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Infrastructural development and economic growth in Nigeria

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Abstract
The paper examines the empirical investigation between infrastructure facilities and economic growth in Nigeria using time series data that spans 1990 to 2020. The estimating technique is the Autoregressive Distributed Lag (ARDL) model. The indices of infrastructure are electricity, telecommunication technology and road transportation infrastructure. Real Gross Domestic Product is used to proxy economic growth. Two models are estimated. In the first model there is positive significant relationship between power sector and growth and negative significant relationships between both the road transportation and telecommunication on one hand and economic growth on the other. The second model is to show the influence of only telecommunication infrastructure on growth and it gives the desired result. It is therefore expedient for government to take steps at improving the development of infrastructure in order to contribute to economic growth. The government is also advised to evolve a policy of maintaining these infrastructures for longevity of the infrastructural facilities.

Keywords: ARDL, economic growth, electricity, infrastructure, transport, telecommunication.

1. Introduction

Infrastructural development is critical to the development of any economy. Without infrastructure no nation can lay claim to any meaningful development. Infrastructure is an engine of growth across Africa as it contributed about 99 basis points to per capita income for the period 1990 to 2005 (AIKP 2012). There is no gainsaying the fact that low levels of infrastructure is responsible for slow growth rate in the developing countries sub-Saharan African in particular. According to the publication by United Nation Human Settlement Program (2011), the power generation by the entire sub-Saharan Africa (SSA) with the population of 800 million is as much as the one being generated by Spain alone. And Spain has a population of 1/18th of the SSA countries. Another feature of the infrastructure decadence of the SSA is that most of these facilities are obsolete and lack maintenance coupled with the rate of urbanization in the region. The extent of urbanization is putting so much pressure on the existing available infrastructures. Urbanization involves the movement of people from the rural area to the cities. In a situation where the present levels of infrastructures are not improved upon or the stocks are not increased, then the available ones are being overused which account for low or nonperformance of such infrastructures. The stock of infrastructure in Africa is low especially considering power generation. According to Africa Economic Outlook publication of 2018, over 640 million people in Africa do

not have access to electricity. In SSA (outside South Africa) per capita consumption of energy is180 kWh compare with 13,000 kWh in United States and 6500 kWh in Europe. The development of infrastructures in SSA was stalled in the 1980s and 1990s due to the policies of International Monetary Fund (IMF) and World Bank that recommended structural adjustment programs (SAP) to these nascent economies. SAP aims at reducing the participation and influence of government in the economy. It was advised then that government should hand off participation in the economies suggesting that the economies should be private-driven. However, the economies of the African region were not well equipped to be either private-driven or market driven without strong infrastructures. In cognizance of this fact the Africa Development Bank launched the Africa Infrastructure Knowledge Program (AIKP) to improve the availability of statistical information on infrastructural development in the region.

Now coming down to the level of Nigeria, the country is not even among the best top ten countries in Africa according to the recent publication of Africa Infrastructure Development Index (AIDI). According to the African Infrastructure Index published by African Development Bank (AfDB), Nigeria is in 20th position out of 48 countries in Africa in terms of infrastructure development. This brings to the limelight the level of decadence of infrastructure in Africa's most populous country. According to the research conducted by the Research and Development department of Nigerian Communication Commission (NCC) 2021, the Nigerian government has taken series of measures at improving the state of infrastructural development. One of them is the National Integrated Infrastructure Master Plan (NIIMP) with the cost estimation of $3trillion that would cover core infrastructures like housing, water, energy and ICT. The plan is supposed to run for 30 years from 2013-2043. According to Okonjo-Iweala former minister of finance, Nigeria needs $14.2billion annually for the next ten years (from 2013) to take care of infrastructure. The Nigerian government is expected to provide $10.6billion. The government spends only $5.9billion leaving a shortfall of $4.6billion in form of infrastructural deficit. According to Global Infrastructure Hub which is the research unit of the World Bank, it is predicted that the Nigerian infrastructure deficit would hit $878 billion in 2040 considering the population growth of 2.4 percent and the GDP growth of 4.1% during the same period (Oxford Business Group 2020).

Nigerian economy cannot have appreciable economic growth without development in both economic and social infrastructures. This is due to the fact that they are crucial to the growth of informal sectors that support immensely the growing of the nation. The small-scale industries, the artisans all contribute to the economy in no small measures. Infrastructure development contributes directly to growth through its enhancement in the efficiency of labor and capital. An educated and healthy labor force through the social infrastructure (education and health facilities) increase the efficiency of human capital. The transmission mechanism from infrastructure to growth is that an educated person (that is social infrastructure) would have the capacity and training to increase productivity by virtue of the acquired education. Increase in productivity translate to increase in growth. This is the efficiency of labor which is categorized as the Total factor Productivity in the growth model. Furthermore, development of infrastructure is necessary for reducing

poverty (Anyanwu & Erhijakpor, 2009). Furthermore, the mechanism of transmitting of road infrastructure to growth is that quality road network are the means through which both agricultural and manufacturing products get to their destination. Improved road network, access to electricity all have the potentials to boost the incomes of the poor farmers that would be able to transport his farm products easily to the market. The poor artisans that have access to electricity would be able to increase his service/productivity and make more money rather than spending on alternative power generation that would add to cost and frustrate his business.

The present situation in Nigeria with infrastructural deficit even among its African counterparts calls for urgent action on the part of the government. For policy analysis and trying to get an in-depth knowledge of the level of infrastructure challenges in Nigeria, it is imperative that study focuses on Nigeria. The research analyzes the influence that electricity, telecommunication technology and road transportation infrastructures have on economic growth in Nigeria. The rest of the paper is structured thus: the next section is on Literature Review. This is followed by data and methodology in Section three. Section four details on discussion of result and interpretation while the final section concludes with recommendations.

2. Literature Review

Calderon and Serven (2008) investigates the contribution of infrastructure to growth and income inequality using a panel dataset of 100 countries from the period of 1960-2005. The evidence suggests that infrastructural development as denoted by improved in both quantity and quality of infrastructures has positive effect on long run growth and negative effects on inequality of income. According to the publication of the AfDB the low infrastructures in the continent of Africa is a manifestation of low developmental stage of the region. The publication traces it back to 1980s and 1990s when the International Monetary Fund (IMF) recommended the structural adjustment policy to the individual country to solve their debt problems. According to the publication in 1960s, Africa and Asia were on the same level of infrastructural development but due to the IMF/World Bank policies Africa's pace was really slowed down. It picks up again in 2002, but at a slow pace. In 2014 the population of African with access to electricity was estimated at 47 percent while that of Asia was at 89 percent for the same period. Balogun and Akinjole (2015) suggest that information and communication technology is a veritable tool in reducing youth unemployment and reducing inequality between the rich and poor in the assessment of the facilities. Lack of funds and electricity are some of the factors inhibiting against the harnessing of information and telecommunication technology in Nigeria.

Anyanwu and Erhijakpor (2009) investigate the effects of road transportation on poverty reduction in Africa. This is done by using panel data of 33 African countries for the period of 1990 to 2005. Results indicate that road infrastructure reduces the level of poverty in Africa. A 10 percent increase in road infrastructure reduces the level of poverty by 5.1 percent in Africa. Furthermore, confirming both theoretical and empirical literatures education. Inequality as proxy by Gini coefficient index is significant and positive implying that inequality is aggravating the poverty level in the region. Kodongo and Ojah (2016) use panel data analysis for 45 SSA countries from 2000

to 2011 investigate the effect of government spending on infrastructures on economic growth in the region. The estimating technique is the Generalized Methods of the Moment system (GMM). Specifically, the study investigates the increase in infrastructure access on economic growth, the effects of public spending on infrastructure on economic growth as well as quality of infrastructure on growth. Results revealed that public spending on infrastructure affect economic growth more in the region. Mafusire *et. al*., (2017) in their exposition on Africa's infrastructural deficits and investment opportunities portends that there are both infrastructural deficits and investment gap in Africa's infrastructure. The paper portends that there are opportunities for investments in infrastructures especially regarding the Low-Income Countries (LICs). The paper identified such areas as power, transportation and the telecommunication sectors. The paper suggests that the African economies should evolve investment friendly regulatory framework that can attract the necessary investors to invest in infrastructure since the government alone cannot fund infrastructure because of the huge capital demand.

Ogbaro and Oladeji (2021) use panel data of 41 countries from 1996 to 2015. The estimating technique is the first-difference GMM (FD-GMM). Introducing economic institution as a threshold variable in the estimation, the results show that for countries below the threshold, increase in infrastructure by 1 percent would increase economic growth by 0.16 percent. For countries above the threshold, increasing the infrastructures by 1% would increase growth by 0.35%. The implication here is that countries that have improved economic institutions would have their economies growing higher by 0.19% than countries without institutions. Improvement in telecommunication infrastructures would increase economic growth (David, 2019). This is examined in a panel dataset of 46 African countries from 2000 to 2015. The study uses a principal component analysis to determine the causal-effect relationship of the variables and results indicate that there are two-way relationship between telecommunication infrastructure and growth in the long run. This implies that there is a feedback relationship between telecommunication relationship and growth. Polyzos and Tsiotas (2020) reviews the import of transportation infrastructure to economic growth. The authors submit that transportation is an all-encompassing issue as it involves the movement of both goods and services with people. The paper suggests an evaluation of spatial changes among trading partners be considered in implementing such transportation infrastructure that would serve the needs of the region with the intent of promoting economic growth. Such spatial changes tend to reduce the distance between regions or states.

Improvement in availability and quality of infrastructure is germane to increasing economic growth in Nigeria (Nedozi, Obasanmi & Ighata, 2014). The paper uses simultaneous equation model and Ordinary Least Square (OLS) as the estimating technique. Findings indicate that there is a significant relationship between economic growth, availability and quality of infrastructures in Nigeria during the period of analysis. Edun *et. al.,* (2013) uses model of international trade to investigate the relationship between foreign investment and infrastructure with labor supply. Under the situation of total specialization, increase in supply of labor would lead to increase in government's provision of infrastructure. The increase in labor supply leads to increase in production which eventually results to increase in

foreign investment. In essence increase in government's infrastructure would lead to increase in foreign investment with labor supply as the linkage.

Okundaye, Fan and Dwyer (2019) is of the opinion that small-to-medium-sized enterprises have great potentials to contribute to economic growth in Nigeria through the adoption of information and communication technology. It raises the issue of lack of adoption of information technology which is hindering the positive contribution of this sector to growth. Using Technology Acceptance Model to predict users 'behavior towards the use of computers, the paper concludes that the use of ICT is low in Nigeria because of perceived low adoption of the facilities. Investment in form of Foreign Direct Investment in telecommunication technology is a driver of economic growth in Nigeria (Oyeniran and Onikosi-Alliyu, 2016) investigate the impact of investment in telecommunication technology on economic growth for the period 1980 to 2012. The paper uses time series data and employed Autoregressive Distributed Lag model (ARDL). Foreign Direct Investment and government expenditures on information technology infrastructure are used as proxy for infrastructure on information technology. Results indicate the existence of long run relationship between information technology infrastructure and economic growth. Aderogba, B. A. and Adegboye, A. A. (2019) in a panel data of 5000-panel households from 2010 to 2013 examines the relationship between road transportation infrastructure and household welfare during this period. The paper examines the analytical framework on the link between infrastructure development and poverty reduction within the Nigerian households. The findings show that road transport infrastructure reduces the distances to the major road by the citizens and thus reduces the likelihood of being poor. The paper concludes that road transport infrastructure reduces poverty.

Looking at the different papers reviewed above, it is discovered that most of them did not look at the long run relationship between the indices of infrastructure and economic growth. Some authors also use one index of capturing infrastructural development. This marked out the difference between the present paper and the past studies. The present study uses three indices of measuring infrastructure and the long-term impact of infrastructure on economic growth to be able to make appreciable inference from the analysis.

3. Theoretical Framework

The study adopts the traditional Cobb-Douglas production function model where both capital and labor are augmented by the efficiency factor *A*. In the present study while both capital and labor are traditional factors of production, here road transportation, electricity and information and communication technology (ICT) are introduced as the efficiency parameter that would lead to higher productivity or growth. They can also contribute negatively to growth if they are not adequately provided or not performing. The study uses the conventional growth model and replaces the 'A' in the growth model with infrastructure in order to achieve the objective of the study in examining the relationship between economic growth and infrastructure in Nigeria. This is based on the theoretical underpinning that infrastructure which is the efficiency factor in the present analysis assist both the capital and labor to increase productivity or economic growth. Hence:

$$Y = AK^{\alpha}L^{b} \quad (1)$$

Y is economic growth or output *a* and *b* are both elasticities of output with respect to capital and labor respectively. For the present study, equation (1) can be modified to include infrastructures which would be proxy by road transportation, telecommunication (ICT) and electricity exchange rate is included as a macroeconomic policy variable.

$$Y = LABO, GKF, ELEC, TRANS, ICT, REER \quad (2)$$

Y represents economic growth and is the dependent variable proxy by Gross Domestic Product. *LABO* is labor force, *GKF* is gross capital formation. Both labor and capital are the conventional labor and capital in the production function. *ELEC* is the proxy for electricity sector of infrastructure, *TRANS* represents road transportation. *ICT* is measuring information technology and *REER* is the proxy for exchange rate which is a macroeconomic policy variable. Electricity, ICT and road transportation are the independent variables representing infrastructures for the present analysis. Exchange rate is the macroeconomic policy variable which is affecting the provision of all the infrastructures in the economy because these facilities are imported. For the present study the issue is that all infrastructures are meant to enhance the productivity of the factors of production in order to improve economic growth.

4. Methodology

The study employs Autoregressive Distributed Lag model (ARDL) of Pesaran, Shin and Smith (2001). The ARDL is employed because of its applicability irrespective of the order of integration of the variables. It is also suitable in small samples. Furthermore, the technique identifies the cointegrating vectors in a situation where there are multiple cointegrating vectors. It also gives an efficient and realistic estimate of the variables. The procedure starts with the conduct of unit root test. In spite of the fact that the bound test does not require unit root test, there is need to conduct this test to ascertain that the series are not of order two I(2). According to Pesaran the system would crash if it is of order I (2). The series are both I(0) and I(1).

From equation (2) Y is the dependent variable while *LABO*, *GKF*, *ELECT, TRANS, ICT* and *REER* are all independent variables. Δy_t is model as a conditional Error Correction model (ECM).

$$\Delta y_t = \ell_0 + \ell_1 t + \beta_y y_{t-1} + \beta_x x_{t-1} \sum_{i=1}^{p-1} \alpha_i \Delta y_{t-i} + \sum_{j=1}^{q-1} \kappa'_j \Delta x_{t-j} + \partial' \Delta x_t + \varepsilon_t \quad (3)$$

Where ℓ_0 and $\ell_1 t$ are the intercepts β_y and β_x are the long run coefficients matrices for y_{t-1} and x_{t-1} respectively. The short run structure of Δy_{t-i} and Δx_{t-j} are to ensure that the residuals ε_t are error terms. Cointegration between y_t and x_t is done by OLS estimation of (3) through the F- statistics of joint significant of the coefficients of lagged levels in such a way that H_o=β_y=0, β_x=0 Pesaran, Shin and Smith (2001) showed that there is no standard distribution of the F-statistics under the null hypothesis irrespective of the integration of the regressors. They provided two critical values lower and upper boundary. If the estimated F-statistics falls below the lower boundary (and the variables are both I (0) and I (1) the null hypothesis of no contegration cannot be rejected. On the other hand, if the calculated F-statistics is above the upper boundary then it can be concluded

that there is cointegration. However, if the estimated F-statistics falls within both lower and upper boundary the result remains inconclusive.

The long run economic growth model can be specified from (4) thus:

$$LGDPK_t = \alpha_t + \nu LABO + \partial GKF + \lambda ELEC + \delta TRANS + \kappa ICT + \sigma REER + \varepsilon_t \quad (4)$$

From (4) *LGDPK* is economic growth, α_t is the intercept, $\nu, \partial, \lambda, \delta, \kappa$ and σ are all elasticity of economic growth with respect to labor, gross capital formation, electricity, road transportation, information technology and exchange rate respectively and ε_t is the error term.

The first step in the ARDL procedure is to conduct the unit root test

$$y_t = \partial y_{t-1} + u_t \quad (5)$$

It must be examined whether ∂ is one in which case it has a unit root against the alternative which is less than one. The Augmented Dickey Fuller (ADF) method of unit root test is adopted here. All the variables are stationary after first difference apart from electricity which is stationary at level. The implication is that all the variables have unit root apart from electricity and therefore the ARDL is applicable in order to determine the relationship between the dependent variable LGDPK and the other independent variables. This is shown in Table 1.

Table 1 Unit Root Test

VARIABLES	Unit Root at Level		Unit Root after 1st Difference	
	t-statistics	Probability	t-statistics	Probability
LGDPK	-1.90	0.06	-2.58	0.01
LABO	-1.90	0.62	-1.90	0.07
GKF	1.14	0.26	-3.95	0.00
ELEC	-6.85	0.00	-	-
TRANS	-0.64	0.52	-2.71	0.01
ICT	0.29	0.99	-3.36	0.08
REER	-2.47	0.33	-7.94	0.00

Source: *Author's Computation*

The long run ARDL (2, 2, 1, 1, 2, 2,1) is selected based on Akaike Information using lag 2.

The long run economic growth model is thus presented:

$$LGDPK_t + \alpha_t + \sum_{i=1}^{p} \varpi_1 LGDPK_{t-1} + \sum_{i=2}^{q} \varpi_2 LABO_{t-2} + \sum_{i=3}^{q} \varpi_3 GKF_{t-3} + \sum_{i=4}^{q} \varpi_4 ELEC_{t-4} + \\ + \sum_{i=5}^{q} \varpi_5 TRANS_{t-5} + \sum_{i=6}^{q} \varpi_6 ICT_{t-6} + \sum_{i=7}^{q} \varpi_7 REER_{t-7} + \varepsilon_t \quad (6)$$

The next step is to estimate the error correction model associated with the long run model that is re-parameterizing the ARDL model into error correction model thus:

$$LGDPK_t = \alpha_t + \varpi_1 LABO_t + \varpi_2 GKF_t + \varpi_3 ELEC_t + \varpi_4 TRANS_t + \varpi_5 ICT_t + \varpi_6 REER_t +$$
$$+ \sum_{a=1}^{p} \Re_a \Delta LGDPK_{t-a} + \sum_{b=1}^{q} \nu_b \Delta LABO_{t-b} + \sum_{c=1}^{q} \partial_c \Delta LGKF_{t-c} + \sum_{d=1}^{q} \lambda_d \Delta LELEC_{t-d} + \sum_{e=1}^{q} \delta_e \Delta LTRANS_{t-e}$$
$$+ \sum_{f=1}^{q} \kappa_f \Delta LICT_{t-f} + \sum_{g=1}^{q} \sigma_g \Delta REER_{t-g} + \psi ecm_{t-1} \quad (7)$$

ψ is the coefficient of error correction that measures the extent of adjustment back to equilibrium

Table 2 Estimate Results of Bound Test

Tests Statistics	Value	Signi. Level	Lower Bound I (0)	Upper Bound I (1)
F-Statistics	18.09	10%	1.99	2.94
		5%	2.27	3.28
		1%	2.88	3.99

Source: *Author's Computation*

There is cointegration between economic growth on one hand and LABO, GKF, ELEC, TRANS, ICT and REER on the other hand since the calculated F-statistics (**18.09**) is greater than the upper bound at the 1% significant level (**3.99)** as shown in Table 2.

5. Discussion of Results

Two models are estimated. The first model shows the simultaneous impact of all the three proxies of infrastructural variables-electricity, road transportation and information technology on economic growth. In this model, the traditional capital and labor are both significant. Real exchange rate which is the macroeconomic variable is also significant with the correct sign. Increase in exchange rate would have adverse effects on growth. All the variables of infrastructures are also significant. Improving the level of electricity by one percent would lead to rise in economic growth by 5.4 percent in the long run. It brings to limelight the importance of electricity in boosting economic growth. Increasing the road transportation by one percent would reduce economic growth by sixteen percent in the long run in Nigeria. This is quite informative considering the fact that most of the roads in Nigeria are in state of disrepair and so negatively affecting the economy. The normal theoretical expectation is that improvement in the road sector would increase economic growth. However, when the roads are not in good shape, then growth is impaired. Information technology is part of the driver of economic growth in Nigeria as suggested by the result in Table 3a. Increasing the information technology by one percent would reduce economic growth by seven percent. This is contrary to expectation especially considering the fact that the ICT sector is impacting highly on economic growth in recent times according to Central bank's publication. In the short run all the variables of interest are significant with negative sign. The electricity sector has a negative impact on economic growth in the short run implying that low supply of electricity would have an adverse effect on economic growth in the short run. Error correction result revealed that 35 percent of the deviation from equilibrium would be restored during

the year which implies a slow speed of adjustment.

The negative sign of the ICT impact on growth necessitates that a second model is estimated with ICT as the only infrastructure variable. In this second model ICT (Table 3b) is significant with the correct sign. Increase in the provision of information technology by one percent would increase the level of economic growth by two percent in the long run in Nigeria. The implication of the exchange rate result is that exchange rate as a macroeconomic policy variable has impact on the provision of infrastructures in Nigeria. Infrastructure is a highly capital project with high level of import dependency. The lower the exchange rate values in Nigeria the better the chances of providing more infrastructures in Nigeria. The diagnostic test is presented in Table 4. The stability test as shown in figures 1 and 2 reveal that the variables used in this analysis are stable over time since the cumulative square and cumulative sum of square are within the 5 percent stipulated expectation.

Table 3 Estimate Results of the Economic growth Model
Table 3a Model 1 with all the Infrastructural Variables

Dep. Variables LGDPK			
Variables	**Coefficients**	**Standard Error**	**t-statistics**
LELECTRIC	0.54	0.23	2.29**
LTRANS	-0.16	0.04	-3.62***
LICT	-0.07	0.02	-2.78**
LABO	0.93	0.27	3.35***
GKF	0.01	0.001	3.23**
LREER	-0.16	0.045	-3.550***
	SHORT RUN		
LELECTRIC	-0.56	0.08	-7.01***
LTRANS	-0.22	0.02	-10.39***
LICT	-0.07	0.01	-11.04***
LABO	-1.81	0.20	-8.69***
LREER	0.14	0.01	12.60***
ECT	-0.35	0.02	-15.39***

** is 5% level of significant and *** is significant at 1%
***Source**: Authors' computation*

Table 3b Model 2- ICT as the only variable of Infrastructure

Dep. Variable LGDPK			
Variable	**Coefficients**	**Standard Error**	**t-statistics**
LICT	0.02	0.01	2.40**
LABO	1.01	0.50	2.00**
REER	-0.001	0.01	-0.06

** is 5% level of significant and *** is significant at 1%
***Source**: Authors' computation.*

Table 4 Diagnostic Test Results

Residuals	Probability
Normality	0.064
Serial correlation	0.162
Heteroscedasticity	0.091
Stability	
Ramsey	0.017

Source: *Author's Computation*

Stability Test

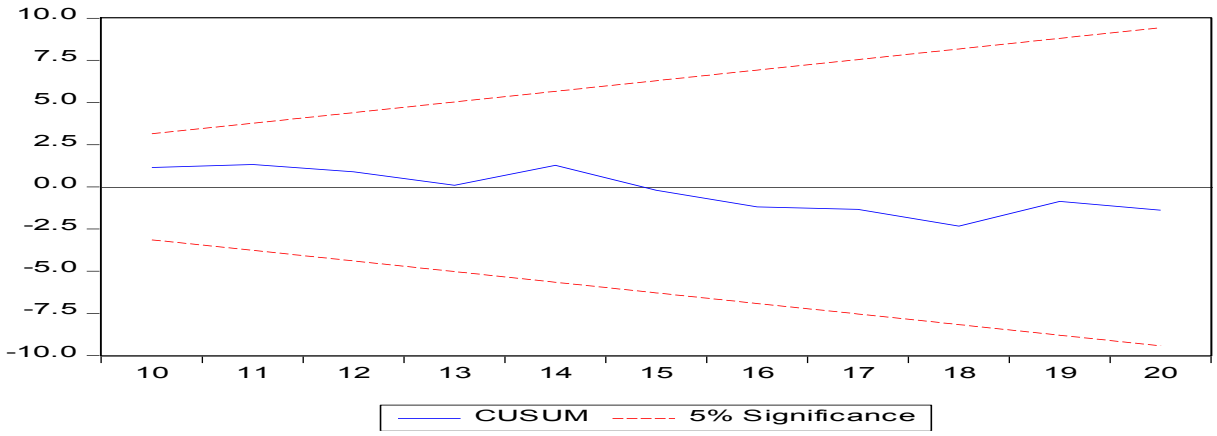

Figure 1: Cumulative square

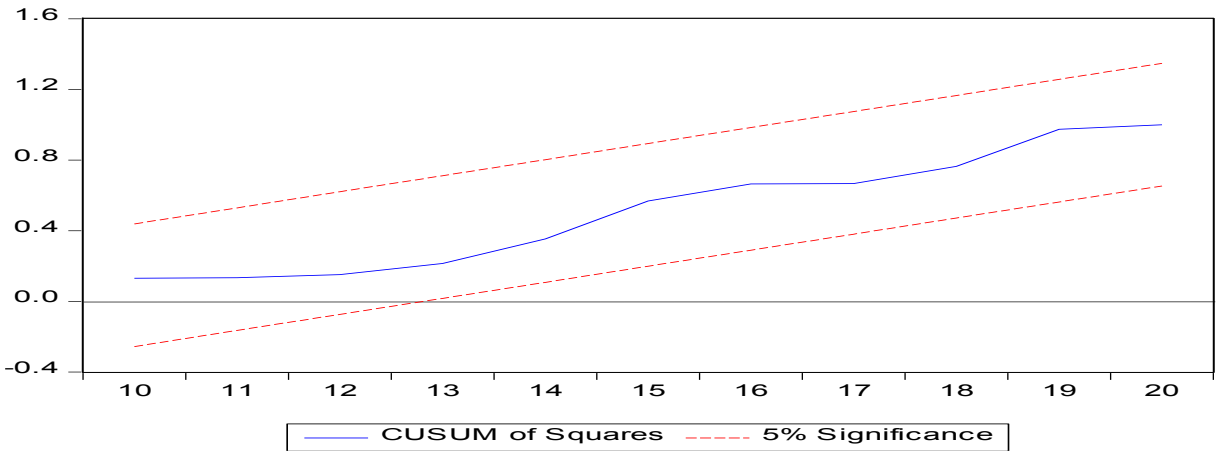

Figure 2: Cumulative sum of square

6. Conclusion and Recommendation

The short run result indicates that power sector has a negative impact on economic growth. This is the manifestation of the decadence in the power sector in Nigeria. The volume/measure of electricity being generated nationwide in comparison with

GDP is low. There is lack of political will by the government to resolve the power sector's problem. The people behind the deliberate inefficiency of the power sector should be brought to book. Imagine the generation of 6000 megawatts in a country of population of 200 million with GDP of #477.1 billion. In a report published by the National Bureau of Statistics (NBS) in Punch Newspaper stated that 48.6 percent of Nigeria's electricity supply is from generator. The report further stated that 51.2 percent of electricity is being provided by the national power grid (Punch Newspaper, 2021). This indicates that most Nigerians get electricity supply through generators. The volume of power being generated is really low compare with the need of the economy. It has been mentioned severally that the government needs to urgently overhaul the power/electricity infrastructure in order for it to contribute meaningfully to growth. Information technology is a new entrant in infrastructure and it is contributing immensely to Nigeria's GDP. The government needs to intensify the development of this sector and can also use it to empower the youth which would contribute to growth of employment.

The government is making positive steps to augment the road infrastructure by constructing rail system to reduce the pressures on the roads. More efforts need to be intensified by the government for the road transport system. Furthermore, as have been suggested in different fora, efficiency-driven private sector should be allowed to participate in the development of infrastructure in Nigeria. Infrastructure involves huge amount of funds that cannot be borne by the government alone. The policy thrust of the present study is that the regulatory framework be design to allow efficiency driven private sector to participate in the investment on infrastructure. This should be done in such a way that the interests of the Nigerian masses should not be sacrificed. In this case, the government can provide the policy framework to encourage private sector participation in infrastructure because it is obvious that the government on its own cannot fund infrastructure. Finally, the government should evolve a policy of build and maintain. The Nigerian government over the past years were interested only in building infrastructure without maintenance. Good maintenance culture tends to elongate the lifespan of these infrastructural facilities.

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