

## INFRASTRUCTURE AND SUSTAINABLE ECONOMIC DIVERSIFICATION IN NIGERIA

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### ABSTRACT

Following the perceived overdependence of the Nigerian economy on oil since oil was discovered in commercial quantities and the accompanied economic ills, the paper investigated the impact of adequate infrastructure on economic diversification in Nigeria using qualitative research techniques to examine secondary data obtained from the National Bureau of Statistics, African Development Bank, CIA Fact Book and African Economic Outlook on revenue composition, infrastructural index, diversification index and real GDP growth rate in Nigeria and other selected West African countries for effective comparism. It was descriptively established that adequate infrastructural development has been a veritable alternative for achieving sustainable economic diversification and hence economic growth and development in Ghana and Cote d Ivoire relative to Nigeria. On that premise, policy makers and government of Nigeria were urged to give priority attention to investment in critical infrastructural development such as roads, electricity, health and water as a way of diversifying her economic base to reduce the current over-dependency on oil revenue for all her economic activities.

**Keywords:** Infrastructure, Economic Diversification, Nigeria, Descriptive Statistics, Nigeria

**JEL Classification:** L97, L98 & L99

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### 1.1. INTRODUCTION

More often, economists and development experts argued that the relative socio-political and economic stability of an economy is purely hinged on the extent to which there is diversification of the essential economic resources such as production, employment and income. Jooji, Okwara & Oguchi (2017) are recently of the opinion that any economy that derives its sustenance from one or few industries is certainly more vulnerable to fluctuations and shocks from the vicissitudes of cyclical behaviour than those with a wide variety of sources

of income. Nigeria got her independence in 1960. Since then, the country has derived on comparative terms very high revenues for development. The revenue came initially from the sale of agricultural produce and later from the sale of crude oil. However, this revenue has never translated into sustainable improvement in the welfare of the people as insecurity, unemployment, inadequate infrastructure, poverty, hunger and disease infestations remain major issues threatening the corporate existence of the country. This point is well supported by the views of Salisu & Mohd (2015) when they argued that part of the insecurity challenges confronting Nigeria, like the Boko Haram and insurgency are traceable to extreme poverty in the country.

It thus implies that Nigeria has not demonstrated enough economic capacity and the political will to effectively manage two or more key economic sectors at a particular time. The scenario demonstrated so far shows that when one economic sector grows into prominence in Nigeria, the other(s) goes into complete obscurity. This explains why agriculture, a mono-product economy that was the mainstay of the Nigerian economy since 1960 was substituted by oil, another mono-product economy in the early 1980s. Since then, it is either there is oil revenue or there is no Nigeria. Attempt by economists and policy experts to thwart the continued dominance and dependency on oil sector and diversify the productive base of the Nigerian economy through appropriate policy prescription led to the adoption and implementation of several economic policies in Nigeria.

One of the major policies introduced in the country in 1986 was the Structural Adjustment Programme (SAP), an inward looking economic strategy with the target of diversifying the productive capacity of the Nigerian economy for massive exportation. SAP came up with rapid and extensive liberalization, deregulation and privatization of economic activities in search of a solution to the economic stagnation and decline (UNCTAD: World Trade Report, 2016). It is however unfortunate that oil sector still dominates economic activities in Nigeria accounting for more than 80% of export earnings and government budgetary provision (Central Bank of Nigeria (CBN), 2010).

In theory, Nigeria is widely known as Africa's most populous nation and its biggest economy, however in practice, Africa's biggest economy still faces major economic challenges of which infrastructure tops the list. From bad roads and rail, to poor irrigation systems and water pipelines, to poor mobile and broadband networks, and housing and energy, the current epileptic power supply is desperately inadequate and in need of a revamp. The current

infrastructural provision does not meet the need of Nigeria's fast growing population and economy hence this has put a huge strain on the country's already existing infrastructure particularly in fast growing urban areas like Lagos and Abuja. In many parts of the Nigeria, infrastructural facilities and services which would have form the catalyst for production and other related economic growth and development activities are poorly developed if not completely lacking. Majority of the rural populace are trapped and sub-merged in a sub-human culture of silence, misery and isolation. In the words of Edun (2011), many parts of rural Nigeria are characterized by unreliable access feeder roads, no light or epileptic power supply, no major educational institution, no recreational facilities among others and worst still is the fact that these vulnerable people have nowhere to run to.

Infrastructure plays a very significant role in the economic growth and performance of countries in recent times. There is a popular saying that, where development of infrastructure has followed a rational, well-coordinated and harmonized path, economic growth and development receives a big boost. Korea and Japan belongs to this group. Where the growth of infrastructures has not followed such a rational and coordinated path, economic growth and development is stunted. Example here includes most African countries and other developing economies of the world. The provision of adequate infrastructural facilities can expand the productive capacity of the economy. That is, by increasing the quality and quantity of economic infrastructure, the transformation curve or the production possibility curve (PPC) of the economy would shift outwards in response to the expansion of the economic infrastructural base, thereby accelerating the rate of economic growth and enhancing the pace of socio-economic development.

It is in line with this modern thinking about the benefits of infrastructural development and most pertinently the causal links of such development to economic diversification that this paper investigated empirically the extent to which development of economic infrastructure has enhanced economic diversification in Nigeria. As modernity, the paper is of great significance to policy experts and economists, and particularly the government of the Federal Republic of Nigeria who appeared not to assimilate well the consequences of overdependence on oil economy and as such, has persistently neglected the yearnings for true economic diversification.

Though the scope of the paper is limited to Nigeria, the statistical data analysis covered Ghana and Cote d'Ivoire, the biggest economies in West Africa

and Africa (IMF, 2017). The three West African economies control an aggregate share of over 60% of the region's estimated 238 million populations. Nigeria ranked first in West Africa (and indeed, Africa) with approximately 187 million people which is about 50% of the regional population, followed by Ghana with approximately 28 million population (7.9%) and Cote d' Ivoire with approximately 23 million (6.6%), according to United Nations Population Division estimated data for year 2016. The three countries control over 80% of the 2016 estimated total West Africa regional GDP of approximately USD695.848 billion (IMF: World Economic Outlook, 2017).

## **2.1. WHAT IS INFRASTRUCTURE?**

Infrastructure is an umbrella term for many activities and basic structures and facilities necessary for a country to function efficiently. CBN (2010) says it is the basic essential services that are required to enable development to occur. Jooji, Okwara & Oguchi (2017) defined infrastructure as the basic physical and organizational structures needed for the operation of a society like industries, buildings, roads, bridges, health services and good governance. Fulmer (2009) views infrastructure as the physical components of interrelated systems providing commodities and services essential to enable, sustain, or enhance societal living conditions. A definition by Sullivan & Sheffrin (2003) says it is the enterprise or the products, services and facilities necessary for an economy to function. Hirshman (1958) sums up the view on infrastructure by defining it as social overhead capital.

Thus, infrastructural development refers to the deliberate creation and empowerment as well as improvement of basic structures necessary to boost production of goods and services in an economy. Infrastructure development include the development of the entire system of physical, human and institutional form of capital which enables rural residents to better perform their production, processing and distribution activities as well as help to improve the overall quality of life. Socio-economic development can be facilitated and accelerated by the presence of social and economic infrastructures. In a related development, all community and social services and facilities provided by government or privately provided including roads, water, sewer, emergency services, parks, recreational facilities, research centres, shops, libraries and public transport are also referred to as infrastructure. These are all essential services needed for the smooth functioning of the community, such as transportation and communications systems, water and power lines, and public institutions

including schools, post offices, prisons, roads, drains, electricity, water, gas and telecommunications.

Generally, infrastructure according to CBN (2010) can be classified under the two major classes:

- (i) Social Infrastructure - education, health, recreation and housing: This is required to boost the quality of daily living with a ripple effect on the country's economy based on human capital. The improvement of human capital in this regard will ensure innovation, invention and enhancement of productivity in the economy. The quality of social infrastructure affects urbanization which is directly proportional to GDP.
- (ii) Physical/Economic Infrastructure - roads, electricity and telecommunication: These are public utilities that enable effective economic activities that grow GDP and per capita income. Where physical and economic infrastructure is adequate, economic growth and development receives a big boost. It is on this premise that the Nigerian government needs no options but to build a robust economic infrastructural system to facilitate economic development.

## **2.2. WHAT IS ECONOMIC DIVERSIFICATION?**

Economic diversification refers to an ideology empanelled by economic experts to promote a growing range of economic outputs in an economy. Alternatively, it can be referred to as the expansion of markets for exports of economic resources away from domestic economic activities. Traditionally, economic diversification has been used as a strategy to transform the economy from using a single source to multiple sources of income spread over primary, secondary and tertiary sectors, involving a large segment of the population. The objective according to Nourse (1968) has been to improve economic performance for achieving sustainable growth, for instance, building resilience against fluctuations in extra-regional economic activity, reducing vulnerability to income loss due to volatility of product price in the international market like Organization of Petroleum Exporting Countries (OPEC), creating job opportunities and alleviating poverty.

Chenery (1979) and Syrquin (1989) reported structural models of economic development which hold that countries should diversify from primary exports into manufactured exports in order to achieve sustainable growth and development. The view above indicates that economic diversification is any

strategy adopted by a nation to reduce the vulnerability of its economy to shocks detrimental to it by spreading and increasing productivity from primary to secondary and even tertiary products. Diversification does not occur in a vacuum. There needs to be an enabling environment to make diversification possible. A number of key drivers have already been identified, the 2007 UNECA Economic Report on Africa identified: investment, trade and industrial policies; a dynamic growth performance; macroeconomic stability, a competitive exchange rate and expansionary but responsible fiscal policy; and institutional variables such as good governance and absence of conflict.

### **2.3. DOES INFRASTRUCTURE AND SUSTAINABLE ECONOMIC DIVERSIFICATION RELATE?**

In Nigeria, Ekundare (1971) has argued that most of the infrastructural facilities in the Nigeria were developed during the second national development plan between 1970 and 1974. It is therefore not surprising that the main emphasis of the second national plan was on social change, to lay the foundation for the development of public infrastructure for productive, and consumption purposes due to the oil-boom accruals to the country. Similarly, successive government's involvement in the provision of infrastructure was also for social, economic and financial reasons. It was expected that infrastructural development would create varieties of economic activities for the people hence economic diversification would be easily achievable. In the same vein, economic diversification was expected to help tackle a number of economic issues such as hunger, poverty, disease and shelter (Jooji, Okwara & Oguchi, 2017).

Economic infrastructure would have reduced the over-dependence on income from few primary commodities especially minerals since they are price-volatile and exporting them, may transmit volatility into public finance and national income. However, due to the high volatility of the oil market and poor implementation of the national plans and successive federal and states budgets in Nigeria, the neglect of all infrastructures in the country and under-investment has been noticed (Edun, 2011). This neglect and under-investment has a lot of effect on the economy by increasing the cost of many raw materials imported thereby reducing productivity and competitiveness of firms in the country. It has also affected poor road networks, poor power supply, poor aviation networks, poor railway services, and abandoned building projects all over the country in education, health, housing and transport infrastructure (Edun, Akinde, Olaleye & Idowu, 2013).

Similarly, under-investment in infrastructure as reported by the CBN (2010) has also affected the inflow of FDI into the country, as most investors have flooded to countries where there are abundant infrastructural facilities, and due to lack of infrastructure, many firms relocated out of the country. Despite this however, the country has recorded growth in her economy but not translated to economic development. At the state and local government level, infrastructural development is still low. A report from the National Bureau of Statistics (NBS) (2016) shows some relative growth in state infrastructure in states like Anambra to have improved to 35.1% out of total improvement (renovations) in dilapidated structures and other social infrastructure. Benue State got 38.2% out of the total worth in social infrastructure development, Rivers state 26.7%, Lagos state 25.4%, Bauchi state 21.3% and the host of other states.

#### **2.4. THEORETICAL FRAMEWORK**

**The Classical Theory of Investment:** In economics, investment refers to the production of goods that will be used to produce other goods. Keynes (1936) noted that investment is usually the result of foregoing consumption. The theory of investment dates back to the classical economists like J. B. Say, A. C. Pigou, Alfred Marshall and Lord Maynard Keynes. Jhingan (1997) reported the importance Keynes and Pigou attached to the role of investment in promoting economic growth in his theory of aggregate demand and employment. The five major theories of investment- cash flow theory of investment, accelerator theory of investment, managerial theory of investment, neoclassical theory of investment and modified neoclassical theory (Q-theory) of investment have all recognized the importance of investment to economic growth. The neo-classical and Keynesian economists postulated that in a closed economy, investment can come only from the foregone consumption-savings of private individuals, firms and government.

In an open economy however, investment can surge at the same time a nation's savings is low because a country can borrow the financial resources necessary for investment from neighbouring countries. Barro (1995) noted that this was an important source of investment financing in the United States of America in the early 1950s. This explains why Keynes (1936) treated investment spending as an injection into the circular flow of income. Individuals, firms and the government invest for two primary reasons: firstly, investment may be required to replace worn out or failing machinery, equipment, or buildings.

This is referred to as capital consumption and arises from the continuous depreciation of fixed capital assets. Secondly, investment may be undertaken to purchase new machinery, equipment, or buildings in order to increase productive capacity. This will reduce long term costs, increase competitiveness and raise profits. Gross investment includes both types of investment spending, but net investment only measures new assets rather than replacement assets. This relationship is expressed in the following identity:

$$\text{Net Investment} = \text{gross investment} - \text{depreciation}$$

In economic theory, net investment carries more significance as it provides the basis for economic growth. The level of investment in most economies tend to vary by a greater extent than the other components of aggregate demand due to the fact that the underlying determinants such as business confidence, interest rate, changes in national income, expected return on investment, general expectation, level of savings and corporation tax. In most economies, total net investment is the addition of private net investment, firms' net investment and government net investment and the result is usually expressed as a percentage of the GDP.

This is the view accepted and adopted for this work as investment in infrastructure could come in the form of capital consumption to replace the decaying national infrastructure in Nigeria or in the form of raising new infrastructural facilities like roads, buildings and productive machineries to reduce long term costs, increase competitiveness and raise profits. This theory is adopted for the work as special investment in infrastructure remains the only option left for the Nigerian government to remedy the infrastructural crisis to pave way for diversified productive activities in the economy.

## **2.5. RECENT EMPIRICAL WORKS**

Empirical literature on this emerging subject matter is quite scanty. For instance, Jooji, Okwara & Oguchi (2017) examined poverty reduction through economic diversification and infrastructural development in Nigeria and found a positive links from economic diversification and infrastructural development on poverty reduction in Nigeria and indeed other African economies.

In a related development, Akpan, Udoma & Elijah (2015) investigated the link between private sector development and economic diversification using panel data analysis drawn from selected West African countries over the period 1980 to 2012. The findings showed that economic diversification depends on



the level of private sector development, quality of infrastructure and other non-economic factors such as quality governance and political stability.

Finally, Edun, Akinde, Olaleye & Idowu (2013) wrote on infrastructural development and its effect on economic growth in Nigeria. The model was used to examine the impact of increased labour on production of private goods, public infrastructure, foreign investment, welfare and complete specialization. The result shows positive impact of infrastructure on economic growth in Nigeria. The focus of all these works differs from the on-going work as its only relate to infrastructure and diversification.

### 3.1. METHODOLOGY

The research adopts an elementary methodology to ensure that the key issues involved in the subject matter are vividly elucidated in such a manner that the true causal links between infrastructural developments and economic diversification are understood. This requires secondary data on revenue composition in Nigeria and in the other selected West African countries of Ghana and Cote d'Ivoire for selected years to permit the necessary inference and effective comparism. Data on real GDP growth rate, index of infrastructural development and economic diversification index for selected years is required to further buttress the impact of infrastructure on economic diversification in the selected countries. The data is neatly presented in tables, charts and graphs.

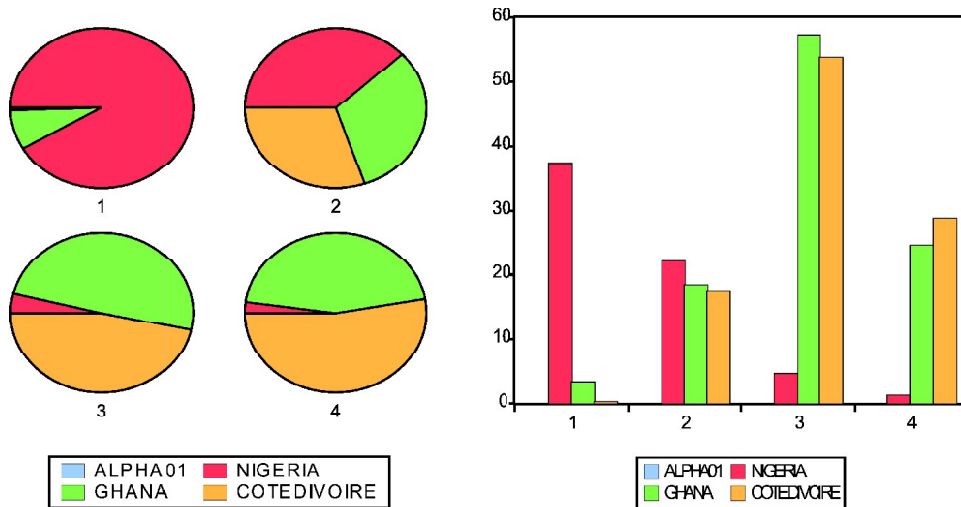
### 4.1. DESCRIPTIVE DATA ANALYSIS

**Table 4.1: Revenue Composition in Nigeria, Ghana and Cote d'Ivoire as at 2018 (%)**

	(1)Oil	(2)Agriculture	(3)Services	(4)Industry
Nigeria	37.33	21.97	4.52	1.20
Ghana	3.2	18.3	57.2	24.5
Cote d'Ivoire	0.2	17.4	53.8	28.8

*Source:* NBS, 2017 and CIA World Fact Book, 2018

Table 4.1 above shows the main sources of revenue in Nigeria as at the end of 2018. To compare the Nigerian situation with other African countries, the same data was obtained from Ghana and Cote d'Ivoire who alongside Nigerian dominates the economy of West Africa. As can be clearly seen from the table, pie chart and component bar chart, oil revenue dominates government



revenue and budgetary expenditure in Nigeria by constituting more than 37% of revenue accruals to the country during the end of 2018. This shows Nigeria's persistent dependency on oil revenue for meaningful economic activities. In Ghana and Cote d'Ivoire, their biggest source of revenue as at the end of 2018 was shown to be services with 57.2% and 53.8% respectively.

Ghana has a more diversified revenue sources than Nigeria as can be seen from the percentage revenue coming from services (57.2%), industry (24.5%) and agriculture (18.3%). Ghana is the world's second largest exporter of cocoa and Africa's second largest producer of gold. Ghana sits on the gold coast, and at one time provided half of the world's gold. Until the recent advent of oil, the country's main export products were cocoa and gold. The composition of outputs has recently shifted from agriculture to services. The services sector recorded the highest growth with critical developments in information and communications technology, health and social works. Of all the industrial activities, water and sewage subsector recorded the highest growth in Ghana with agriculture remaining the mainstay of the people in terms of employment creation and food.

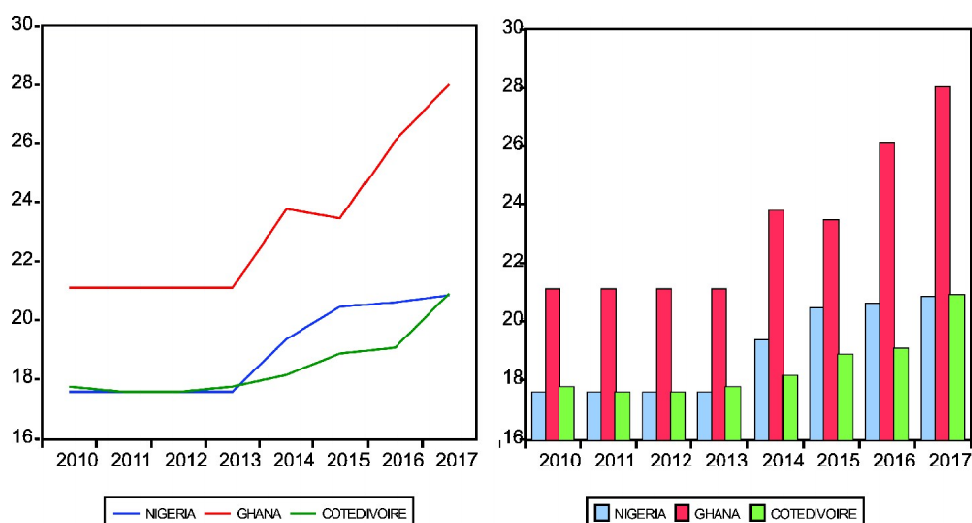
Cote d'Ivoire has also managed a much more diversified economy than Nigeria with impressive growth in services (53.8%), industry (28.8%) and agriculture (17.4%). The fact that the country does not belong to the oil producing states became an incentive for her to promote her existing economic potentials. The growth in telecommunication and agricultural mechanization has been impressive since 2004 after the electoral crises. The relative political stability enjoyed since 2004 has given the country a great impetus to diversify

her productive sectors. This has given the country a bigger capacity to easily absorb revenue shock than a mono-cultural Nigerian economy.

**Table 4.2: Infrastructural Index in Nigeria, Ghana and Cote d'Ivoire (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017
Nigeria	17.58	17.58	17.58	17.58	19.35	20.45	20.60	20.85
Ghana	21.11	21.11	21.11	21.11	23.75	23.43	26.09	28.2
Cote d'Ivoire	17.75	17.58	17.58	17.75	18.13	18.85	19.06	20.9

Source: African Development Bank, 2018

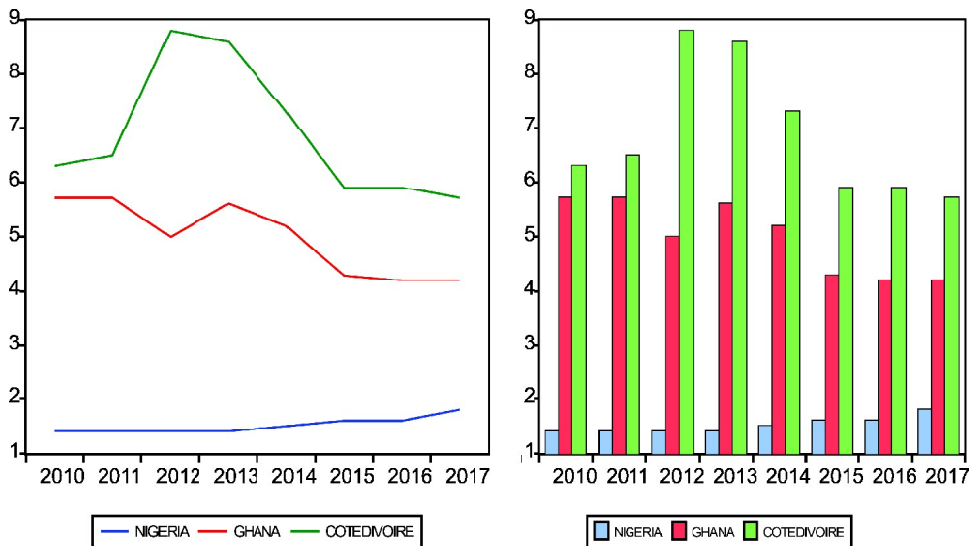


Infrastructural index for Nigeria, Ghana and Cote d'Ivoire is presented in Table 4.2 and further transformed into the charts above. The data came from the African Development Bank and is based on selected indicators that comprise the index's major components, namely: (i) transport; (ii) electricity; (iii) ICT (iv) water and (v) sanitation. The data from 2010 to 2017 and the charts indicate higher infrastructural ranking for Ghana and Cote d' Ivoire against Nigeria except between 2014 and 2016 when Nigeria was ranked higher than Cote d' Ivoire but the country could not sustain the momentum in 2017. The implication of this is simple. That is, if infrastructural development has become a prerequisite for economic diversification, then Nigeria has lagged behind her contemporaries in Africa and may lagged behind in the world. Again, one can envisage the effect this would have on the growth of real GDP and more broadly, economic development of Nigeria.

**Table 4.3: Economic Diversification Index (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017
Nigeria	1.4	1.4	1.4	1.4	1.5	1.6	1.6	1.8
Ghana	5.7	5.7	5.0	5.6	5.2	4.3	4.2	4.2
Cote d'Ivoire	6.3	6.5	8.8	8.6	7.3	5.9	5.9	5.7

Source: African Economic Outlook, 2018



In Table 4.3 and the corresponding charts, economic diversification index for Nigeria is displayed alongside Ghana and Cote d'Ivoire between 2010 and 2017. It can be seen from the table and charts that Cote d'Ivoire and Ghana are all ranked above Nigeria within the period selected. From statistical view point, this result can be interpreted that the volume of investment in basic infrastructural facilities such as roads, education, power, ICT and sanitation in Ghana and Cote d'Ivoire relative to Nigeria has been responsible for the massive diversification of economic activities in those countries. To this end, infrastructural development is an established promoter of economic diversification. There are series of challenges affecting investment in diverse economic activities in Nigeria.

There is a near collapse of the real sector leading to high underperformance of manufacturing activities in Nigeria. This is worsened by erratic power supply, political crises, recent Boko Haram and insurgencies of the north and the prolonged militancy in the Niger Delta region. There is also high cost of

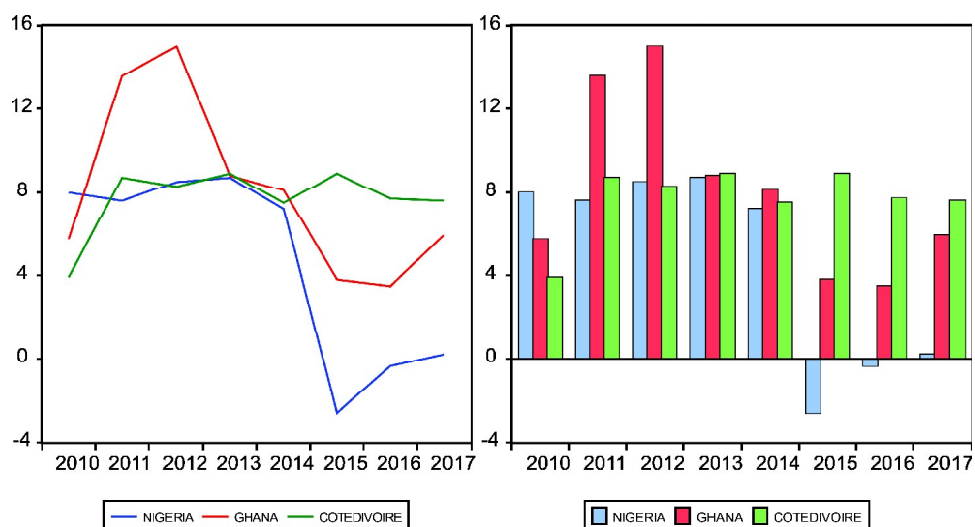
borrowing for investment activities in Nigeria, low propensity to save and high propensity to waste on burials and other ceremonies. The poor performance of the real sector has serious implications for employment generation in Nigeria. In Ghana and Cote d’Ivoire, high manufacturing and agricultural activities there always create room for new investments and employment opportunities.

Table 4.4 alongside the charts below displays real GDP growth rate in Nigeria alongside Ghana and Cote d’Ivoire. The result clearly indicates an impressive real GDP growth rate in Ghana and Cote d’Ivoire ahead of Nigeria between 2011 and 2017.

**Table 4.4: Real GDP Growth Rate in Nigeria, Ghana and Cote d’Ivoire (%)**

Year	2010	2011	2012	2013	2014	2015	2016	2017
Nigeria	7.98	7.6	8.5	8.7	7.2	-2.56	-0.36	0.20
Ghana	5.7	13.6	15	8.8	8.1	3.8	3.5	5.9
Cote d’Ivoire	3.9	8.7	8.3	8.9	7.5	8.9	7.7	7.6

Source: CIA World Fact Book, 2018



GDP growth in Nigeria was better than the selected countries only in 2010. In fact, between 2015 and 2016, the economic recession in Nigeria crippled her growth process resulting into negative GDP growth rate. Economic growth in Nigeria gradually picked up in 2017 and much is expected to sustain the positive momentum. This no doubt requires huge investment in critical infrastructure across Nigeria.

It is evidently clear from the result that economies with higher infrastructural development tend to be more diversified with various alternative economic productive activities and are also more developed through GDP growth rate. This statistical analysis has therefore empirically established infrastructural development as an alternative to economic diversification. It is now easier for the Nigerian government to understand that economic diversification means investment in infrastructure not necessarily agriculture and industries. The present situation of under-investment in infrastructure has a lot of effect on the Nigerian economy and has increases the cost of many raw materials thereby reducing productivity and competitiveness of firms in Nigeria.

### **5.1. CONCLUSION AND POLICY RECOMMENDATIONS**

Result from this descriptive statistical analysis point to the fact that infrastructural development holds an alternative for economic diversification and growth and development. Thus, the Nigerian economy has another opportunity to use adequate infrastructural development to diversify the productive base of the economy. On this premise, the following recommendations are made:

- (i) The Nigerian government must stop paying lip service to the issue of economic diversification. Government must begin to show a good measure of seriousness through massive investment in critical infrastructure across the country.
- (ii) Budgetary provision meant for infrastructural revival should be increased by the federal and state governments. Government should also see to it that the increased financial provision is utilized solely and jealously for the purpose of improving national infrastructure.
- (iii) There is the need for further research into infrastructural financing, either through Public Private Partnership (PPP) or Built Operate and Transfer (BOT), as government alone cannot finance infrastructural development in an emerging market economy like Nigeria that needs to be pragmatic in her infrastructural development, in order to create employment and reduce poverty.
- (iv) There should be immediate mobilization/training of the necessary manpower to go with the infrastructures required to realize the maintenance/sustenance of such infrastructural development.
- (v) The war against Boko Haram and insurgency must not be lost if the Nigerian government is truly committed to infrastructural

development. It is only when there is peace and tranquility in Nigeria that the hinterland can be properly opened up for development.

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