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**ON**

**ENGINEERING LAW AND MANAGERIAL ECONOMICS FOR INFRASTRUCTURAL DEVELOPMENT IN NIGERIA;**

**CHALLENGES AND WAY FORWARD**

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 ABSTRACT

This study is set out to investigate the impact of fiscal policy variables (capital expenditure, recurrent expenditure and direct income tax) on economic growth in Nigeria. The study adopts a growth accounting framework that specifies economic growth as a function of the fiscal policy variables. Using a time series data for the period 1970-2012, the study tests for the presence of unit root test, using the augmented Dickey-Fuller test for stationarity. It is discovered that all the variables are integrated at I (1). The Johansen cointegration reveals the presence of a long run relationship between economic growth and all the dependent variables (CX, RX and TX). The VECM analysis indicates that capital expenditure and recurrent expenditure are positively related and statistically significant in determining economic growth in the long run. As expected, direct income tax is inversely related and statistically significant in determining economic growth in the long run. A 1% increase in capital expenditure leads to an increase of 3.94% in income. A 1% increase in recurrent expenditure leads to an increase of 3.22% in income. On the other hand, a 1% increase in direct income tax leads to a fall of 6.83% in national output. Moreover, only tax determines economic growth in the short run, as a 1% in direct income tax causes national output to fall by 0.39%. These results meet apriori expectations with respect to their signs. GDP adjusts to its long run equilibrium when there is a shock at a slow speed of 3.07%. The pairwise granger causality indicates that causality relationship does not exist between any of the fiscal policy variables and economic growth. Based on these results, the study recommends the adoption of tax policies that would spur growth instead of retarding growth with a wide margin, as has been observed from the study. Efforts should be made to skew the pattern of public spending towards capital expenditure as it leads to higher growth than recurrent expenditure.

SUMMARY

Infrastructure development is the basis of measuring the performance of democratic leaders and it is the foundation of good democratic governance. Infrastructure is the medium, the tools and techniques of a project or programme or strategy. Demand for infrastructural development is higher

and resources used in provision of infrastructure are limited. Ethnic-interest agitation and lobbying

are common things in democratic governance. The military era in Nigeria was for the most part of the economic boom and only succeeded in widening the gap in infrastructure demand and provision. Most infrastructures are now decayed and need repair or replacement. Government is the system that organizes and sensitizes the people of an area in other for all to have an acceptable community.

Government have the power to put in place all measures that it deems fit will make an environment conducive for living for everybody. Infrastructure development in democratic governance involves identifying the right project, carrying out feasibility and viability studies and carrying out physical development of the project. The challenges are numerous and include finance, technology for development, maintenance and design. The challenges also include international requirements of project to be sustainably developed.

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 INFRASTRUCTURAL DEVELOPMENT, REAL ESTATE AGENCY RE BRANDING AND REVIEW OF NATIONAL HOUSING POLICY: THE ROAD MAP FOR RAPID ECONOMIC DEVELOPMENT FORUM

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INTRODUCTION

 As engineers we perform different services to create work, investigation, planning, analysis, design engineering works and systems, planning to use the land and water constructing different engineering surveys and the review of constructions or design products for the purpose of monitoring compliance with design drawing.

The population of about 173 million people, Nigeria is the largest country in Africa and accounts for 47% of West Africa’s population. Given these large reserves of human and natural resources, the country has significant potential to build a prosperous economy characterized by rapid economic growth through real estate rebranding leading to infrastructural development that can significantly reduce poverty, inequality and improve standards of living of the population through better access to and quality of health care, education and infrastructure services (Falade, 2007).

One of the organization that has been promoting real estate agency rebranding in Nigeria is The Real Estate Developer’s Association of Nigeria (REDAN) which is the principal agency of the organized private sector recognized by government and approved by the Federal Mortgage Bank of Nigeria (FMBN) the apex mortgage lender in Nigeria to facilitate the delivery of affordable mass housing in Nigerians (REDAN, 2015).

Housing policy in Nigerian is as old as the history of the country. Thus, we can broadly categorize its historical development under the five distinct phases of the colonial period (before 1960), the post- independence period (1960-1979), the second civilian administration (1979-1983), the military era (1984-1999), and the post military era (1999 to date). The major characteristic of the colonial period was the provision of staff quarters for expatriates and other indigenous staff of parastatals and organizations. This era witnessed the creation of Urban Councils in 1946, the establishment of Lagos Executive Board (LEBD) in 1954, the formation of Nigerian Building Society in 1955, as well as the enactment of Regional Housing Corporation in 1959. Also, the post-independence period experienced some improvements in housing provision during the First National Development Plan period (1962-1968) and the second National Development Plan 1970-1974). Specifically, the formulation of the National Council on Housing in 1971 led to further improvement in housing delivery. The third National Development Plan (1975-1980) made further improvements on housing programmes, policies and The transformation of the Nigerian Building Society into Federal Mortgage Bank of Nigeria with the promulgation of Decree No 7 of 1977 also brought some improvements into housing delivery in Nigeria. The Land Use Decree (LUD) of 1978 was promulgated in order to guarantee access to land by all Nigerians. Before the promulgation of the LUD, dual land tenure structure was paramount in the country. The LUD came to stabilize the ownership and acquisition of land. Also, during the era, the constitution of the Federal Republic of Nigeria (1979) laid emphasis on the importance of local building materials and the relevance of labour and construction industry. In this same year

Africa’s most populous nation has enjoyed a bumper year so far in 2014, most notably with the announcement in April that it surpassed South Africa as the continent’s largest economy. However, this is not to say that path-breaking changes haven’t been gaining pace now for years, as the country has succeeded in distancing itself from the reputational problems that best characterised its past.

Now that Nigeria has come to rank among the world’s leading economic superpowers, policymakers along with major corporate names must now take pains to focus on a long-term strategy, in order for the country’s successes to continue far into the future.

Critical to Nigeria’s economic development is the engineering sector, which has long stood as a major driver of growth and an essential solution in addressing the country’s infrastructural deficiencies. The aim for Nigerian policymakers, as is the case with many other emerging markets, is to capitalise on the opportunities that have come as a result of rapid economic growth and focus first on improving the building blocks on which long-term prosperity depends.

***How has Nigeria’s engineering sector contributed to the country’s growth in recent years?***
Nigeria is now recognised as the largest economy in Africa due to the growth in GDP seen in recent years, and, according to the Nigeria Bureau of Statistics, national GDP stands at NGN80.22trn. Given that the engineering sector underpins a lot of other sectors, such as construction, power, agriculture, telecommunications and so on, it plays a prominent role in its contribution to GDP.

This success is due principally to the sector’s expertise, which generally amounts to enough talent and capacity to cope with any project that might come its way. This expertise can best be seen in the construction and telecommunications industries, which are booming sectors in the country. What’s more, the spectrum of the ongoing engineering activities and the growth in GDP has enhanced the development and training of young engineers, as well as the creation of job opportunities.

***How has it grown in recent years?***
There has been tremendous growth in recent years, with some of the more notable opportunities opening up in the power and communications industry over the course of the last 10 years. The telecommunications industry has over 125 million subscribers, most of whom access data via their mobile phones, a trend that has also paved the way for e-commerce in the country, with the likes of Jumia and Konga leading the way.

The power sector has also undergone a series of dramatic changes, owing to the privatisation of public sector infrastructure and the opening up of the power market to private sector participants. The construction sector, particularly in Port Harcourt, Abuja and Lagos, has also seen innovative projects like the Eko Atlantic City enter into the development phase.

The sector has grown in terms of innovation and created millions of jobs, while at the same time giving rise to the implementation and enforcement of relevant policies and laws.

***In what ways is Stag leading the way in Nigerian engineering?***
Well, Stag is stimulating the Nigerian engineering sector through the evaluation and implementation of best practices and through collaboration with other professional organisations and individuals in the industry. Stag is keeping abreast of the trends in the sector and is currently positioning itself at the centre of the power sector in the country by providing clean and uninterruptible power to its inhabitants.

The company is achieving this through the provision of power captive power generation solutions, the maintenance of high and medium voltage infrastructure, construction of power stations up to 30MW, and by becoming a vendor for metering and other equipment for the distribution and transmission sectors of the industry.

***Tell us about some of Stag’s biggest achievements over the last few years***
Stag specialises in the provision of power generation equipment in the range of 10-5,000kW using both basic and synchronising systems. The company has supplied and installed power stations and supplied solutions for government institutions, hospitals, Evans Plc, Sheraton Abuja and Shoprite in only the last few years. It is also involved in rural electrification and power supply to communities and is currently in the process of expanding its range in order to become an independent power producer.

***What are Stag’s key products?***
Stag specialises in power and marine engineering support services and supply, and represents a number of major industry names such as MTU, Rolls Royce, SDMO and Kohler products and services in Nigeria. We also represent reputable organisations in Europe and America, such as John Deere Power, Stanayne, and a number of others. Other services include engineering support services such as design, feasibility studies, and the construction of power station and distribution infrastructure and equipment such as transformers, RMUs, outdoor breakers, load break switches, compact sub-stations, outdoor metering units, smart meters, and other high tension equipment.

***In which areas has Stag seen the greatest opportunities?***
The main opportunities in the Nigerian and African regions are in the provision of power engineering, most especially in the construction of embedded power stations and power distribution systems. The main policy and ambition of every African government is the development of sustainable power solutions to enable economic growth.

The Nigerian Local Content Act also presents opportunities in the oil and gas engineering sectors, which has long been dominated by foreign enterprise. The development of the offshore patrol vehicles of all the navies of the continent also brings about more opportunities in the marine engineering sector.

***How important is corporate social responsibility to your business?***
Corporate social responsibility (CSR) is very important to Stag. As engineering is core to our business, the company’s CSR is focused on the training and development of prospective engineers for various sectors. Aside from providing training to employed engineers, the company also sponsors young students enrolled in engineering colleges throughout the county.

***How do you see the industry developing over the coming years?***
I believe there will continue to be inflows of foreign direct investment for the construction, power, telecommunication, oil and gas and agricultural sectors. I also think we will see a lot more innovation in products and services in these same sectors. With these two ingredients, I believe the Nigerian engineering sector will play an even greater part in the country’s GDP and, more indirectly, the standard of living among its people.

***What are Stag’s future plans?***
The company can only move and develop by expanding upon its existing talents. Stag fully intends to continue to train and develop its engineers to the utmost international standards in the field of power generation, power distribution and marine engineering.

INFRASTRUCTURE CHALLENGES

The fundamental contrast between the human settlements in Cape Town, South Africa, Bel Air, California and Mushin in Lagos, Nigeria is the state of the environment and infrastructure. Likewise, the difference between being in Bar Beach Lagos, Nigeria and Sea Point, Cape Town, South Africa. Scaling up the analogy, the difference between Nigeria and the United Arab Emirates or Lagos State and Singapore lies essentially in the environment and the state of the infrastructure. Evidently, habitat and humanity (human settlements) are defined by the people, their land and means of livelihood as directly portrayed through the lenses of their infrastructure condition. Therefore, human settlements exemplified by cities provide the quintessential context for infrastructure.

Clearly, infrastructure is a ``big deal" because it provides services that are part of the consumption bundle of residents as well as serve as inputs into private-sector production. Therefore, it is all things good to all people. As an intermediate input into private-sector business activities, it boosts the contribution of capital and labor to the normal production of goods and services in the economy. Hence, it is also a major part of the backbone of national economies and people’s livelihood (income and employment). Infrastructure includes highways and roads, highway safety and standards as well as enforcement measures; mass transit and airport facilities, electricity, gas and water supply systems, waste water treatment facilities, solid waste management, storm water drainage and sewerage disposal systems, correctional institutions, education facilities, public health delivery systems, health and safety and emergency response systems (law and order and fire services).

Some infrastructure types are available for all to consume without the use by one person adversely affecting the ability of another to access and enjoy the same services. In other cases, it may be very costly to exclude others from accessing and enjoying the services once it is on-stream or has been rolled out. When services are subject to free-riding, economists refer to this feature as non-exclusionary. According to the cognoscenti, these infrastructure types exhibit features of public goods. Pure public goods are non-rivalry and non-exclusionary. Infrastructure bundles that fall outside this class are either private or club goods depending on how the ownership and control rights are assigned. Power, roads and water are examples of what can be either a private or club goods depending on the allocation of property rights and control rights.

The possibility of free-riding and the incentives it creates explains the concern over appropriability as an underlying driver in infrastructure typology. To be precise, one method of classifying infrastructure is according to access rights, property rights, and control rights exercisable over them. Another useful way of looking at infrastructure types is according to what they do; a functional approach. Using this approach, roads network including highways, water, electricity and telecommunications infrastructure services that enter as intermediate inputs into private-sector output are classified as core infrastructure. While serving as intermediate inputs into private-sector economic activities, some of these core infrastructure types also count as final goods because flow of services from such types are consumed directly by residents. I have labeled these infrastructure components which form part of social infrastructure as basic infrastructure. The term basic infrastructure is chosen to capture the reality that “individuals living in squatter camps and slums which lack social infrastructure such as water and sewerage systems and electricity can be classified as poor cohorts regardless of movements in their indicators of income and food consumption.1" This is why as a basic consumption good, infrastructure is also a central issue in poverty alleviation strategies and in class conflict and struggles. On this basis, I contend that absolute social welfare deprivation as well as relative social welfare deprivation can both be measured and benchmarked by group rankings in terms of infrastructure services, linking such measures all the way to Maslow’s hierarchy of needs.

Basic infrastructure bundles are formally referred to as public capital. It is called public capital because the services they provide are de facto public goods. As public goods, it is practically difficult to exclude others who have not contributed to the deployment or maintenance of such infrastructure from enjoying the services. For this reason, and understandably so, the private sector is not particularly enthusiastic about supplying this segment of the infrastructure demand. Consequently, the niche remains underserved.

The public-goods label carries also an undertone that government should step in and provide the services. In many countries around the world, government dutifully fulfills this responsibility and where it does not completely fill the gap, it seeks to engage with the private sector in a working partnership to deliver such services. All this sounds simple. In other words, the logic is straightforward and in practical terms, easy to appreciate. So, why then are there large deficiencies in basic infrastructure throughout Africa? Even more troubling are the huge gaps between installed and operable capacities in the existing infrastructure stock? Why are there such

 1 Ayogu (2007) major slacks in the maintenance regime which more likely has led to underutilization of available resources when governments should instead be exploring all avenues to close the service deficit? A complete response to these interrogatories requires an audacious research agenda which is outside the scope of the annual lecture intended here.

 Infrastructure Development and Growth in Nigeria Residents of Nigeria and visitors alike experience the unsatisfactory state of infrastructure services in Nigeria, perhaps more of poor quality of service delivery than in the relative cost of delivered services. Furthermore, discussions about service deficit or ``gaps in infrastructure" are very loud without necessarily being clear as to whether the gaps represent deficiencies in service delivery (i.e. variances between promised and delivered quanta and/or quality); gaps between installed capacity and operable capacity, or suboptimal investment in capacities. Any of these deficiencies can be usefully labelled a gap. Therefore, the discussions could be improved by injecting more specificity into the analysis.

It does not help matters that infrastructure analytics are inherently complex because some of the outputs are often delivered from components that come as a bundle. Water, electricity, roads, highways, educational buildings, health facilities, telecommunications, parks and recreational facilities come to mind easily. The density and configuration of feeder roads as well as highway networks matter in determining the quality of roads infrastructure. That quality is also codetermined by the adequacy of its complements such as congestion pricing, enforcement and traffic engineering. Bulk water supply cannot be properly anticipated without planning for energy to power the pumping stations. Similarly, planning for roads network may not be realistic without a thorough consideration of land use as well as the nature of feeder roads and highways that comprise the envisaged roads network configuration. The inherent nature of complementarities involved in infrastructure as well as the systemic way they must function in order to deliver reliable flow of services makes coordination crucial and holistic planning inevitable. Integration is along two dimensions namely, jurisdictions and infrastructure types. These generalized externalities from infrastructure development cause scholars to argue that infrastructure both leads and lags economic growth and employment; i.e. it drives growth and is in turn driven by growth.

 Unfortunately, infrastructure development in Nigeria remains ad hoc and highly reactive, muddling along chiefly in response to emerging challenges from the daunting task of restructuring public enterprises. The legacy of not having an infrastructure master plan or of not launching an integrated infrastructure development strategy is poor public policy space on infrastructure. The cost of this legacy is the many daunting challenges in attempting to drive infrastructure growth. For instance, the pervasive binding resource and incentive constraints in the infrastructure space have muddled public policy and slowed private choices on infrastructure investment. I will briefly discuss these issues using the electricity sector as a case study. Similar parallels can be drawn with water, oil and gas, highways, roads and bridges, airports and harbors as well as correctional facilities. But I focus on electricity for two simple but solid reasons. First, the sector is strategic.2 Second, no one can deny the abysmal power situation in Nigeria. For Nigerians, the classic song, ``Original Sufferhead" by the late musical icon, Fela Anikulapo Kuti tells it all. Alternatively, a casual stroll through any highbrow neighborhood in Nigeria at night can yield an unforgettable experience of the power situation. My view is that in taking the walk, one will either become temporarily deaf or blind. Deaf from the overwhelming cacophony from the pervasive power generators belching out their smoke and noise in a seemingly weird competition to pollute. On the other hand, one may be treated to an utter tranquility but pitch darkness from a blackout. So, the choice is over being deaf or blind, temporarily.

Let me preface my discussion of the evolution of the electricity sector with a few remarks about the development and growth of infrastructure in Nigeria. Ideally, the timeline from 1999 when civilian administration returned to Nigeria should have provided twenty years of data to assess the growth and development of infrastructure in Nigeria. But such a useful exercise for design and execution of plans requires an understanding of the appropriate metrics and availability of data. As far as I know, there is currently no publicly available systematic mechanism for collecting data on the quality of service delivery in Nigeria.

The Public to Private-Sector Infrastructure Invitational To conclude this discussion, I would like to encourage investors to take a fresh look at the socio-political environments in Nigeria or indeed in the subregion to find new roles for the private sector in the public space. Just as the fundamental shift that occurred in America’s legal principles underpinning economic exchanges excised the elements of uncertainties in commercial transactions thus boosting economic activities, so have underperformance of governments and agencies in the sphere of basic infrastructure unwittingly caused a shift in people’s expectations about the provenance of basic infrastructure. Whereas these infrastructure components remain basic and characteristically public capital, my argument is that (weary) citizens nowadays are much more disposed to paying for the flow services from basic infrastructure where and when they can find them (if they find them) regardless of whose primary duty it is to deliver these services. How did this attitude shift occur?

Although personally I do not consider it good fortune, governments in many African countries have successfully shirked their responsibility to provide basic infrastructure and morphed that duty into a shared burden with the society. Consequently, they have unwittingly succeeded in moving the locus of expectation for those services out of the public domain. Folks have simply given up on governments whereas governments for reasons given earlier—politics of divisibility—are able to get away with oppressing the majority. This shortcoming in governance and the resultant despondency, having set the tone for private sector provision have also created the opportunity for a dialogue between all the relevant actors in the societal sphere.

An infrastructure hard talk by means of stakeholder forum to consider their respective potential roles in the public-private provision of basic infrastructure. Although the actors comprise the corporate, civil society and governmental spheres, the focus should be on a sub class of actors who are of special importance for our purpose, the non-state actors. These comprise intergovernmental actors such as the World Bank, Multilateral Investment Guarantee Agency and the United Nations; business actors, nongovernmental actors, and not-for-profit organizations. These are the subclass most expected to take up the challenge of augmenting the deficiency in the provision of basic infrastructure and to which this invitational and pitch is directed. While not directed at governments, they are nonetheless implicated because successfully exploiting this window of opportunity on infrastructure provision depends critically on getting right the governance arrangements. Transaction costs lie at the heart of such governance arrangements. Therefore, how governance is perceived to function will make or break the outcome of the invitational. The way government has acted in the electricity sector does not augur well for shared participation in the infrastructure sphere although there is probably enough blame to go around as should be the case in a regime of crony capitalism.

Let me end on a club note by asking what can be done to close the infrastructure deficit when all infrastructure types seemingly become club goods? I would presume first to ring-fence the precinct, provide the services and recover service costs by way of user fees. That’s what clubs do. But clubs also do not take undue advantage of their members. On the latter, strong oversight (governance) will prove indispensable because ``men are no angels." Clearly the requirements for good governance are never far away and as Newberry argued, network utilities who are the commonest provider of basic infrastructure operate under the terms set by the state. It seems that the state is ubiquitous in all human endeavors which fact by now should be obvious to most social observers. As noted in the opening section of this lecture, the old debates between the virtues of state and markets are sterile. In truth, society always needs both.

THE CHALLENGE AND CONCLUSION

 The challenges are in establishing political accountability and political order. How do we enable the state to rule us and yet restrain it from the excesses of power by enabling the state to constrain itself? Economics began with Xenophon’s ``economicus" (c 360 BCE), in which Socrates interviews a model citizen who has two primary concerns. He goes out to his farm in the country to monitor and motivate his workers there. Then he goes back to the city, where his participation in various political institutions is essential for maintaining his rights to own this farm. Such concerns about agents' incentives and political institutions are also central in economic theory today. But they were not always (Myerson, 2007).

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