
INFRASTRUCTURE, GOVERNANCE AND INDUSTRIALIZATION IN NIGERIA

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Abstract

This study was conducted with a view to determining the relationship between industrialization, infrastructure and governance in Nigeria and to examine the relationship between infrastructure and governance in Nigeria. A correlational research approach was adopted for the study and data for the study was obtained from MO Ibrahim good governance index report, 2020 and the globaleconomy.com data base for the period 2000-2020. Industrialization was proxied by industry value added, infrastructure was taken collectively as index transport network, access to electricity, internet access and mobile communication. Data was analysed using ordinary least square (OLS) estimation technique in multiple regression form. Findings show that there is no significant relationship between industrialization and governance in Nigeria except for voice and accountability; there is no significant relationship between industrialization and infrastructure in Nigeria except for voice and accountability. The non-significance relations between governance and infrastructure and between governance and industrialization have been attributed to poor performance of governance indices in Nigeria. In view of this, the study recommended among other things that fight against corruption should be taken seriously.

Keywords: Voice and Accountability, Governance Effectiveness, Democratic Governance, Industry

1 Introduction

Infrastructure has been seen by many as a key element in driving development in any nation. The transformation of infrastructure services represents a condition sine qua non for the progressive structural change envisaged by any society (Jaimurzina and Sanchez, 2017). Contextually, infrastructure can be seen as physical and organizational structures and facilities considered crucial in ensuring the security of any nation, its public's health, safety and its

economic growth (Davies, et al, 2019). Categorically, infrastructure can be grouped into hard and soft infrastructure; hard infrastructure is the physical infrastructure of roads, sewers, highways, bridges, electricity, railroads, etc. while soft infrastructure deals with human capital and the establishments that cultivate infrastructure such as universities (Davies, et al, 2019).

The insufficient, inefficient and unsustainable provision of these infrastructure services represents one of the factors behind the structural imbalances that characterize so many regions, such as an undiversified productive structure, lagging efforts and performance in terms of innovation, high concentrations of income and wealth, and vulnerability to climate change.

The ways in which infrastructure availability and functions affect sustainable development are recognized in the 2030 Sustainable Development Agenda, and in particular in Sustainable Development Goal (SDG) 9, referring to the development of high-quality, reliable, sustainable and resilient infrastructure. SDGs 6, 7 and 11, for their part, make explicit reference to infrastructure, highlighting the need to “ensure access to water and sanitation for all”, to “ensure access to affordable, reliable, sustainable and modern energy for all” and to “make cities inclusive, safe, resilient and sustainable”. By the same token, global action programmes for the most vulnerable developing countries, such as the Vienna Programme of Action for Landlocked Developing Countries for the Decade 2014-2024, identify transportation, energy infrastructure and information and communication technologies as among the priorities for achieving sustainable and inclusive growth in landlocked developing countries, due to their impact on trading costs, competitiveness and integration into the world market, and on productive capacity.

When it comes to economic growth, infrastructure has a key role to play: it articulates the territory, it supports human settlement, and it lays the foundations on which the other factors of production interact. The network services of energy, transport, telecommunications and water and sanitation infrastructure constitute a central element for integration of the economic, social, and territorial system of a country, making possible transactions within a given geographic and economic space. The improvement of infrastructure and its services promotes productivity and, with it, economic development—and the lower its initial endowment the greater will be the impact of any improvement. Similarly, infrastructure reflects and conditions the productive structure of a country or a region, and it may work for or, in many cases, against structural change.

In Sub-Saharan Africa, a region that has based its development to a large extent on the export of natural resources, much of the economic infrastructure has

been designed to facilitate such exports, without much heed to the opportunities for creating productive linkages and boosting value added. Structural change will not be achieved without an improvement and overhaul of transportation, energy, water and telecommunications infrastructure, making it more feasible and more profitable for the region to process its natural resources into intermediate or final goods in the future. Similarly, a greater degree of productive specialization and the development of competitive advantages on regional and global markets will require the integration of physical infrastructure that provides the connectivity and accessibility needed to move goods and services within the required quantity, quality, safety and time benchmarks.

From the social viewpoint, infrastructure can for example enhance access for the poorest people to education and health services, facilitate the supply of drinking water and energy, or protect public health by offering greater defences against natural disasters. Moreover, it can have the indirect effects of boosting agricultural productivity, reducing transportation costs, fostering integration into global markets, and creating jobs. However, the relationship between infrastructure endowment and poverty reduction is not straight-forward. If infrastructure is not specifically designed to pursue objectives of sustainable and inclusive development in an orderly and systematic manner, it may not result in economic and social progress, and may even be regressive. There is a very complex set of variables and factors to be considered for ensuring that infrastructure development will contribute effectively to improving the well-being of the underprivileged.

Lastly, Infrastructure has a profound effect on the consumption patterns of its users: the choices as to which infrastructure facilities will be built, and the manner in which they are designed, will have a significant effect on energy consumption as well as emissions levels. For example, according priority to highway construction will favour the use of private automobiles fuelled by hydrocarbons, over the use of public transit systems, implying an enormous future demand for fossil fuels for this type of individual transportation, and hence continued growth in emissions of polluting gases. In this respect, infrastructure development that encourages the use of more environmentally-friendly modes of transport is an element that will smooth the way to an economy with lower greenhouse gas emissions. Similarly, the expansion of urban drinking water and sewage services, without a concomitant investment in wastewater treatment plants, can cause serious problems of water pollution, with negative impacts on public health and on agricultural exports.

In this regard, it is a matter of great concern that, infrastructure development in Nigeria at this time is failing to maximize support for sustainable development

in any of its substantive dimensions. Thus, beyond recognizing the link between infrastructure services and industrialization, it is essential to understand that what the country needs is a greater and better endowment of infrastructure that is specifically designed and adapted to sustainable development purposes. To achieve this transformation, there must be a profound change in the design, financing, implementation and use of infrastructure in the country, and this implies a change in the sector's governance, i.e. in all the processes involved both in taking infrastructure decisions and in implementing those decisions, in which the mechanisms, procedures and rules established formally and informally by institutions all play a role.

Governance is broadly defined as the traditions and institutions that determine how authority is exercised in a country. According to Adamu (2016), governance encompasses the form of political regime; the process by which authority is exercised in the management of a country's economic and social resources for the development; and the capacity of government to design, formulate and implement policies and discharge functions. A shift from the notion of governance to good governance introduces a normative dimension addressing the quality of governance. From this perspective, good governance could be seen as the management of public affairs in the transparent, accountable, participatory and equitable manner. Put differently, good governance entails effective participation in public policy making, the prevalence of the rule of law and an independent judiciary, institutional checks and balances through horizontal and vertical separation of power and effective oversight agencies. Thus, for the government to be successful in the implementation of the sustainable development policies, it must demonstrate good governance per the people's standards. Once the government is not thought of as credible, then it becomes damaging to the measures of sustainable development (Towah, 2019).

In Africa, good governance has been quite elusive and attaining sustainable development has remained a mirage. This is because the governments' policies have not been focused on the people as defined by the concept of sustainable development. Since the 1980s, governance has been a debatable topic and scholars, international organizations, and governments have assumed different interpretations of good governance. World Governance Indicators defined good governance as the practice and foundations by which power is exercised within a given country; the procedure by which governments are selected, held accountable, monitored, and changed; the capacity by which governments manage resources efficiently and formulate, implement, and enforce sound policies and regulation; and the respect for the institutions that govern economic and social interactions. The United Nations Development Program

defined good governance in the human development framework as democratic governance where human rights are respected and accountability and participation in the decision-making process is upheld.

Good governance also entails responsiveness and focuses on poverty eradication, inclusiveness, equity, impartiality, fairness, outpacing any discriminatory practices, taking into consideration the present and the future generations (United Nations Development Program, 2002).

The difference that good governance makes to development can never be understated. To put it into perspective, whenever government performance is poor, the resources are wasted; services remain undelivered; and citizens, particularly the poor, are denied of legal, economic, and social protection. To this end, good governance is an imperative to sustainable development and reduction of poverty.

Infrastructure is a key element of poverty alleviation. It often acts as a catalyst to development and enhances the impact of interventions to improve the poor's access to other assets, such as human, social, financial, and natural assets. Its impact is felt both on the economic and social sectors. Without roads, the poor are not able to sell their output on the market. Without electricity, the industrialization process, which provides the poor an important source of employment, is unlikely to take off. Without potable water and sanitation health is at risk. The social and economic impact often go hand in hand (Gaal and Afrah, 2017).

Poverty reduction requires economic growth which, when accompanied by sound macroeconomic management and good governance, results in sustainable and socially inclusive development. The availability of infrastructure facilities and services as well as the efficiency of such services to a large extent determine the success or otherwise of all other production endeavour. Lack of basic infrastructure makes it difficult for poor people to access markets and services. Therefore, investments in infrastructures such as energy, water, transportation and communication technologies promote economic growth and help to alleviate poverty and improve living conditions through industrialization.

An inter-sectoral linkage of infrastructure generates positive externalities and multipliers that are useful for industrial growth. Positive externalities and the multiplier effect of infrastructure such as energy infrastructure provide the right environment for citizens to acquire knowledge, which, in turn, enhance productivity (Udah and Ebi, 2017).

Inclusive and sustainable industrialization, together with innovation and infrastructure, can unleash dynamic and competitive economic forces that generate employment and income. They play a key role in introducing and promoting new technologies, facilitating international trade and enabling the efficient use of resources. However, the world still has a long way to go to fully tap this potential. Least developed countries, in particular, need to accelerate the development of their manufacturing sector if they are to meet the 2030 target and scale up investment in scientific research and innovation.

Global manufacturing growth has been steadily declining, even before the outbreak of the COVID-19 pandemic. The pandemic is hitting manufacturing industries hard and causing disruptions in global value chains and the supply of products. In Nigeria for instance, Uda and Ebi (2017) observe that, industrial development indicators such as share of manufacturing in industrial output, manufacturing per capital, level of manufacturing export, index of industrial output, capacity utilization, are still below desired policy objective. Nigeria needs industrialization to achieve prosperity and a decent standard of living for her citizens. But this can only be achieved through good governance policies and infrastructure development. The lack of these two critical factors have largely undermined the industrialization trajectory in the country.

There is need for Nigeria to be industrialized to add value to her huge raw materials and services. Access to finance and markets is key to promoting industrialization. However, failure in designing governance policies can be a serious downside for promoting the sector. Industrial policies are more likely to achieve results if targets are agreed upon in a collaborative manner, involving the private sector as well as the competent public entities and civil service organizations. "There is a need to look into the settlement framework, the distribution and marketing strategy, as well as productive integration and focus on tax policies. Industrialization is a long-term process of more than 20 to 50 years, which requires incredible commitments and leadership, as well as appropriate policy in public sector procurement. While there is need to focus on attracting foreign investments, leveraging domestic and regional markets is necessary. There is need to have functional states with effective leaders. We need to get the policies right, and build a nation with leaders capable of building and leading industrial policies.

Overall, Nigeria's industrialization would have a more positive impact on the country's Gross Domestic Product. However, for this to happen, a comprehensive and resolute industrial policy that can be aligned with countries' development goals, should be designed. Given this scenario, the industrial settlement framework as well as infrastructure development and good governance, are particular dynamics to be looked into.

This study therefore seeks to evaluate the impact of infrastructure and good governance on industrial development of Nigeria and the impact of good governance on infrastructural development.

2 LITERATURE REVIEW

2.1 Conceptual Issues

Industrialization is seen as a socio-economic process of quick transformation within the manufacturing sector in relation to a plethora of avenues of production and work done within an economy. It encompasses the added value of the manufacturing sector when the overall size of the economy is considered. In accordance with Gui-Diby and Renard (2015), when the level of development in the manufacturing sector is comparatively high with regard to other sectors within an economy, the industrialisation rate in the country is also relatively high. With this understanding, two dimensions are essential for the consolidation of the industrialisation process, (i) the provision of incentives of production to the manufacturing sector and (ii) the sustainability of production in order to meet requirements at the local and international levels.

The enabling incentives for production require in the manufacturing sector could be requisite infrastructural development and good governance. Infrastructural development of any nation requires the creation of basic foundational services to enhance economic growth and quality of life. Rigorous infrastructure building have better efficiency and competitiveness (Davies et al, 2019). Sustaining production in order to meet national and international taste requires development of some basic infrastructure such as rail and road networks, energy, water treatment and flood prevention, systems for reuse and recycling that prevent harmful waste from entering the environment, digital infrastructure, communication networks and computing facilities, social infrastructure such as schools, hospitals, emergency services, community support, public space, libraries and cultural institutions, resilience provision of shelter in time of natural disaster such as flooding and earthquake shelter and government services such as consumer protection and fair competition regulations and enforcement (Diugwu et al, 2015 and Babatunde, 2019).

While many developments in the world economy depend on external factors that are hard to influence, steadfast leadership from indigenous policymakers can help improve domestic governance and ensure that public resources are well used and thus contribute to shared and lasting prosperity. However, it has been observed that enhancing governance and integrity in public affairs is probably sub-Saharan Africa's most urgent challenge to sustainably root poverty out of the region. Poor governance, including lack of basic freedoms, such as citizens' rights to hold their government accountable, has held back most countries in the region from entering the club of emerging middle-

income countries, and has prevented others from escaping the fragility trap. Thus, for the region's average GDP per capita to move to upper- middle-income status, growth will need to increase sustainably by 2 percentage points to 7 percent over a minimum of 15 years. Improvements in governance will also reduce inequality substantially. The combined impact of better governance on growth and inequality will accelerate the eradication of poverty in the continent (Newiak, et al, 2022).

The existence of functional infrastructure in an economy makes industrial productivity more of a breeze through promotion of investment, movement of products, people and services, and facilitation of information and communication (Orji et al, 2017). However, the deplorable situation of most of the infrastructural facilities in Nigeria as well as their lack of maintenance especially of the roads, electric power, and water, tend to limit the contribution of infrastructure to industrial growth and development in Nigeria. Lack of transparency and accountability in governance has resulted in inadequate funding from government for maintenance of these facilities. Careless use, vandalization, corruption, and delays in construction has resulted in poor state of infrastructure which invariably leads to low industrial productivity. Industrialists afraid of increasing cost of production and limited patronage especially from the government agencies are discouraged to venture into manufacturing activities. This in turn leads to lower national income.

The table below shows performance of all six indicators of governance in ECOWAS countries for 2010-2019 average.

Table 1: Governance indices performance in ECOWAS countries (2010-2019 average)

Countries	Voices /Accountability	Political stability	Governance effectiveness	Rule of Law	Control of corruption	Regulatory Quality	overall	Ranking
Benin	52	59.7	60.7	66.1	56.7	60.9	58.6	4th
Burkina Faso	53.4	56.7	56.5	57.4	57.6	60.9	54	6th
Cape verde	68.4	76.6	73	76.2	58.6	68.8	73.1	1st
Cote d' Ivoire	44.4	54.2	50.8	58.2	49.9	56.9	53.9	7th
Gambia	42.9	57.1	56.4	58	50.7	60.2	55.9	5th
Ghana	68.3	69.7	62.8	66	40	63.5	64.3	2nd
Guinea	35.5	38.3	46.4	43.4	26.7	53.2	42.5	14th
Guinea Bissau	40.8	47.5	30.2	48.5	21.6	52.5	41.4	15th
Liberia	56	54.9	46.5	54.9	30.2	43.9	47.9	10th
Mali	47.3	42.2	47.3	45.1	32.9	52.3	46.6	12th
Niger	41.2	49.5	50.4	52.7	46.6	53.8	47.8	11th
Nigeria	49.5	43.6	50.1	44.3	29.5	45.5	45.5	13th
Senegal	53.8	64.3	67	68.2	59.5	60.9	63.2	3rd
Sierra Leone	49.4	56.8	59.6	56.2	43.9	42.5	51	8th
Togo	27.3	48.2	56.3	51.3	45.5	47.7	50.1	9th

Source: Adapted from Mo Ibrahim Index of African Governance Report, 2020.

Voice and Accountability (VA) The index for Voice and Accountability captures perceptions of the extent to which the citizens are able to participate in selecting their government, as well as freedom of expression, freedom of association, and a free media.

Political Stability and Absence of Violence/Terrorism (PV) The index of Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood that the government will be destabilized or overthrown by unconstitutional or violent means, including politically-motivated violence and terrorism. The index is an average of several other indexes from the Economist Intelligence Unit, the World Economic Forum, and the Political Risk Services, among other

Government Effectiveness (GE) The index of Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Regulatory Quality (RQ) The index of Regulatory Quality captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development

Rule of Law (RL) The index for Rule of Law captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence

Control of Corruption (CC) Capturing perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

All the indicators are taken as 100%. This means, the higher the indicator, the better governed a country is and the lower the indicator, the poorly governed a country is.

From the table above, Cape Verde performance is more impressive with the average indicators of 73.1%, this is followed by Ghana, Senegal, Benin, Gambia, Burkina Faso, cote d'Ivoire, Sierra Leone and Togo in that order. On the average, Nigeria ranking is poor in terms of overall governance. A growing volume of literature suggest that lack of quality governance hinders growth and investments, and aggravates poverty and inequality (Adamu, 2016).

In terms of government effectiveness, Nigeria only ranked above Mali,

Guinea, Guinea Bissau and Liberia. Using the rule of law as indicator of governance, it is found that Nigeria ranked only above Guinea while it ranked below every other country. In terms of fighting corruption and regulatory quality, Nigeria performance is abysmal. This indicates that Nigeria is badly governed and that ease of doing business especially by private individuals is not guaranteed. Absence of industrialization due to corruption and lack of regulatory framework no doubt chase away foreign private investors and makes the economy suffers high level of unemployment.

Consequently, a well-industrialized economy is expected to have adequate regulatory quality framework that will impact positively on the industrial sector of the economy which is seen as an engine of economic growth. Availability of adequate and efficient infrastructural set-up not only improves the quality of life of the people but also promotes rapid industrialization (Azolibe and Okonkwo,2020).

2.2 Theoretical Framework: Infrastructure-Led Development Theory

The theory of infrastructure-led development was proposed by Professor Pierre – Richard Agenor in 2006 in a discussion paper series of the Centre for Growth and Business Cycle Research at the University of Manchester. In the final version of this theoretical postulation in February 2010, the theory proposed a long-run development linked to public infrastructure being the key mechanism of growth (Agenor, 2010). The justification for this basic thesis of Agenor’s (2010) is that the lack of growth and development in many low income countries is attributable to lack of infrastructure. With particular reference to sub-Saharan Africa, Agenor (2010) observed that only 16% of roads are paved, and that less than one out of five Africans statistically have access to electricity.

The justification of Agenor’s (2010) theory of infrastructure-led development is hinged on two key motivations. The first justification is that infrastructural investment must reach a certain minimum level before it begins to produce any significant effect on development and as such investments in infrastructural provisions beneath the threshold from where it begins to have effect is not proportionate to the zero level of developmental effect at that level. This assumption explains the non-linearity relationship held by the theory (Agenor, 2010). Secondly a network-chain of effects on other developmental catalysts is recognized and incorporated in the position of the theory. In this light, the World Bank (1994) also agrees that the short coming of not achieving economies of scale from network externalities is a major setback of geographical locations lacking in infrastructural provisions.

As noted by Prakash (2018), Africa faces development gaps at two main levels:

geographical and industrial. Geographical development gaps are the differences in income levels and development stages amongst countries or regions within a country. Industrial development gaps refer to differences in productivity and development stages between multinational and local firms, large firms and small and medium enterprises (SMEs), and manufacturing and non-manufacturing sectors. Planned infrastructure development and connectivity improvements can positively exploit the diversity amongst countries and sub-regions to narrow these development gaps in Africa. Geographical development gaps can be reduced through participation in production networks. Infrastructure enhancements enable countries or sub-regions to attract manufacturing industries. They also allow people to move from rural to urban areas. The smooth movement of people from agricultural, informal occupations in rural areas to formal, nonagricultural occupations in urban areas is an effective way to raise incomes and supply competitively priced labour to the manufacturing and modern services sectors.

2.3 The Empirics

Usah and Ebi (2017) examined the importance of infrastructure and human capital on industrialization in Nigeria using time series data from 1970 to 2014. The study captured the interrelationship among the variables with Pairwise Granger causality test and used Ordinary Least Squares (OLS) estimation technique. The parsimonious results suggest that gross domestic investment, electricity supply and trade openness are the required elements to accelerate the pace of industrialization in Nigeria. This implied that providing adequate and stable supply of electricity, deepening public and private investments as well as opening the economy to the vagaries of international trade has short and long-termed lasting effect on industrial development. The policy perspective is that government should prioritize the generation and distribution of electricity, increase the quantum of investments in road infrastructure and opening of the economy in order to accelerate the pace of industrialization

Orji et al, (2017) analysed the effects of infrastructure on the industrial sector of Nigeria. In that vein, ordinary least square method of regression analysis was adopted, using time series data spanning from 1990 to 2015. Industry value-added (% of GDP) was used as an indicator of Nigeria's industrial sector performance, while index of electricity consumption, gross capital formation, and federal government spending on transport and communication were used as indicators for infrastructural development. The results of the regression showed that the index of electricity consumption exerted a positive but insignificant impact on industry value-added; gross capital formation and federal government spending had a negative but significant impact on industry value-added on industry value-added. The study recommended that measures

to revamp and maintain the power sector of Nigeria must be taken seriously to ensure better supply of power. It was also recommended that corruption be curbed and projects, for which funds are disbursed, be properly monitored so as to ensure that efficient and long-lasting infrastructure will be built and properly maintained to encourage greater industrial output.

Asongu and Adhiambo (2019), examined the role of governance in modulating the effect of capital flight on industrialisation in Africa. The empirical evidence was based on Generalised Method of Moments and governance was bundled by principal component analysis, namely (i) political governance from political stability and “voice and accountability”; (ii) economic governance from government effectiveness and regulation quality; and (iii) institutional governance from corruption-control and the rule of law. First, governance increases industrialisation whereas capital flight has the opposite effect; and second, governance does not significantly mitigate the negative effect of capital flight on industrialisation. The implication is that to boost ongoing industrialization efforts in Africa, the governments of African countries would have to increase their efforts towards improving good governance in view of potentially mitigating the adverse effect that capital flight has on industrialisation.

Azolibé and Okonkwo (2020), examined whether the state of infrastructure development in Sub-Saharan Africa actually stimulates industrial sector productivity, using a panel data set of 17 countries spanning from 2003 to 2018. The study used panel least square estimation technique to examine the relationship between the variables. The result of the study indicated that the major factor that influences industrial sector productivity in Sub-Saharan Africa is their quantity and quality of telecommunication infrastructure. Analysis shows that the relatively low level of industrial sector productivity in Sub-Saharan Africa is largely due to their poor electricity and transport infrastructure and underutilization of water supply and sanitation infrastructure. Practical implications – The government should partner with other developed countries of the world such which are the top ten countries in infrastructure ranking as currently released by the World Bank, to equally extend their quality infrastructure to their own country for enhanced industrialization.

The reviewed literature no doubt supports the infrastructure –led growth theory by confirming the relevance of infrastructure to industrialization. What is missing in some of the works is that the researchers had not shown the link between industrialization and governance and between governance and infrastructure. This study fills that gap. Even when governance and industrialization are discussed, the discussion are taken in aggregate without

being country specific. The present study apart from looking at industrial and infrastructural development, it extends to industrialization and governance and how infrastructure itself can be affected or influenced by governance in Nigeria.

3 METHODOLOGY AND MODEL SPECIFICATION

3.1 Model Specification

This study seeks to determine the link between industrialization and infrastructure and governance and how governance can influence the quality of infrastructure. Following Adamu (2016), this study adopts econometric approach to establish the cause and effect relationships among variables of interest. In view of this, we adopt a regression model of the form;

$$IND_t = f(X_{it}, Y_{it}) \quad (1)$$

Equation 1 implies that industrialization at a given time (IND_t) is dependent on good governance and infrastructure. Where X_{it} is the vector of governance indicators and Y_{it} is the vector of quality of infrastructure. If governance is represented by the six indicators of good governance, ie; voice and accountability (VA), political stability and absence of violence (PV), government effectiveness (GE), regulatory quality (RQ), rule of law (RL) and control of corruption (CC) and if infrastructure is represented by transport network (TN), access to energy (AE), digital access (DA) and mobile communication. Then, equation 1 can be written as;

$$IND_t = \alpha_0 + \beta_1 VA + \beta_2 PV + \beta_3 GE + \beta_4 RQ + \beta_5 RL + \beta_6 CC + \beta_7 TN + \beta_8 AE + \beta_9 DA + e_i \quad (2).$$

Where;

α_0 = intercept

$\beta_1 - \beta_9$ are parametres

e_i = error term

However, because of paucity of data for estimation, infrastructure is taken in its aggregate form which consist of the index of transport network, access to energy, digital access and mobile communication. Hence, equation (2) is written as:

$$IND_t = \alpha_0 + \beta_1 VA + \beta_2 PV + \beta_3 GE + \beta_4 RQ + \beta_5 ROL + \beta_6 COC + \beta_7 Infr + e_i \quad (3)$$

Where $Infr$ is infrastructure and other variables are as earlier explained.

Thus, equation (3) establishes the relation between industrialization, good governance and infrastructure.

In determining the relation between infrastructure and good governance, we

formulate another equation.

$$INFr = f(\text{good governance}) \tag{4}$$

Equation (4) stipulates that infrastructure is a function of good governance.

Disaggregating good governance into its various components, we can rewrite equation (4) as;

$$INFr = \alpha_0 + \beta_1VA + \beta_2PV + \beta_3GE + \beta_4RQ + \beta_5ROL + \beta_6COC \tag{5}$$

Where Infr is infrastructure, while other variables are as earlier defined.

3.2 Data Source and Estimation Procedure

Data for this study was obtained from MO Ibrahim governance index report 2020 and www.theglobaleconomy.com. For the period 2000- 2020. Industrialization was measured by industry value added, governance by the six indicators of governance as explained earlier and infrastructure on the aggregate based on the various indices of infrastructure as explained earlier. To estimate the relationship between variables of interest, ordinary least square(OLS) estimation technique was used.

4 EMPIRICAL FINDINGS

Table 2: Result of the Relationship Between Industrialization, Governance & Infrastructure

Dependent Variable: Industrialisation.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	64.48601	39.43568	1.635220	0.1260
COC	-0.228328	0.242620	-0.941091	0.3638
GE	0.022781	0.063712	0.357567	0.7264
INFR	-0.156782	0.494733	-0.316903	0.7563
PV	7.720953	11.12137	0.694245	0.4997
ROL	13.74725	10.63194	1.293014	0.2185
RQ	-3.405686	9.116025	-0.373593	0.7147
VA	-40.06459	13.76632	-2.910335	0.0122
R-squared	0.694067	Mean dependent var		49.14429
Adjusted R-squared	0.529334	S.D. dependent var		6.149382
F-statistic	4.213288	Durbin-Watson stat		1.709975
Prob(F-statistic)	0.012305			

From the analysis, it can be seen that a negative and non-significant

relationship exist between control of corruption as an indicator of governance and industrialization, but government effectiveness has positive non-significant relationship with industrialization. Again, infrastructure has negative non-significant relationship with industrialization. However, political stability and absence of violence as an indicator of governance is positively and non-significantly related with industrialization. Also, rule of law is positively and non-significantly related with industrialization. But, regulatory quality is negatively non-significantly related with industrialization. However, voice and accountability has negative significant relationship with industrialization. This implies that industrializing without being accountable and giving attention to the needs of the people has negative influence on industrialization. Overall, it can be said that 69% variation in industrialization is explained by governance and infrastructure. Consequently, it should be admitted that inability of a system to control corruption and ensure effective functioning of the public service will result in poor state of infrastructure which will generate spiral effect on other sector of the economy negatively.

Table 3 Result of the Relationship Between Governance and Infrastructure Dependent variable: Infrastructure

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	57.12740	14.85722	3.845094	0.0018
COC	0.065262	0.129901	0.502402	0.6232
GE	-0.008940	0.034335	-0.260375	0.7984
PV	-6.411748	5.758346	-1.113471	0.2843
ROL	5.661988	5.540586	1.021911	0.3242
RQ	4.575885	4.770331	0.959239	0.3537
VA	15.78207	6.124889	2.576711	0.0219
R-squared	0.730605	Mean dependent var		51.06429
Adjusted R-squared	0.615150	S.D. dependent var		3.673729
F-statistic	6.328043	Durbin-Watson stat		2.274174
Prob(F-statistic)	0.002169			

Infrastructure whether hard or soft is germane to industrial development in any economy. The extent to which infrastructure can contribute industrial growth of an economy is a function of governance. The result above shows that control of corruption as an index of governance has positive and non-significant relation with infrastructure. This means that if there is improvement in the control of corruption, quality of infrastructure will as well improved. The

dearth of infrastructure in our polity can no doubt be traceable to corrupt influence of public office holders who will rather choose to divert public fund for private use. Government effectiveness and political stability are found to be negatively and non-significantly related with infrastructure. Since infrastructure in Nigeria is provided by the public sector, poor working of the public sector sometime due to incessant change in government structure can affect the provision and quality of infrastructure at a given point in time. This result no doubt show that when government is ineffective perhaps due to instability and increase in violent and insecurity, the likelihood of infrastructure deficit is certain. Rule of law and regulatory quality are found to be positively non-significantly related with infrastructure. What this implies is that when there is promotion of the rule of law, regulatory quality which would ensure good macroeconomic environment will be ensured and this will eventually result in infrastructure development. Voice and accountability is positively and significantly related with infrastructure. What this implies is that when the voice of the people are allowed through institution of true electoral process, accountability will result and this will eventually catapult to infrastructural development. This is because the masses will be considered in the cause of developing any infrastructure. On the whole, it is observed from the result that 73% variation in infrastructure is caused by good governance.

5 Conclusion and Recommendations

The significance of infrastructure and good governance as key to the industrial development and growth of any nation is not in doubt. Poor state of infrastructure in Nigeria is no doubt due to poor governance especially corruption in high places. It is also obvious that poor state of infrastructure inhibits industrial growth.

Poor performance of governance indicators clearly robs off on industrial and infrastructural sectors of the economy and send spiral wave across every other sector of the economy. Government effectiveness as an indicator of governance has an index of -2.5 to +2.5. The average value of the indicator for Nigeria during the period 1996-2020 was -1.03 points with a minimum of -1.21 points in 2009 and a maximum of -0.89 points in 2005. The latest value from 2020 is -1.03 points. This value indicates a weak government effectiveness.

Regulatory quality index like government effectiveness has an index range of -2.5 weak; 2.5 strong. Data for this indicator between 1996-2020 shows the average value for Nigeria during that period to be -0.89 points with a minimum of -1.35 points in 2004 and a maximum of -0.66 points in 2013. The latest value from 2020 is -0.96 points. Again, indication of weak performance.

Political stability as another indicator of governance has the range of -2.5

weak; 2.5 strong. Data for that indicator provided by the global economy for 1996 – 2020 shows average value for Nigeria during that period to be -1.81 points with a minimum of -2.21 points in 2010 and a maximum of -0.59 points in 1998. The latest value from 2020 is -1.86 points. Again, another indication of weak performance.

The weak performance of all the indicators as presented here no doubt affect infrastructural development and industrial growth in Nigeria. The fact that these two key areas (infrastructure and governance) perform woefully indicates that other sectors cannot do any better.

Voice and accountability index also ranges between -2.5 weak and 2.5 strong. The average value of the indicator for Nigeria during that period was -0.68 points with a minimum of -1.55 points in 1996 and a maximum of -0.32 points in 2016. The latest value from 2020 is -0.59 points.

Rule of law index (-2.5 weak; 2.5 strong): The average value for Nigeria during the period 1996-2020 was -1.12 points with a minimum of -1.43 points in 2003 and a maximum of -0.81 points in 2020. The latest value from 2020 is -0.81 points.

The fact that all the examined indicators are weak in their performance justify their relation outlook with industrialization and infrastructure. It is also worth mentioning that poor performance of the industrial sector exacerbates other vices in the economy such as unemployment, insecurity, youth restiveness, poor investment climate and poor institutional framework.

Thus, to ensure good governance with a view to ensuring infrastructural development and industrial growth, there must be genuine fight against corruption through institution of workable and efficient institutions and proper maintenance of the rule of law. Institutions of government should be ready to be accountable, transparent and diligent in the conduct of government businesses. The formation of EFCC and ICPC as anti-graft agencies was to prevent graft and high powered theft. Unfortunately, these institutions have been hoodwinked into the whim and caprices of the ruling class because of undue regards for the rule of law. More voice should be given to the electorates by ensuring the existence of efficient and workable electoral system. A system of probity where the citizens are not intimidated to question the use of their collective resources should be promoted.

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