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Human Capital, Institutions and Innovation: An Anecdote of Two Countries

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Abstract: Statistics from World Development Indicators (WDI) show that the GDPs of South Korea and Nigeria were US$4.7 billion and US$5.2 billion, respectively as at 1967. However by 2009, South Korea had advanced leaving Nigeria behind by US$665 billion. With respect to innovation, measured by the amount of scientific publications, Nigeria was ahead of South Korea by 79% in 1985. By 2009, South Korea was already ahead of Nigeria by over 4,000%. With the aid of descriptive analyses, this study examined the factors responsible for these gaps by comparing both countries using data from the WDI and Worldwide Governance Indicators (WGI). The results affirm that human capital, institutions and innovation are factors responsible for the differences between both countries. This study concluded by drawing our relevant recommendations for development of Nigeria.

Key words: Human capital, innovation, factors, Nigeria, South Korea

INTRODUCTION

It has been generally accepted that economic growth is insufficient to define the success of an economy, after all, an economy may be growing in terms of its income but not progressing in vital aspects such as institutional quality and innovation outcomes (Soubbotina and Sheram, 2000; Ray, 2010; Spolaore and Wacziarg, 2013). Hence, it is insufficient to advocate for economic growth. This is why, it is crucial to ensure that the development sought for is the kind that is sustainable. To attain such the quality and capacity of human capital has to be enhanced. It takes a stock of human capital to drive sustainable development. But, that in itself is not sufficient. Human capital in itself has to be optimally engaged and empowered to create invent and innovate. Thus, opportunities must be created to allow people express their ingenuity with minimal restrictions. This is why, the place of human capital development within a strong institutional framework cannot be underestimated in the development process.

Human capital which is a catalyst for innovation cannot operate in isolation from strong and development-enhancing institutions. Evidence from existing studies proved that innovation hardly thrives in an environment lacking good governance, transparency and protection of intellectual property rights (Blind, 2012; D'Este *et al*., 2012; Oluwatobi *et al*., 2014). It is also validated that human capital is a factor that drives innovation and development (Chi, 2008; Teixeira and Fortuna, 2010; Ang *et al*., 2011; Zhang and Zhuang, 2011; Mariz-Perez *et al*., 2012; Kato *et al*., 2015). It is people that innovate; not things. Hence, the quality of human capital determines the quality of the innovation emanating from the economy. The capacity of the people to think, generate new ideas and employ them to improve products, processes and models is vital to innovation-driven development.

Comparing advanced nations with developing nations reveals that more investments are made in human capital development in advanced economies than in developing economies. Developing economies that have natural resource endowments and depend on them as primary drivers for economic sustenance, have shown tendencies to ignore significant investments in human capital development (Oluwatobi, 2015). These economies simply deprive their populace of their ability to contribute to the development process.

Previous studies on this subject have examined human capital effect on technological convergence among low, middle and high income economies (Ang *et al*., 2011), the relevance of human capital as a driver of innovation (Mariz-Perez *et al*., 2012), the role of innovation enablers in facilitating innovation (Camps and Marques, 2013), strengthening innovation through human capital development in Malaysia (Azizan, 2013) among others. Ang *et al*. (2011) found out that human capital has increasing effect on innovation only for high and middle income countries. Mariz-Perez *et al*. (2012) contributed mainly by developing a set of pointers for human capital management for the purpose of allowing for clarity in the relationship between human capital and wealth creation. Their study depicts that the process of innovation depends on the integration of human capital into

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productive realities. Camps and Marques (2013) concluded that human capital has a mediating role in favor of innovation; hence, corroborating the positive effect human capital has on innovation. Azizan (2013) also has a similar conclusion for Malaysia.

This study, however, adopts a different approach to examining human capital and innovation by exploring and comparing two countries; Nigeria and South Korea in terms of their economic performances as well as factors responsible for the variance in their economic performance. What informed the choice of these two countries is the fact that the two of them were both developing economies that started with similar real GDP per capita in the early 1960s. However, the gap between them clearly positions South Korea as an advanced economy at present. Why is there an obvious gap in economic performance between both countries? What is responsible for the obvious gap? What are the lessons for Nigeria to catch up with South Korea? These are some of the questions this study tried to provide answers to.

MATERIALS AND METHODS

An anecdote of Nigeria and South Korea: Statistics validate the fact that South Korea generates twelve times more GDP per capita than Nigeria; its people live 32 year longer than Nigerians; it invests twenty-five times more on human capital than Nigeria and its people have over sixteen percent more chance of being employed than the Nigerian people. Yet, these two countries were at par in the 1960s. The World Bank's Development Indicators reported that the GDPs of South Korea and Nigeria were US$4.7 billion and US$5.2 billion respectively in 1967. However, by 2009, South Korea had leapfrogged to US$834 billion leaving Nigeria behind by US$665 billion in the same year. With respect to innovation, Nigeria was ahead of South Korea by 79% in 1985. By 2009, South Korea was already ahead of Nigeria by over 4,000%.

In the global nominal GDP ranking for 2015, South Korea ranked 11th in the world while Nigeria ranked 23rd. Thus, South Korea is noted as one of the advanced economies in the world however, it did not start that way. The nation has gone through economic setbacks as a result of wars and the Asian financial crisis of 1997 yet, it sprung out of these and emerged one of the advanced economies in the world and a member of the G-20. It had a per capita income lower than Mozambique in the early 1960s but it is currently richer than Spain and New Zealand (Noland, 2012). This study identified three factors responsible for this dramatic economic transformation. They include human capital, institutions and innovation.

Human capital has been regarded in literature as one of the elements responsible for the transformation of economies (Mankiw *et al*., 1992; Romer, 1994; Fernandez and Mauro, 2000; Shindo, 2010; Hanushek, 2013; Jalil and Idrees, 2013; Lee and Malin, 2013; Pan, 2014). It is logical to agree that it is people that make places and not otherwise. It is the quality of the people (not just the quantity) that defines the worth of an economy. The quality of people in this context refers to human capital which defines the capabilities of people to learn, create, innovate and contribute to the development process.

Evidence from literature shows that human capital is one of the factors that defines the difference between advanced and developing as well as rich and poor countries (Maksymenko and Rabbani, 2008). This can further be buttressed by the findings and postulations of Sen (1999) who defined poverty as deprivation of people's capabilities by depriving them of quality education and healthcare. In addition to these facts, the new growth theory posits that human capital is not subject to diminishing returns unlike physical capital (Schutt, 2003). Thus, the returns on investment in human capital are usually more rewarding than physical capital. Physical capital in itself is the result of human capital.

Institutions also affect growth and development outcomes in economies. Literature reveals a direct correlation between institutional quality and economic development (Bruunschweiler, 2008; Lee and Kim, 2009; Asadullah *et al*., 2014). Moreover, the quality of institutional environment affects the degree to which human capital contributes to innovation outcomes as well as development (Chi, 2008; Teixeira and Fortuna, 2010; Ang *et al*., 2011; Zhang and Zhuang, 2011; Mariz-Perez *et al*., 2012; Kato *et al*., 2015). For instance, the quality of institutions affects the degree of protection of intellectual property rights and the extent to which human capital is retained and employed to contribute to development.

Innovation is also a factor that affects economic progress. Literature confirms that innovation is a core engine for economic development (Hasan and Tucci, 2010; Luo *et al*., 2014; Farhadi *et al*., 2015). It has also been proven that the most advanced economies are the ones that put innovation at the centre of the development process (Romer, 1994; Hasan and Tucci, 2010; Oluwatobi, 2015). This drives such economies to invest in education and provide the enabling environment for ideas to be transformed from concepts to products to markets. It can be deduced from this that innovation is a hub that motivates the engagement of human capital and institutions for development.

RESULTS AND DISCUSSION

Descriptive analysis of Nigeria and South Korea: A descriptive analysis of human capital, institutions and

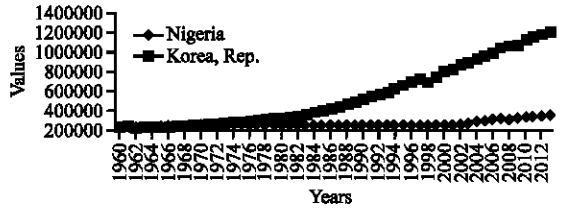

Fig. 1: Level of real GDP for Nigeria and South Korea (US$ 'millions): world development indicators 2014

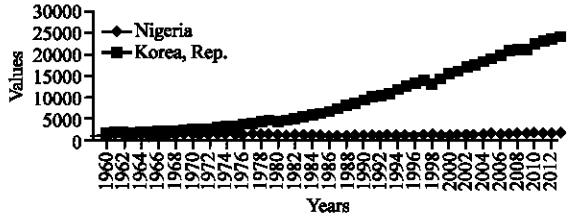

Fig. 2: Level of real GDP Per capita for Nigeria and South Korea (US$); world development indicators 2014

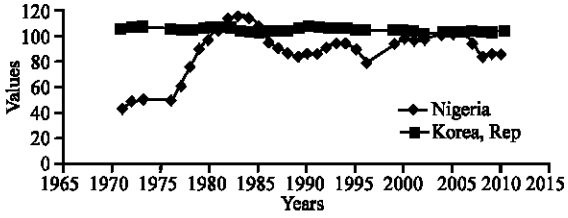

Fig. 3: Primary school enrollment rate; world development indicators 2014

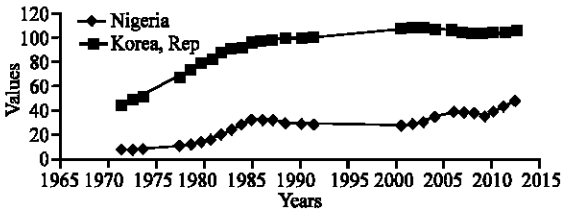

Fig. 4: Secondary school enrollment rate; world development indicators 2014

innovation for Nigeria and South Korea using data from WDI and WGI. These are presented in tables and figures in order to examine the economic performance as well as the factors responsible for the variance in economic performances of both countries. The purpose of the descriptive analysis of the factors is to identify gaps between both countries as well as derive findings from which lessons can be drawn for Nigeria.

Figure 1 shows the economic performance of Nigeria and South Korea as measured by real GDP from 1960-2013. It shows that both countries had similar economic performances in the early 1960s. By the late 1960s, South Korea gradually left Nigeria behind until there was a clear difference in the 1970s. By the 1980s, South Korea took an upward surge, thus, further widening the performance gap between both countries. The concern is "Why the increasing gap between the economic performances of both countries"?

In order to ascertain that this assessment is not misleading, we employed real GDP per capita as a measure of economic performance. This is presented in Fig. 2. The diagram in Fig. 2 did not only validate the trend in Fig. 1, it clearly showed the level of development given that it captures real output per head. As shown in Fig. 2, Nigeria seems not to have grown economically since 1960; real output per head has maintained similar levels annually for 53 year, unlike South Korea, which has maintained consistent upward movement.

This obvious gap is a concern that needs to be addressed. What did South Korea do differently from Nigeria? What did Nigeria not do right? World Bank (1998) tried to provide an explanation for such gaps by comparing South Korea with Ghana. Their explanations for the gaps include two main factors. First is the increase in capital (human and physical); second is knowledge (technological progress). This study leverages on these by identifying human capital, institutions and innovation as the major factors responsible for the varying performance between both countries; hence, it examines the behaviour of these factors for each country. South Korea invested massively in the 1960s in order to turn its bulgy young population into the economic engine that would drive its economy 20 years later. It is currently identified as one of the countries having the highest school enrollment rate at the primary, secondary and tertiary levels. The high level of enrollment at all levels is an indication of a large pool of human capital required to drive sustainable development.

Figure 3 indicates that school enrollment rate in South Korea surpasses that of Nigeria. The same is true for school enrollment at the secondary and tertiary levels. These are clear indications of the appetite for education and the priority given to human capital development in South Korea.

Comparing Fig. 3 with Fig. 4, the level of school enrolment rate is lower at the secondary level for both countries, which could be as a result of non-free education at the secondary level unlike the primary level; this is besides cost of education, accessibility to schools and interest in education in each of the countries.

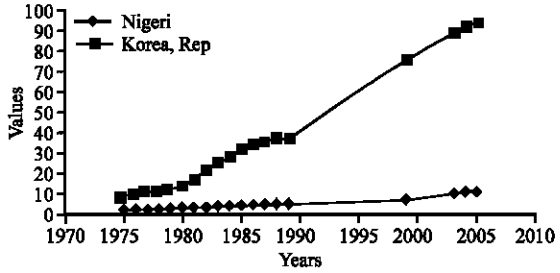

Fig. 5: Tertiary school enrollment rate; world development indicators 2014

The gap between both countries at the tertiary level is the most unique. Figure 5 shows an increasing gap between both countries with time, thus, depicting South Korea's increasing hunger for education and the priority parents in South Korea place on their children's education. On the other hand, the appetite for tertiary education in Nigeria has been almost constant since 1975 until it hit the 10% mark in 2005 as depicted in Fig. 5. The variance between both countries raises concerns, given that tertiary education in both countries is not free. Other factors, apart from cost, are thus responsible. These include social status, marriage prospects and the chance of being gainfully employed. These factors could also be applicable in Nigeria but not in the same degree as in South Korea.

Both countries had similar backgrounds with similar economic performances as at 1960; yet the difference between their economic performances increasingly broadened with time. Assessing the quality of the population, as measured by primary, secondary and tertiary school enrolment rates, depicts that the level of human capital between both countries is a factor responsible for the variance between both countries' economic performances. Figures 3-5 clearly shows that the commitment of South Korea to improving the level of human capital surpasses that of Nigeria; this is reflected in the poor economic performance of the Nigerian economy when compared to South Korea. These indicate that the level of human capital affects the level of economic performance.

Assessing the quality of institutions is also crucial in finding out what is responsible for the variance between the performances of both economies', given that institutional environment determines the level of human capital contribution to the development process. Figure 6 which is a diagram showing the quality of regulations in both countries, depicts South Korea as having greater regulatory quality than Nigeria. On a scale from 1-6, Nigeria did not meet the average mark of 3.5 in regulatory quality. This indicates the weak ability of the Nigerian

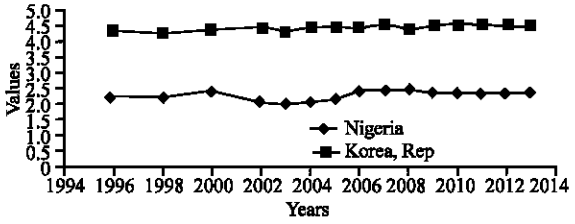

Fig. 6: Estimate of regulatory quality; world governance indicators 2014

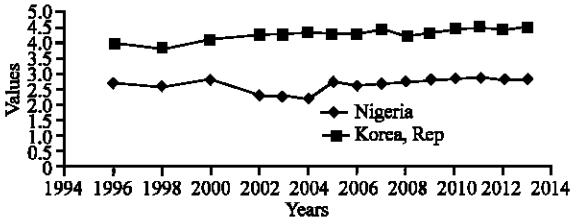

Fig. 7: Estimate of rule of law; world governance indicators 2014

government over time to develop and implement sound and astute policies and regulations that enable development. It also indicates that there are regulations and policies in Nigeria that impose burdens on businesses and stifles opportunities for the expression of human ingenuity to create, innovate and contribute to development. This factor, thus, is also responsible for the low economic performance of the Nigerian economy when compared with South Korea.

Nigeria can therefore, improve on its economic performance as well as its level of human capital, by paying attention to creating an enabling institutional environment for the expression of human ingenuity, freedom of enterprise and the development of the private sector. The inference from Fig. 6 is validated by Fig. 7 which clearly shows similar variance between both countries. While South Korea surpassed the average mark of 3.5, Nigeria's institutional quality (as measured by rule of law) hovered between 2 and 2.5. This indicates that the law is not perceived as supreme in most cases in Nigeria, thus, suggesting that arbitrary decisions of officials of government, instead of the law, govern the nation at the expense of the nation but in the interest of few.

South Korea's institutional quality, as depicted in Fig. 7, shows that the law is supreme in most cases for the benefit of the populace and the nation as a whole. The level of institutional quality also explains the variance in economic performances of both countries. Thus, South Korea has a more developed and wealthy economy (Fig. 2) than Nigeria because it has better institutional quality when compared to that of Nigeria.

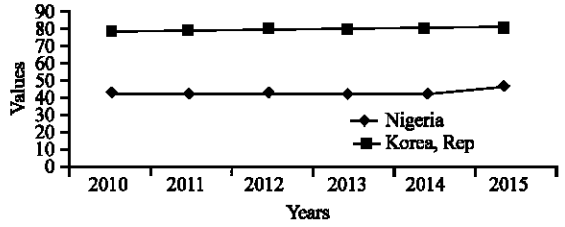

Fig. 8: Ease of doing business scores; doing business 2014

Data from doing business World Bank Group which assesses the efficiency and quality of regulations was employed for robustness as well as to validate the institutional performance of both countries. This data captures the quality and efficiency of regulations governing starting a business, accessing construction permits, paying taxes, accessing electricity, registering properties, trading across borders, protecting minority investors, enforcing contracts, and accessing credit. The data, thus, capture the extent of corruption, the effectiveness of the government in implementing favourable policies and laws as well as the quality of regulations affecting economic activities. As presented in Fig. 8, South Korea performed better than Nigeria throughout the period presented. In 2015, for instance, South Korea scored 83.4 points out of 100 while Nigeria scored 47.3 points.

This clearly shows that South Korea currently provides a better institutional environment that favours economic activities, competition and enterprise above what obtains in Nigeria. This validates the results from Fig. 6 and 7.

To bridge human capital and institutional quality together, in terms of their role as factors responsible for the economic performance of both countries, the level of research output (innovation) was considered the third factor employed to provide explanation for the variance between both economies. Besides, innovation-driven economies have been identified to be more economically advanced than economies that depend mostly on primary production (Oluwatobi, 2015). Scientific and technical journal publications are employed to measure innovation in this study. The reason for this choice is that it helps to capture innovation beyond engineering, pure and natural sciences which are captured using patents. The limitation of using patents to measure innovation is that it leaves out innovation outcomes in other fields of study which are unrelated to pure and natural sciences (Oluwatobi *et al*., 2014). Figure 9 which is a diagram showing the level of research output in both countries shows a very high performance at present for South

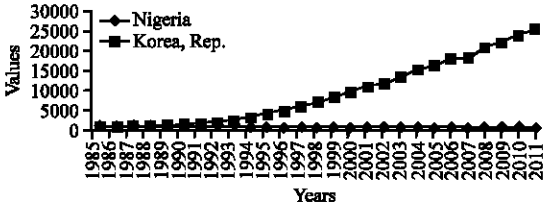

Fig. 9: Level of research output; world development indicators 2014

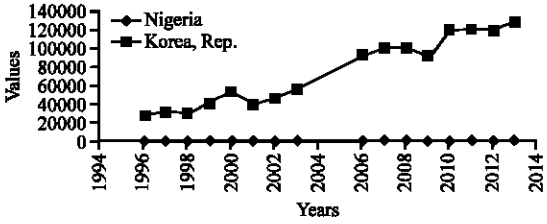

Fig. 10: Level of high-technology export; world development indicators 2014

Korea while Nigeria's level of research output has been at the ground level since 1985 to date. This is a clear indication of shortage of highly-skilled human capital in Nigeria with the capability to research, create, innovate and invent solutions for development purposes. Moreover, it shows the presence of weak institutions in Nigeria.

Though South Korea began at similar levels of research output as Nigeria in 1985, it has surpassed Nigeria by investing massively in research and development that contributes to development. This is a clear indication that the level of innovation is a crucial factor responsible for the variance in economic performances of both countries. In order to validate this, the trend of high-technology exports was employed. This is shown in Fig. 10. The diagram shows similar trends depicted in Fig. 9, thus, validating Nigeria's unprogressive level of innovation over time and South Korea's increasing level of innovation over time.

It can, therefore, be asserted that innovation is a vital factor responsible for the differences in economic performance of Nigeria and South Korea. It also is a reflection of the level and quality of human capital and institutions in both countries.

Lessons for Nigeria: This study shows the variance in economic performance between Nigeria and South Korea as well as identifies human capital, institutions and innovation as three major factors responsible for such variance. The high performance of South Korea and the lack thereof in the Nigerian case provide some insights, which serve as lessons for Nigeria to catch up.

Nigeria can improve her economic performance and catch up with South Korea by making transformational efforts to become an innovation-driven economy that is, putting innovation at the core of its development drive. This target will instigate the need to improve the level and quality of human capital and institutions. An innovation-driven economy thrives on the creativity, ingenuity and innovativeness of people; hence, there is a strong motivation to invest in human capital development and improve institutional quality which may be lacking in an economy driven primarily by revenue from natural resources.

While basic education is free in public schools in Nigeria, there is need to pay attention to the quality of education at that level, given that the majority will attend public schools. Moreover, given that the rate of school enrollment is low at the secondary and tertiary levels when compared to primary school enrollment rate, there is need to make secondary and tertiary schools more accessible, affordable and attractive. With respect to accessibility, there are entry and admission exercises and examinations designed to screen out the best students while the majority are marginalized without a plan for them. For instance, about 70% of respondents in a forum have written JAMB (Joint Admission Matriculation Board) examination at least twice. This is an indication of delay and impeded access to education at the tertiary level. New models of education, such as mobile learning, MOOCs (massively open online courses), etc. can therefore be leveraged on to address the challenges of accessibility and affordability.

Another vital lesson Nigeria needs to learn from South Korea is the cultivation of strong institutions. This is crucial for developing qualitative human capital and improving the level of innovation. An inverse relationship between government's investment in human capital and economic growth in Nigeria was observed in literature (Maku, 2009; Oluwatobi and Ogunrinola, 2011). This is an indication of misappropriation of public funds specified in the budget, poor curricula and human capital flight. Institutional development is therefore a priority for Nigeria to address gaps such as these. Hence, there is need for Nigeria to cultivate strong institutions that abhor corruption, review curricula to suite the economy's needs per time and restrict human capital flight by providing incentives and attractive opportunities to highly skilled human capital.

Good institutions are also necessary to protect intellectual property rights. This will serve as an incentive for innovators to keep innovating. Where there is little or no incentive for generating creative ideas and inventions and such are not protected from big capitalists, inventors are likely to lose their ideas and benefits to big capitalists. This can discourage creativity and innovation. Protection of intellectual property rights should therefore be given priority. In addition to this, the law must be accepted and perceived as supreme and must not be bent to gratify the interests of some group. This will provide an enabling environment for business, economic activities and competition.

CONCLUSION

South Korea represents part of the testimonial of the East Asian economic miracle. It also attests to the fact that economic miracles are outcomes that are initiated. After observing the difference in economic performances between Nigeria and South Korea, it is apparent that the level of human capital, the quality of institutions and the level of innovation are factors responsible for the variances between both countries. While, South Korea created an enabling institutional environment for human capital development and the development of an innovation-driven economy, the Nigerian economy is yet to be founded on strong institutions that enable economic freedom. Nigeria can therefore learn from South Korea by setting up institutional frameworks that support free enterprise, discourage corruption, reward expressions of human ingenuity and protect intellectual property rights. Such foundation will provide opportunities for innovation to be placed at the centre of the development process and, thus, grant good motivation to invest in human capital development.

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