

**Centrality of knowledge development to competitiveness in the innovation-driven world:
Addressing Nigeria's lagging performance (Step 1)**

By

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Innovation has become mandatory for survival, competitiveness and growth of individuals, firms, regions and countries in the 21st century. Anyone of these units is easily blown out of its respective competition once innovation slows or ceases, ranging from individuals competing in labor markets, firms competing in product markets, states or regions competing for investments, and countries competing in export markets. In the social or nonmarket economy, innovation can make a difference in how a state manages diversity and prevents conflict, educates its population, provides access to safe drinking water, eradicates disease and reduces hunger. The value created by innovation manifests in new ways of doing things and emergence of new products and processes that contribute to increasing the level of society's well-being. Innovation transforms inner capabilities of individuals, firms, societies and economies, and strengthens their capabilities to learn, adopt and exploit new ideas.

There are many definitions of innovation as are analysts of the subject. However, a more general definition that captures the main essence considers innovation as “the search for, and the discovery, experimentation, development, imitation, and adoption of new products, new production processes and new organizational set-ups.”ⁱ Other definitions associate innovation with application of ideas, knowledge or practices that are new to particular contexts with the purpose of creating positive changes or seizing opportunities. Noticeably, the definitions stress the words “new”, “change” and “improve” in defining innovation.

More than anything else, the quantity and the quality of innovation strongly depend on the depth of the “knowledge economy,” a term which describes the production and application of knowledge to create new processes, products and markets.ⁱⁱ The core of this economy comprises research universities and colleges, institutional and corporate research and development laboratories and programs that produce knowledge, as well as education and training systems that utilize new knowledge to produce more capable workforce that in turn raises the quality of knowledge

produced. This symbiotic core is bolstered by institutions and regulations that protect intellectual property rights and create strong incentives for knowledge production; information and communication technology and other infrastructure that facilitate exchange and reduce the cost of access to frontier knowledge and products; vibrant competitive markets for capital needed for entrepreneurship and commercialization of new knowledge; and a business sector that absorbs knowledge, grows in depth and sophistication, and provides feedback to the core. Together, these factors constitute the pillars of innovation in the Global Innovation Index (GII)ⁱⁱⁱ, co-published annually by Cornell University, INSEAD and the World Intellectual Property Organization (WIPO).

However, an efficiently-managed well-developed statistical system that supports regular surveys and extensive data collection is indispensable for the knowledge economy. Countries that invest extensively in surveys and data collection tend to produce, encourage and attract the best of talents and skills; they produce higher quality of human capital and more scientific outputs, and are more successful at innovation. While it seems clear to many that education is a fundamental factor for development, because knowledge drives development, what seems obscure is that the quality of a nation's education system cannot be superior to the quality of its system of data, planning, research and experimentation. There is a false sense that globalization and diffusion of technology around the world will make up for the gap created by an underdeveloped research and experimentation system. Unfortunately, knowledge produced elsewhere is valuable only to the extent of available knowledge infrastructure and capacity to comprehend, adapt and apply them sensibly in the domestic context.

Among the former British colonies that were endowed with initial potential, India offers a leading example of knowledge-driven development. At independence in 1947, the economy was dominantly agrarian with a [population](#) of 345 million that was the second largest in the world. By 1950, agriculture accounted for 60 percent of the economy while industry and services were 12 percent and 28 percent respectively, and the non-agricultural sector was dominantly informal. However, the country's economic development and transformation had been [quicker](#) than the developed world and more [balanced](#) than China's, despite a larger share of microenterprises that, by design, minimizes opportunities for economies of scale. Since 1965, India's GDP growth rate has risen on a [decadal](#) basis and is currently among the highest in the world. By 2014, the share of

agriculture declined to 14 percent as industry and services grew to 28 percent and 58 percent respectively. Often regarded as the largest democracy in the world, India was ranked by Forbes as the best emerging [market](#) in 2014, numbers among the current top [destinations](#) for medical tourism, and has 3 of its leading companies [ranked](#) among the top 100 innovative companies in 2015. These include a consumer good company ranked 41st, its largest information technology company ranked 64th and its largest pharmaceutical company ranked in the 71st position.

This performance is by no small measure driven by a strong knowledge economy which began to develop prior to independence, and the Indian Statistical Institute (ISI) played a major role in its evolution. Growing out of a statistical laboratory that dates back to the 1920s, the ISI was founded in 1931 as “a [learned](#) society,” led by an Indian national, with the objective to carry out research, teaching, training and development projects in all sectors of the Indian economy. Through its pioneering engagement in agricultural experiments, large-scale surveys, statistical quality control and national development planning, the institute became integrated into the Indian statistical system, which had been in existence since [1862](#). After gaining independence in 1947, the government demonstrated its commitment to the knowledge economy through an Act of Parliament declaring the ISI an *Institute of National Importance* in 1959 and granting the right to award degrees and diplomas in statistics. After satisfying the human resource needs of national, state and district statistics departments, trained statisticians spilled over into quality control and improvement jobs in industry, ranging from manufacturing to healthcare. Due to this head-start over other developing regions in data and statistics, India became a foremost attraction to academic researchers from the developed world interested in less-developed societies, and consequently, provided a leading context for the formative period of development economics research.

Although the green revolution originated in [Mexico](#) in the 1940s, its adoption and greatest success around the world took place in India beginning in mid-1960s, aided by an existing system of experimentation and research that grew out of the ISI. Further technical advances in agriculture enabled a structural transition in which the share of agriculture in total employment declined [commensurately](#) with its share of value addition. The benefits for poverty reduction were evident. Although India is home to the largest number of poor people than any country in the world, [estimated](#) at 273 million in 2012, its poverty incidence dropped [from](#) 56.4 percent in 1973 to 21.9 [percent](#) in 2012, a rate that was considered one of the [lowest](#) among countries with the largest

numbers of poor people. The informal share of the economy dropped from 40 percent in 1950 to 20 percent in 2008^{iv}.

In contrast, Nigeria offers example of a former British colony endowed with similar potential for knowledge-driven development but instead pursued a path of “dependent” development. At the time of independence in 1960, agriculture accounted for 64 percent of the Nigerian economy while industry and services were 10 percent and 26 percent respectively. By 2014, agriculture was down to 22 percent of the economy, with industry and services accounting for 25 percent and 53 percent respectively. However, the transition was anything but balanced; poverty rates increased from less than 30 percent in the 1970s to 69 percent in 2012 and is estimated, after methodological revisions, at 33 percent in 2013.

Efforts to establish a statistical system began^v in 1928 when the British Colonial government established a statistics unit in the office of the Colonial Secretary in the Cabinet Secretariat. In 1947, a statistics section was created in the Customs and Excise Department which was afterward transformed into a full-fledged Department of Statistics. The Department of Statistics was subsequently expanded to form the nucleus of a central national statistics office. The Statistics Act of 1957 provided for a decentralized statistical system and collaboration between the central and regional statistical offices. At independence in 1960, the Department was moved from Customs and Excise to the Federal Ministry of Economic Development and was renamed the Federal Office of Statistics (FOS). In the post-independence period, the statistical system was underfunded, under-appreciated and was not taken as a serious source of information essential for national development. Subsequent changes to the system including the shifting of responsibility for financial statistics to the Central Bank and demographic and health statistics to the Nigerian Population Commission, and the abolishing of the common statistical system in the 1980s, served to weaken the statistical system and rendered it irrelevant. In spite of reforms and restructuring leading to creation of the National Bureau of Statistics in 2007, the current statistical system remains weak and underfunded; most of the recent development surveys are funded from external sources. Regular surveys conducted by the bureau have little depth and usefulness.

The lackluster attitude toward domestic statistical system and the knowledge creation it facilitates is a reflection of the culture of “knowledge dependence” that pervaded the mindset of government and policymakers. The idea, which dominated the African independence era of the 1960s and has

had lingering effects thereafter, was that the stock of scientific knowledge required for economic progress existed in the developed countries and simply needed to be transmitted to the developing countries in order for them to develop.^{vi} Instead of experimentation and research in agriculture, for example, it was believed that only extension agents were needed to persuade farmers to adopt better technologies available elsewhere. Thus, technical advancement in agriculture was pursued simply by expanding agricultural extension workforce. To this end, African countries hired additional 36,000 extension agents between 1959 and 1980.^{vii} While the research and experimentation system that had been well developed in India prior to the green revolution enabled understanding, adaptation and application of the high-yielding varieties that emerged, Nigeria and other African countries missed the opportunity to benefit from the movement due principally to lack of requisite capacity. This attitude almost systematically neglected the importance of building-up of local capacity and ownership of productive and applicable knowledge.

The consequences of this neglect are dire at many levels. The country has a large number of universities but policymaking relies dominantly on “schools of thought.” The number of Nigerian universities increased from 5 in the immediate post-independence era in 1962, to 51 in 2005 and more rapidly to 129 in 2014 as a result of licensing of private universities.^{viii} As at 2012,^{ix} there were 37,504 academic staff in the public university system, and teaching staff to student ratio was on average 1:33^x but reached as high as 1:122 at the University of Abuja. Annual academic publications were 0.2 per capita, 83 percent of which were published in journals created by the teaching department of the author or in local journals that have no visibility, while the remainder appeared in international journals, majority of which are pay-to-publish outlets that rarely rank among those frequently consulted by policymakers and development partners. Public and university-level research grants are rare, and when are available, they are paltry sums that barely cover basic research costs. Over the years, the neglect of data and research has weakened the quality of university graduates. Research projects typically required for undergraduate degrees are increasingly written by online consultants and academic supervisors (in exchange for fees) or copied verbatim from existing research. Employers of labor increasingly require graduates to sit for qualifying examinations and, increasingly, are forced to retrain new recruits in order to bring them to the level of knowledge they ought to have attained in the university. Companies that find those efforts costly simply refuse to hire new graduates; most advertisements for jobs that fresh graduates were hired to do in the past now emphasize years of work experience, leaving most

graduates *unemployable*. The global ranking of universities reflects this condition. While an Indian educational institution was [ranked](#) in the 251-300 range, the foremost and premier Nigerian university was ranked in the 601-800 position in the recent list of the top 800 universities and colleges.

Data from the Global Competitiveness Index (GII) presented in Table 1 also provides empirical support to the divergence between the two countries in knowledge-driven development. India was ranked in 67th position out of 141 countries on “quality of vocational training”, a sharp distinction from Nigeria’s rank of 139th on the same index. India and Nigeria are wide apart in terms of the culture of research and experimentation, and consequently the culture of innovation, whether measured by R&D expenditures (India 52; Nigeria n/a), scientific publications (India 21; Nigeria 67), international co-inventions (India 59; Nigeria 120), research institution prominence (India 8; Nigeria; 59) or multi-stakeholder collaboration (India 36; Nigeria 114). On all these counts, India ranked among the top 60 countries while Nigeria ranked among the average and bottom half countries.

The quality of knowledge systems affects not only the education system, but also the efficiency of health and economy-wide production systems and labor markets, thus affecting the capacity of the economy to attract and retain talents. On the basis of labor market hiring and firing practices, Nigeria ranked 18th while India ranked 42nd position in the GCI. While both countries are large in population and provide large markets for entrepreneurs, the more competitive aspects of the Nigerian labor market do not seem enough for talent retention in the absence of strong health system, high quality education system, vibrant enterprise capital market and a sound legal system for businesses, to mention a few. The positions of India and Nigeria are also distinct in terms of governance and institutions that support the knowledge economy. India ranks in the top 55 on account of judicial independence, efficiency of legal system, and budget transparency. On the same indices, Nigeria’s position was clearly near the bottom. India is well positioned among the most developed *enterprise capital market* in the world, ranking in the top 30 in both venture capital market development and financing of SMEs. Again, Nigeria ranked in the bottom 30 on those indices. The divergent rankings in *business sophistication* also signal differences in the strategies pursued by the two countries. While India is evidently achieving *competitive* advantage through

value chain deepening and business cluster development, Nigeria seems to remain firmly in the regime of *comparative* advantage.

Table 1: Extracts from the Global Competitiveness Index 2019			
Factor	Indicators	Rank (/141)	
		India	Nigeria
Aggregate Index		68	116
Skills	Quality of vocational training	67	139
	Extent of staff training	50	102
	Skillset of graduates	93	139
Innovation Capability	R&D expenditures	52	n/a
	International co-inventions	59	120
	Scientific publications	21	67
	Research institutions prominence	8	50
	Multi-stakeholder collaboration	36	114
Labor market efficiency	Labor tax rate	93	55
	Hiring and firing practices	42	18
Institutions	Judicial independence	51	99
	Budget transparency	51	83
	Incidence of corruption	66	121
	Efficiency of legal framework in challenging regulations	39	119
	Efficiency of legal framework in settling disputes.	53	103
Financial Market Development	Availability of venture capital	22	133
	Domestic credit to private sector	70	129
	Financing of SMEs	23	127
	Soundness of banks	89	103
	Non-performing loans	106	126
Business dynamism	Cost of starting a business	95	116
	Time to start a business	90	64
	Growth of innovative companies	33	57
	Companies embracing disruptive ideas	33	58

In spite of the lagging performance of Nigeria in this context, opportunity exists for catching up. However, Nigeria will not move to the frontier by simply importing technology. Neither will it

catch up by simply harping on science and technology, a pattern that has a history of its own. What is required is to reverse the neglect through a set of well-targeted reforms, policies and programs that are focused on the knowledge economy.

The starting point is a wake-up call to the university system. An inspection of the mission statements of prominent Nigerian universities shows the centrality of innovation, high quality education, and needs of society to their existence. This is captured with statement such as “expand the frontiers of knowledge ... produce graduates who are worthy in character and sound judgment ... contribute to the transformation of society through creativity and innovation” (University of Ibadan); “research and development, innovation, knowledge transfer and human resource development, ... responsive to the needs of the society” (University of Nigeria, Nsukka); “new ideas and intellectual practices relevant to the needs of its immediate community, ... advance the frontiers of learning, through teaching, research and the dissemination of knowledge of the highest quality.., to produce high-level human power and enhance capacity-building..” (Ahmadu Bello University Zaria); “application of modern technology to teaching, research and community service, and its provision of practical solutions to social, cultural and economic problems, ... advancement of knowledge and its practical application to social, cultural, economic, scientific and technological problems” (Obafemi Awolowo University, Ile-Ife).

However, the wake-up call will fall on deaf ears unless three critical challenges confronting the university system are taken seriously and addressed with a sense of urgency that they deserve. These are governance, standards and funding in decreasing order of importance and degree of urgency. Reversing or altering the order amounts to positioning the cart before the horse!

Governance is the most important challenge. As the primary foundation of the knowledge economy, the university system requires self-regulation that is only sustainable through self-governance, and stability that is realizable through insulation of the university system from the political system. The starting point in this regard is for the federal and state governments to abolish the practice of meddling in appointment of principal officers of the universities, including vice chancellors and members of university governing councils. Although theoretically possible, it is difficult in practice, for a vice chancellor appointed on the basis of political patronage to resist appointment, promotion, enrolment of students and discharge of oversight duties on the same basis. While the distortionary effects of political patronage on incentive systems are generally non-

trivial; the perverse incentive effects are most pronounced and most destructive in knowledge creation environments. In recognition of this sensitivity, the right to self-governance of universities is considered a fundamental right. This recognition is reflected in Section C, Articles 11 and 12 of the Kampala Declaration on Intellectual Freedom and Social Responsibilities (1990) of the International Human Rights Conventions and Declarations, which [state](#):

“Institutions of higher education shall be autonomous of the State or any other public authority in conducting their affairs, including the administration, and setting up their academic, teaching research and other related programmes. The autonomy of institutions of higher education shall be exercised by democratic means of self-government, involving active participation of all members of the respective academic community.”

The current practice where professors lobby (some practically prostrate themselves to the ground) politicians and ministers for appointment to the position of vice chancellor is shameful, and is both inconsistent and incongruent with the natural pride of the university system in its professional independence, progression by merit and advancement through creativity. In progressive countries, appointment of the chief executive of a university begins with the search committee and ends with the governing council, not “the Minister of Education in consultation with the National Universities Commission.” The argument perennially advanced to support the current practice is “he who pays the piper dictates the tune,” that is, if government funds an educational institution, it should have a say in who heads it, a diversionary code phrase for political patronage! Of course, this will only be heard in countries where governments simply think about *giving* education to its population in order to reduce illiteracy rate or fertility rate (typical among Africans!). It will never be heard in countries where the university system is regarded as foremost to creativity, innovation and international competitiveness (ask South Koreans!).

Once self-governance is settled, the next challenge is establishing and enforcing strong academic standards in terms of who gets in, the quality of instruction they receive and the quality of research produced in the universities. These are the most important issues that keep the leaders of world leading universities awake at night. It is not every secondary school graduate that should be admitted into universities; it is the top ranking ones who should make it there. Currently, an average or bottom-ranking secondary school graduate can make it there if his/her parent is connected or knows somebody who is connected to a principal officer of a university. All that is required is for the applicant’s name to show up on the JAMB/UTME list of applicants by whatever means. If the students would not ordinarily make it to the list, the parents could buy a slot in it, or

if that is difficult, they could enroll the ward in an examination center where cheating is not corruption! Some universities have made post-UTME exam mandatory in order to weed out such kids from getting in, but there are many challenges to the algorithms. The private universities are there to admit kids rejected by the public universities once the parents can afford their fees. So, the kids who should not be in the university are there, Pronto! The second area where standard is essential is the quality of instruction and mentoring offered at the universities. The most important concern of governance of leading universities is summed up in the question “what do we make of these smart kids?” The university system works like any other production system that transforms input into output. Academic and teaching staff that are not close to the frontier of knowledge cannot produce graduates that are ready for the emerging world of work.

Nigerian universities are full of several kinds of characters. Some characters do not show up in class until few weeks to end of semester; a phenomenon that started in early 1990s when economic conditions became hard-hitting and full-time lecturers worked effectively as part-time instructors in their position, and continues today. There are some who simply dictate lecture notes they wrote 10 to 15 years prior when they were undergraduates taking the classes they are now teaching. Some classes have no textbooks, students are only required to read the lecturer’s handout. Some recommended and required textbooks are 20 years or more behind the frontier of global knowledge. When it comes to examinations, the best students are those who can repeat verbatim what the lecturer said or dictated in class, or wrote in the handout, word-for-word, definition-for-definition, illustration-for-illustration. The university system has a very weak or no mechanism at all that allows students to evaluate their instructors, neither does it have a system that regulates the standard of publications required for academic staff progression. Departments and programs in good universities around the world have standard lists of reputable, ranked journals, a list of which is provided to all academic staff, where publications would be regarded as meeting a particular standard, along with numbers expected to be published in specified categories in order to be promoted. The practice in Nigerian universities to simply count the number of publications creates perverse incentives that have severely limited scholarship. The falling standard of education in Nigeria is well acknowledged by parents and employers. However, the decay is not the result of any form of genetic mutation in the population, where invasion of the country by “less smart” aliens during the last 20 years is perhaps responsible for reduction in the proportion of smart kids in the population. The fault lines are in the quality of intakes and the quality of instruction.

Once self-governance and standards issues are resolved, the university systems is now set for its original mission of generating innovation, producing high quality graduates, and addressing the development challenges of society. Resources from government and industry in the form of research, conference and professional development grants are needed to spur innovation. Institutions that fund research, experimentation and surveys such as National Science Foundation and National Institutes for Research and Experimentation should be established, alongside efforts to develop the capacity of National Bureau of Statistics (NBS) to undertake regular large-scale surveys. An Act of parliament that declares these institutions as “*Institutions of National Importance*” may be helpful, but essentially they must create the mechanism to fund the institutions through regular statutory allocations from the government. This challenge must not be left for the Federal Government alone to tackle, States must do the same. From historical experience, government takes the lead in funding research and development while industry takes the back seat. Once a threshold of capacity for innovation is attained, the private sector typically moves to the front seat afterward.

Once the core of the innovation economy is strong and productive, the remaining pillars typically begin to develop and build on the foundation. Enterprise finance markets that provide capital for young entrepreneurs,^{xi} and venture capital markets are more likely to be deepened as capacity for innovation improves. The business economy transforms gradually and so does the technological structure of the economy. And the process continues. As the popular Pizza Hut advertisement goes, “people gather around the good stuff!”

ⁱ West, M. A. and Anderson, N. R. (1996). Innovation in top management teams. *Journal of Applied Psychology*.

ⁱⁱ The production and application of knowledge is often captured by science and technology in many contexts, especially in government and policymaking circles.

ⁱⁱⁱ Cornell University, INSEAD, and WIPO (2015): *The Global Innovation Index 2015: Effective Innovation Policies for Development*, Fontainebleau, Ithaca, and Geneva.

^{iv} Elgin, C. and Oztunali, O. (2012), “Shadow Economies around the World: Model Based Estimates,” Unpublished Manuscript, Department of Economics, Bogazici University, Istanbul

^v Akinyosoye, V. 2008. Repositioning the National Statistical Systems of African Countries within the Framework of International Best Practices: The Case of Nigeria, *The African Statistical Journal*, Volume 6: 191-220

^{vi} To be fair, this attitude was not deliberate, but was more essentially the outcome of two factors: a blind attachment to the prevailing paradigm and a mindset that believed in “free lunch!” On the first factor, African leaders bought wholesomely into the prevailing United Nations scientific agenda, which was driven by a “Good Samaritan” motive of facilitating application of science and technology in the less developed countries. The efforts began with the New York scientific conference on the conservation and utilization of resources in 1949, only 4 years after the creation of United Nations in 1945, and continued through the Geneva conference on the application of science and technology for the benefit of the less developed areas in 1963, as well as the Vienna conference on science and technology for development in 1979. On the second, African leaders tended to treat technology as manna from the developed world!

^{vii} Eicher, C. K. and M. Rukuni. 2003. The CGIAR at 31: An Independent Meta-Evaluation of the Consultative Group on International Agricultural Research. Thematic Working Paper. Washington: World Bank.

^{viii} Peter Okebukola, Towards a national strategic vision for Nigerian universities, Presented at the 2014 Executive Education Program for Vice-Chancellors organized by the Association of Vice-Chancellors of Nigerian Universities, Uyo, November 19-20, 2014

^{ix} Committee on Needs Assessment of Nigerian Public Universities, Presentation to the Council Chamber, State House, Abuja Thursday 1st November 2012

^x The public university system had 37,504 academic staff and a student population of 1,252,913.

^{xi} For example, the government, with support from development partners, has taken a first step in this direction through the Youth With Innovation in Nigeria (YouWiN!) program. However the reach among the potential entrepreneurial population remains very limited and the financial services sector is yet to move along with the efforts.