.1% of its revenue either internally generated or from federal or state allocation to identify and develop skills. There are specialized schools for technical and vocational studies that in a practical sense are training people to acquire skills on how to manage existing technology and largely to be self-employed. My theory advances high knowledge than that. It seeks to elicit original ideas in people that will create new technology or indigenize existing knowledge.

The skills (or talents) that may be displayed by the lecturers, students, or those harnessed from outside the academic environment may be too expensive for a single institution in Africa to finance. Besides, the ideas may not result to complete science that can produce one complete product like a motorcar, motorbike, etc, but only a part of it, just like a component of a chemical, which requires other chemicals for a production of a particular drug. The university and other tertiary institutions acting as a team is not limited to its immediate campus but can propose a collaboration with other institutions in Africa and elsewhere for financing and developing the idea into a product for market value. The institutions also can buy the component idea from other institutions or incorporate the conveyor of the idea in the ownership of the technology. This is observed when super football teams in Europe, America, and Asia purchase African best footballers to enhance the competence of their team in a global football competition.

Each state in Africa requires anthropological and sociological studies to identify its cultural areas and individuals that provided science and technology on which pre-colonial Africa was embedded. The talents identified and developed will prepare each country as a national team to play with other Africa states at the continental level just like the Confederation of African Football (CAF) but the ultimate goal is to produce such high-level science and technology that can compete at the global level just like a FIFA organized tournament. Each country may not achieve a complete production of any particular product as the case may be, producing a part provides the opportunity for crisscrossing investment. Even tertiary institutions in Africa can enter crisscross research endeavor, which at the end can be used for crisscross investment with other technology producers in Europe or America after which the profits after the sale are shared on the monetary value of each part. Even arts or drawing are parts are paid for in industries. Most importantly is that universities and other tertiary institutions may have corporate integrity to enter into a partnership with individuals and other corporate bodies for funding, development, and marketing of an idea and products for economic gains.

Football Theory of Scientific Development and other Social Sciences Theories

Socioeconomic theories as pointed out by David Easton in his book, *The Political System* attests that a basic criterion of a theory is that it must meet the requirement of either a value theory or causal theory (Easton 1953: 52-56). Value theory is what Easton refers to as political values or the philosophy of politics. This is an aspect of theory usually criticized

by physical scientists as laden with value judgment in which Easton (1953: 221) argues, values do not exclude the possibility of examining values as observable facts associated with human activity. Easton, therefore, submits that objectivity can be found in value theory. In that sense, football theory of scientific development can be accused of value judgment just as it shares similarities with dependency theory (Frank 1967) and modernization theory (Rostow 1966), including Karl Marx value theory of surplus-value, sociological theory, or what is called a theory of the superstructure, historical materialism, theory of work and theory of self-alienation. These theories are derived from the perceived conditions of the working class or wage laborers as against the capitalists or the owners of the means of production. In the case of Karl Marx, he advocated revolution or political violence as a panacea for the inequality in human existence (Baradat 2008: 156-176). Africa in the same existential economic disparity with the West can trigger a value standpoint in theorization.

Easton (1953) argues that it is deceptive to take value theory for causal theory but in practice, each is involved in the other, however, causal theory seeks to show the relations among political facts. He argues further that the importance of causal theory lies in the fact that it is an index of the stage of development of any science, social or physical, towards the attainment of reliable knowledge. In defense of causal theory in social science, he further posits:

> Although many secondary characteristics distinguish scientific reasoning from common sense, the primary one is the deliberate attempt to bring to the surface what common sense leaves permanently concealed…the accumulation of data through acceptable techniques does not alone give us adequate knowledge...causal theory carries the simple meaning of hypothesis as to when a person claims that he has a theory about the cause of a certain phenomenon (Easton 1953: 54-55).

The football theory of scientific development is largely causal because of its hypothesis that people with rudimentary ideas can be assisted to develop their ideas through an institution that sees the process as a means to develop scientific technology knowledge embedded in its environment. This knowledge is usefully harnessed than allow it permanently concealed as Easton argues. It is scientific to state that societies that were in existence for thousands of years and solved its social and health challenges without external help are most likely to have a residue of the science used to address its previous challenges before the culture that superintends its own in contemporary times. Kateb in his book titled, *Political Theory: Its Nature and Uses* highlighted five essential characteristics of a theory as moral, inclusive, philosophical, general, and orderliness or consistency (Kateb, 1968). He also attempts to address the problem of value and causal theory. The author (Kateb, 1968: 2) argues that all political theorists are first moral in their interest. They seek to persuade, convince, or convert others to a political attitude. Many of them aim to reform or remake political life. The causal theorist, on the other hand, seeks to accumulate or refine political knowledge. Whatever his ambition he will have policy preferences underlying the research. The inclusive nature of theory emerges in the attempt by the political theorist to understand the whole system of politics. As argued

(Kateb 1968: 3) though they may focus their attention on specific moral dilemmas and matters of detailed political practice, their ambition extends beyond that. Political theorist unmistakably engages in philosophy because obvious facts are pondered and elementary questions are asked in which many things that the world takes for granted or takes as settled are subjected to scrutiny. The political theorist stirs up trouble by inviting responses by trying to go back to the source of political life in human necessities. He tries to identify or define the first principles that ought to govern political discourse and tries to locate the political sector of life with the other sectors of life.

The theories of Plato's Republic; Aristotle's Politics; Cicero's Laws to Marsilius's The Defender of Peace; Bodin's Six Books of the Commonwealth; Machiavelli's The Prince; Hobbes's Leviathan; Locke's Two Treatises of Civil Governance; Rousseau's The Social Contract; Hegel's Philosophy of Right; and Mill's On Liberty coalesced on their approach to political life. They are moral (or normative) in intent, inclusive in scope, philosophical in the procedure, and general in principle (Kateb 1968: 4-5). Finally, he argues that the theory must be systematic and orderly in the presentation. Football theory of scientific development is not only systematic in approach but also seeks to subject what is already or almost taken as a given into scrutiny. It seeks to introduce a paradigm shift on the critique of the economic relation between African and the developed nations through a systematic road into science and technological development that focuses on the indigenous innovativeness, which aims to reform or remake the political life of Africans. Therefore, like other theories that are derived from observation, football theory of scientific development emerges having observed some of the practices among Africans and correlating such in other climes as the next section shows are a necessary condition that can transform ideas into products.

Football Theory of Scientific Development Derived from Observation

First, I want to state that Africa is not bereft of "ideas" that can propel discoveries of some basic components needed for scientific development. Secondly, there are many solid minerals as iron, etc that can be turned into finished products. Starting from the educational system that serves as a conveyor of ideas, Africa has not adequately designed her curriculum to elicit creativity and innovativeness right from primary to secondary school level where technical skills are identified and harnessed among students for national technological development as in Asian educational institutions. Suh and Chen (2007: 7) posit that Korea expanded higher education while investing in indigenous research and development. Even if African tertiary institutions are not designed specifically to develop indigenous knowledge like Korea, yet some African scholars[6] who

[6]Dr. Omotuyi Olaposi I. *et al* (2018). of Adekunle Ajasin University Akungab-Akoko, Ondo state Nigeria scientific discovery into Lassa virus nucleoprotein in 2018 is evidence of scientists whose research findings can be developed for market value. Professor Animalu also collaborated with other staff members of the Massachusetts Institute of Technology Lincoln Laboratory at Lexington Massachusetts USA. Lincoln Laboratory is a United States Air Force Laboratory run by America's Premier Technological University – the Massachusetts Institute of Technology (M.I.T), created in 1951 out of the M.I.T. Radiation Laboratory, which worked on the U.S. radar program during the Second World War (Animalu et al 2000: 1 - 5). Dr. E.N.C. Osakwe

worked elsewhere in scientific discovery institutions exhibit that can spur technological development. The problem is that their scientific contributions are not harnessed rather they are celebrated for publishing their research findings in internationally reputable journals where scholars from other countries (for their local market value) quickly harness their findings. This contradicts the notion of tertiary institutions established elsewhere for knowledge economy and even run contrary to the calls by African leaders who have often called on the African Diasporas to bring back their knowledge acquired from the Western world and elsewhere.

This is contrary to India, Japan, South Korea, and Singapore (Lee 2000, Umoren 2001, Almond et al 2004, Timnay 2007). In fact, in Singaporean experience, Lee (2000: 67) posits that "we had to put our faith in our young officers who had integrity, intellect, energy, drive, and application". Positing that their top scholars were chosen from the best of each year's crop of students. They would later be sent to the top universities in Britain, Canada, Australia, New Zealand, Germany, France, Italy, Japan, and America. The experience from these countries suggests that indigenes trained outside the shores of their origin can be recalled to assist to develop local technology or modification of existing knowledge or tools (Okongwu 2007). Mbachu (2009) argued that some soldiers who fought alongside Biafra during the Nigerian civil war of 1967-1970 showed much ability in science and technology during the war that if they are harnessed, can lead Nigeria out of the technological backwardness. Examples are cited of German Jews who defected to the USA, Britain, and even Russia on the annoyance of the German massacre of Jews during the Second World War that helped the countries to develop more on science.

There are instances from the field of health science that reveals that indigenous African people have a contribution to make for science and technology in Africa. Rather than harness these talents, what emerges is controversy over the superiority of knowledge between the orthodox and unorthodox practitioners. For example, Mordi (2010: 4-6) reported a controversy between traditional medical practitioners and orthodox medical practitioners in Nigeria over the use of herbs as a treatment formula in Nigeria. The

was a former member of the National Policy Development center of the Supreme Headquarters, Code-named "Think-Tank". His work shows that Project Development Institute (PRODA) Enugu was established in the East-Central state in 1970 to harness the talents discovered during the Nigerian civil war. The federal government of Nigeria took over PRODA in 1977 rather than consolidate it; there has not been the political will to ensure its success (Osakwe 1979). There are other scholars like Prof Amagh Nduka from the Federal University of Technology Owerri Imo State Nigeria, whose contribution to science is celebrated in the developed world. Philip Emegwali in computer innovation, Dr. Ezekiel Izuogu a researcher and inventor of Z-600 motorcar, in which Eni (2010: 53) shows that 90% of the raw materials for the car was manufactured locally in Nigeria, and Prof Hillary Inyang and many others (African Science 2015). The works of Aaseng (1997), Kessler, Kidd, Kidd, and Morin (1996) show a list of African American scientists whose scientific innovations contributed greatly to American technological development. Latterly we have an indigenous car manufacturing company in Nigeria called Innoson motors, which according to social media is presently using 75% of locally manufactured parts for its production. Tertiary institutions in Africa can through research contribute the remaining 25% or reduce it to 10% through crisscrossing investment.

altercation[7] rages although the World Health Organization (WHO) 2002 launched a comprehensive strategy to assist countries to create an enabling environment for the development of traditional medicine. This would have created a synergy between the Nigerian Natural Medicine Development Agency (NNMDA) and the Medical and Dental Council of Nigeria (MDCN). The argument extends to traditional African bonesetters and orthopedic surgeons (Uche-Okobi 2013: 50). African bonesetters are derided by orthopedic surgeons despite wide knowledge that traditional bonesetters are recognized in countries as China and India and their works are as effective as Africans are.

The Denigration is more obvious in clothing/fashion despite the fact Africa has the potential to produce and supply to her market with foot and clothes wear. Leather from animals and perfect clothe sowing or weaving is common in Africa and even admired by other cultures. However, the production has majorly served as cultural entertainment what is popularly called Aba or Igbo made shoes and clothes denigrated as products for the poor. Bilewomo (2009: 56-58) shows that Aba-made products can provide competitive manufacturing and trading relations with similar products elsewhere especially from Asia and Europe. While the products of these skilled Africans who manufacture drugs from herbs and produce shoes and shirts are accepted in the open market as largely substandard but others with skills in iron smelting, sculpture, or fabrication are often arrested for manufacturing guns used by armed criminals could be harnessed for industrial technological development. Anthropologist/archaeologists including sociologists and every coach in the tertiary institutions can collect data on cultural areas that display these talents and incorporate them as an instrument into applied research for scientific-technological development without necessarily imposing mathematics or English language on them as a prerequisite.

Africa cannot continue to operate what can be referred to as "commerce capitalism" where their industrialists merely serve as trading outlets for either multinational corporations or transnational companies owned by Indian or Lebanese businesspersons. Unfortunately, the Japanese Ambassador to Nigeria in 2013 who responded to the question of what is the balance of trade between Nigeria and Japan said,

> Our trading is expanding, maybe by 70%. But, this due to the recent import of liquefied natural gas (LNG) from Nigeria to Japan. What we import are mostly oil and gas apart from the semi-oil extraction. People have asked why we couldn't

[7]This argument was constructively handled by I. William Zartman in the edited book "Traditional Cures for Modern Conflicts. Citing other scholars who share the same view Zartman (2000: 1-2) argues that "in recent times, medical scientists have turned attention to medicines and healing practices used in precolonial Africa to understand the bases for their effectiveness in modern scientific terms. In some cases, such a study has brought to light new chemical compounds and psychological effects enriching the scientific repertory with previously unknown substances and practices. Without the benefit of modern science, Africans discovered chemical substances through their effects and used them effectively for medical purposes…….in other cases, it turned out that the substances and practices of African traditional medicine were the same as those used today, independently discovered and developed in Africa and other parts of the world".

> import some Nigerian products; you don't have Nigerian products. No manufactured products; you don't have" (Tell 2013: 32-35).

I argued that the response from the Japanese ambassador to Nigeria does not indicate that he is not aware that there are products manufactured in Nigeria but simply because Chinese, Indian or Lebanese companies either own those products. This condition is common in Africa even South Africa where even after Mandela's struggle liberated the black majority politically but the genius of technological development is with the white minorities. Interestingly some African states have specialized Universities of Science and Technology. Their specific role to produce science and technology needed for Africa to catch-up with other continents are yet to materialize. It is erroneous to assume that only students admitted in those institutions can only innovate science and technology while little or nothing is expected from those admitted in other non-specific tertiary institutions. African tertiary institutions should, therefore, adopt a system of sports academies like the one established by Segun Odegbami in Ogun state Nigeria to catch and train young talented footballers, to catch young talented Africans in science and technology. Similar sports academy elsewhere including Pepsi Football Academy that produced John Mikel Obi has produced football talented individuals (Umukoro 2009: 53). Tertiary institutions in Africa should replicate the same emphasizing more skills and ingenuity that captures originalities in social reengineering and physical science, making departmental and faculty seminars as the first laboratories where the ideas will be tested.

Conclusion

This paper argues that indigenous scientific development is needed in Africa. Since such is lacking despite experimenting with several theories meant for economic development and alternative theory emerges referred to as football theory of scientific development to provide a framework for the indigenous scientific-technological development. The theory drew from the principle of football game seeing it as a game that provides a common feeling among diverse ethnic groups within Africa while playing with teams from other continents and best players are sort by team coaches irrespective of ethnic background within nations. The paper shows that Africa has the necessary talents needed to spur scientific-technological development and positions tertiary institutions to harness these talents to complement tertiary institutional focus, which majorly targets producing students that could service the existing industrial and market needs in Africa.

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