Electricity Supply and Economic Growth in Nigeria: A Bounds Testing Co-integrative Approach

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Abstract

The paper examines empirically, whether or not electricity supply and investment in electricity impact significantly and positively on economic growth in Nigeria over the sample period of thirty-six year from 1980-2017. The newly developed bounds testing approach to co-integration was adopted in the study. The results obtained reveal that both the short-run and long-run growth effects of electricity supply in Nigeria are significant and positive. Having ascertained the significance of electricity supply positively influencing economic growth in Nigeria, the study thus recommends a set of policies to the Nigerian government with a view to enhancing electricity distribution and fostering economic growth in Nigeria.

Keywords: Electricity Supply, Economic Growth, Bounds, Co-integration, Investment

JEL Classification: C32, Q43, O47

1. Introduction

Electricity is a flexible form of energy and critical resource for modern life and a vital infrastructural input for economic development. In all economies, households and companies have extensive demand for electricity. This demand is driven by such important factors as industrialization, extensive urbanization, population growth, rising standard of living and even the modernization of the agricultural sector. Nigeria is considered as one of the energy rich country in the world and rated among the top oil producers in Africa, second in natural gas reserve (with an estimate of 176trillion cubic feet) and estimated 2 billion metric tonnes of coal (Adeyemi & Ayomide, 2013). Nigeria is also rich in water, wind and sun energy from which appreciable electricity can be generated (Akinlo, 2009). With the abundance of energy resources, Nigeria need not import energy to achieve a sustainable generating capacity to suffices the targeted economic growth and also has excess generation to sell to neighbouring countries. With a population of over 180 million people, it is endowed with enormous energy resources, such as, petroleum, natural gas, coal, nuclear, tar sand. Others include solar, wind, biomass and hydro (Anaekwe, 2010).

However, development and exploitation of such energy sources have been skewed in favour of the hydro, petroleum and natural gas. At independence in 1960, agriculture was the dominant sector of the economy contributing about 70%. This trend changed with the discovery of oil in 1970. It has one of the largest natural gas reserves globally, with an estimated 182 trillion cubic

feet of proven reserves. And with abundant levels of daily solar radiation, estimates suggest that the country could generate approximately the daily energy equivalent of the energy from a 192,000 megawatt (MW) gas power plant working at full capacity for 24 hours a day (Akinlo, 2009).

However, consistent under-investment in capacity, sub-standard maintenance of power assets, and poor management of resources, gross inefficiency and corruption mean that power consumption per capita is one of the lowest in the world. As a consequence, individuals and businesses pay huge amounts to access electricity, adding up to 40% of the cost of doing business. This has a serious impact on Nigeria's competitiveness (Siyan & Ekhator, 2001).

The epileptic nature of electricity has increased consumption of petrol and kerosene because the citizens have resulted to using generators and kerosene powered equipment to provide energy for use at homes. Also, import content of our domestic fuel usage has grown over the years to about 75% (International Energy Agency, 2012).This has resulted in the use and overdependence on fuel-wood which has led to deforestation and attendant degradation of the environment and worsening desertification (Babanyara & Saleh, 2010). Babanyara and Saleh, (2010) report an average annual deforestation rate of 2.38% between 1990 and 2000 in Nigeria due in part to the change to the use of wood fuel as a result of hikes in prices of kerosene and cooking gas.

Past attempts to reform the power sector have failed to live up to expectations and substantial government under-funding for both complimentary capital projects and routine maintenance operations resulting in huge transmission losses. The objective of this paper is to examine the empirical impact of electricity supply and investment in electricity on economic growth in Nigeria. What are the implications of electricity supply and investment in electricity supply on economic growth? We asked this question because electricity supply is an important variable of economic growth. The paper is divided into five sections. After this introduction, section 2 is a brief review of previous studies. Section 3 contains data and methodology. Section 4 is the result and discussion and section 5 draws the conclusion and recommendations.

2. Literature Review
Previous studies had investigated relationship between GDP and aggregate energy consumption or total electricity consumption. Siyan and Ekhator (2001) argued that the installed capacity of electricity in the 1980s was about 6000MW but by 1990, the available installed capacity dropped to less than 2000MW and has continued to drop since then. Some of the plants which were available in 1980s were no longer available by 1990. Some of the reasons for the continued drop included inefficiency and corruption. In 1980, there were a total of 76 installed units with total capacity of 6000MW, but by 2001 only 22 units were available with total capacity of 2716.6MW and actual capacity generated being 2278MW. There was 338.6MW of generation loss from available capacity. By 2011, the installed capacity rose to 8644MW, but the actual capacity was put at 3200MW (Latham & Watkins, 2011).

Asafu-Adjaye (2000) investigated the existence of causal relationship between energy consumption and output in four Asian countries using the co-integration and error-correction mechanism and pointed out that unidirectional causality ran from energy consumption to output in India and Indonesia. However, bi-directional causality was found in case of Thailand and the Philippines. Akinlo (2009) conducted a study in Nigeria to investigate relationship between economic growth and electricity consumption during the period 1980 to 2006. The result exhibits that there is unidirectional Granger causality running from electricity consumption to real GDP and suggested use of electricity could stimulate the Nigerian economy.

Mojekwu and Iwuji (2012) carried out a study using time series analysis using a data of 1981-2009 to examine the impact of power supply, inflation rate and interest rate on capacity utilization rate in Nigeria. Data analysis was carried out using ordinary least square multiple regression technique. To improve linearity, they used log values of the variables. They concluded that electricity supply has a significant positive effect on capacity utilization at 5% level of significance, while inflation rate and interest rate had negative impact, the impact of interest rate was found to be significant at a p-value of 0.212 and 0.039 for f statistic and x-square statistic respectively. They found the impact of inflation to be negative but not significant at 5% level.

Study conducted by George and Oseni (2012) spanning 35 years from 1970-2005, found that total electricity supply to the industrial sector was not only less than the total going for residential use but was declining. Their study showed that the major driver of unemployment in Nigeria was attributed to insufficient and unreliable power supply to the industrial sector. Gado and Nmadu (2011) over a study of 14 years showed a strong positive correlation between electricity supply and capacity utilization in textile industry in the northwest zone of Nigeria. They concluded that the electricity sector in Nigeria needed emergency attention. Esso (2010) examines the long-run causality relationship between energy and economic growth for 7 sub-Sahara countries over the period 1970-2007 and applying bounds testing approach to cointegration, the findings suggest unidirectional relationship between GDP and energy consumption for all countries, while the result of causality indicates bidirectional relationship between energy consumption and real GDP in the case of Coted'Ivoire and unidirectional causality from real GDP to Congo. Justifying the first hypothesis on the basis of panel data from 158 countries for the period 1980-2004 and employing semi-parametric partially linear panel model, Von (2009) reports energy consumption leads to increase in economic growth and the effect of time trend is not significant.

In addition, Nondo and Kahsai (2009) applied the same techniques of panel unit root tests, panel cointegration and panel error correction model to estimate the causal relationship between energy consumption and economic growth for 19 COMESA countries for the period 1980-2005. Their analyses reveal that causation running from energy consumption to economic growth for low income COMESA countries. Olaniyan (2010) on the basis of panel data of 5 West African countries for the period 1970-2005 and employing Granger causality tests and cointegration analysis, the results show energy consumption does not cause economic growth suggesting that individual efforts may be inadequate; rather, regional cooperation to lower oil prices, increases access to cheaper renewable energy sources as well as increased intra-region energy trade should be encouraged.

Again study conducted by Pradhan (2010) using the time series data from China for the period 1970-2007 and applying production function and causality approach, he finds unidirectional causality from economic growth to energy consumption with infrastructure and transport as additional variables which also reports unidirectional causality as well. Employing different methodology and different time period for China, Shunyun and Donghua (2011) examines the causality between energy consumption and economic growth for the period 1985-2007 within a multivariate framework by applying fully modified OLS (FMOLS), the results indicate the presence of bidirectional relationship and economic growth which contradicts the findings of Pradhan (2010). Similarly, Viahinic-Dizdarevic and Zikovic (2010) apply the technique of error correction model (ECM) to investigate the role of energy consumption in economic growth from Croatia for the period 1993-2006, their results support unidirectional hypothesis. Khan and Qayyum (2007) using time series data of South Asia for the period 1972- 2004 and applying autoregressive distributed lag (ARDL) technique, the results support the evidence of causality

running from energy consumption to GDP in all countries in the long-run as well as in the short-run. However, a similar study by Zachariadis (2006) using panel data for the 5 OECD countries for the period 1965-2004 and applying different modern econometric methods (VEC, ARDL and VAR), discovers the aggregate energy use is granger caused by GDP. But differences in methods and datasets do not allow for a more in depth analysis. On the contrary, using the Leveraged Bootsrap Simulation technique on time series data from Sweden for the period 1965-2000, Abdulnasser and Manuchehr (2005) find that energy consumption does not cause economic activity but rather it is caused by economic activity. Erbaykal (2008) using time series data for the period 1970-2008 for Turkey and employing Bounds test approach, the findings suggest that in the short run both oil and electricity have positive and statistically significant effect on economic growth, however, in the long run oil consumption has positive effect on economic growth while electricity has negative effect.

3. Methodology

3.1. Data

The empirical analysis of the study is conducted by using time series data of total Electricity supply, total real Gross Domestic Product (GDP) and total investment for the period spanning from 1980 to 2016 sourced from Central Bank of Nigeria Statistical Bulletin (CBN, 2017) and World Development Indicators (WDI, 2017) of the World Bank. The choice of the starting period was constrained by the availability of time series data on electricity consumption and other control variables. The data of total electricity consumption is expressed in terms of Gigawatt hours (GWh) and obtained from annual report, published by National Bureau of Statistics. We used the GDP as the proxy for economic growth, which is a common choice in literature.

3.2 Unit Root Testing

Since this study deals with time series macroeconomic variables, there is need to test for unit root in each of the variables employed. The importance of this derives from the fact that estimation in the presence of non–stationarity in variables usually leads to biased and inconsistent estimates of the standard errors of the coefficients and this could lead to misleading inference if appropriate technique is not applied to overcome the problem. The unit root tests are carried out using the Augmented Dickey–Fuller (ADF).

3.3 Model Specification

The model of the study is used to determine the relationship between electricity supply and economic growth in Nigeria. Consequently, the model of the study is specified following the lead from Adeyemi and Ayomide (2013). The model is stated below.

$GDP_t = \alpha_0 + \alpha_1 ELSP_t + \alpha_2 IVES_t + \alpha_3 GCF_t + \alpha_4 PEXP_t + \varepsilon_t$ ……………………………...1

Where:

GDP = Gross Domestic Product which is a proxy for economic growth.

ELSP = Electricity supply in the economy

IVES = Goss investment in electricity supply in the economy

GFCF = Gross fixed capital formation

PEXP = Public expenditure

α = Regression Coefficients or parameters

ε = Stochastic Error Term

Equation one postulates (hypothesis) that economic growth is positively related to electricity supply, investment, Gross fixed capital formation and public expenditure. All the explanatory variables were tested for significance. The specified equation passed through the multiple

determination test (R-Square) and was also subjected to the Durbin-Watson (DW) test for auto correction.

3.4 Bounds Testing Methodology
The study employed the recently developed econometric technique of bound co-integration analysis in analyzing the data. This bounds testing co-integration technique is due to Pesaran, Shin and Smith (2001). It is a technique of testing the existence of a level relationship between a regressand and a vector of regressor, when it is indeed unknown with certainty whether the underlying set of regressor are trend stationary or first stationary.

The approach is based on the specification of an autoregressive distributed lag (ARDL) model. The econometrically illuminating advantages of the bounds testing technique include the fact that the endogeneity problems and inability to test hypotheses on the estimated coefficients in the long-run associated with the Engle-Granger (1987) method are avoided, the long and short-run parameters of the model under study are estimated simultaneously, the econometric methodology is devoid of the task of establishing the order of integration amongst the variables and of pre-testing for unit roots. By implication, the *ARDL* approach to testing for the existence of a long-run relationship between the variables in levels is applicable irrespective of whether the underlying regressors are purely $I(0)$, purely $I(1)$, or fractionally integrated.

In effect, the bounds testing approach allows a mixture of $I(1)$ and $I(0)$ variables as regressor with the implication that the order of integration of variables may not essentially be the identical. Therefore, the ARDL technique has the advantage of not requiring a specific identification of the order of the underlying data (Pesaran *et al*., 2001). Thus, the procedure is to test the significance of the lagged levels of the variables in a univariate equilibrium error correction mechanism. Pesaran et al (2001) developed two set of asymptotic critical values namely, set one is the set for purely $I(1)$ regressors and the other set is for the purely $I(0)$ regressors.

Following Pesaran *et al*. (2001), we assemble the vector auto-regression (VAR) of order *p,* denoted VAR (*p*), for the following growth equation:

$$G_t = \Theta + \sum_{i=1}^{p} \delta_i \, Z_{t-i} + v_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.2$$

Where Z is the vector of both the regressors and lagged values of the regressand, t is a time or trend variable. According to Pesaran et al. (2001), the regressand must be I(1) variable, that is, first differenced stationary, but the set of regressors can be either I(0) or I(1). The corresponding vector error correction model (VECM) is thus specified as follows:

$$\Delta G_t = \alpha + \phi t + \theta G_{t-1} + \sum_{i=1}^{p-1} \lambda_t \, \Delta Z_{t-i} + \sum_{i=1}^{p-1} \lambda_t \, \Delta G_{t-i} + v_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.3$$

Where Δ is the first-difference operator, *G* is the regressand defined as the growth rate of real *GDP* a proxy variable for economic growth, *Z* is the vector of regressor which we have in this study as electricity supply *(ELSP),* investment in electricity *(IVES),* gross fixed capital formation as a percentage of *GDP (GCFF)* and the public expenditure *(PEXP).* As usual, *t* is a time (trend) variable and $v\,t$ is a Gaussian stochastic disturbance term. The long-run multiplier matrix Θ is defined as:

$$\Theta = \begin{pmatrix} \Theta_{YY} & \Theta_{YX} \\ \Theta_{XY} & \Theta_{XX} \end{pmatrix} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.\ldots 4$$

The diagonal elements of the matrix are unrestricted, so the selected series can be either I(0) or I(1). If $0\ YY\ \Theta =$, then Y is I(1). In contrast, if $0\ YY\ \Theta <$, then Y is I(0). The VECM procedure is imperative in testing for at most one co-integrating vector between the regressand and the vector of regressors. Thus, following Pesaran et al. (2001) as in their Case III of unrestricted intercepts and no trends, having imposed the restrictions $\Theta YY = 0, \alpha \neq 0$ and $\varphi = 0$, our unrestricted error correction ARDL unrestricted error correction model can be derived as follows:

$$\Delta(GGDP)_t + \beta_0 + \beta_1(GGDP)_{t-1} + \beta_2(ELSP)_{t-1} + \beta_3(IVES)_{t-1} + \beta_4(GCFF)_{t-1}$$
$$+ \beta_5(PEXP)_{t-1} + \sum_{i=1}^{P} \beta_6 \Delta(GGDP)_t + \sum_{i=1}^{P} \beta_7 \Delta(ELSP)_{t-1}$$
$$+ \sum_{i=1}^{P} \beta_8 \Delta(IVES)_{t-1} + \sum_{i=1}^{P} \beta_9 \Delta(GCFF)_{t-1} + \sum_{i=1}^{P} \beta_{10} \Delta(PEXP)_{t-1}$$
$$+ v_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 5$$

Equation (3.3) is *ARDL* of order (*p, q, m, l, j*) which holds that economic growth is predisposed to be determined by its own lag, the lag values of growth rate of gross domestic product (*GGDP),* electricity supply *(ELSP),*investment in electricity *(IVES),* gross fixed capital formation *(GCFF)* and public expenditure *(PEXP).* The structural lags are conventionally determined on the basis of minimum Akaike's information criteria (AIC).

From the estimation of ARDL unrestricted error correction model, the long-run elasticities are the coefficients of one-period lag of the regressors (multiplied by a negative sign) divided by the coefficient of the one-period lagged value of the regressand (Bardsen, 1989). Accordingly, as in our *ARDL* model, the long-run elasticity effects of employment, capacity utilization, gross fixed capital formation and public expenditure are computed as $\left(\frac{\beta_2}{\beta_1}\right), \left(\frac{\beta_3}{\beta_1}\right), \left(\frac{\beta_4}{\beta_1}\right)$ and $\left(\frac{\beta_5}{\beta_1}\right)$ respectively. The short-run effects are obtained directly as the estimated coefficients of the first-differenced variables in the *ARDL* model.

3.5 The Wald Test for Short-run Causality: Zero Restriction Hypothesis
Having estimated our unrestricted error correction ARDL model, the Wald test based on the standard *F*-statistic was computed to establish the co-integration relationship between the variables in the study. The Wald test was conducted by imposing the following restriction on the estimated long-run coefficients of economic growth, employment rate, capacity utilization as percentage of *GDP,* and gross fixed capital formation as a percentage of GDP.

$$H_0: \begin{matrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{matrix} = 0 \ , \quad H_1: \begin{matrix} \beta_1 \\ \beta_2 \\ \beta_3 \\ \beta_4 \\ \beta_5 \end{matrix} \neq 0 \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots 6$$

The null (alternative) hypotheses hold that co-integration relationship does not exist (exist) respectively. The computed Wald statistic adjudged significant or insignificant on the basis of the critical values tabulated in Pesaran et al. (2001).

4. Results

Table 1: Augmented Dickey-Fuller Unit Root Test.

Variables	Constant		Constant & trend		None	
	Level	FD	Level	FD	Level	FD
GDP	-1.1153	-10.2656*	-1.9762	-10.2303*	-0.4156	-10.2711*
ELSP	-1.9229	-4.7717*	-0.4333	-5.1114*	1.7172***	-4.7688*
IVES	-1.2706	-10.2334*	-2.1328	-10.2345*	-0.0436	-10.2213*

FD signifies First Difference., ** and *** denote significance at 1%, 5% and 10% respectively*
Source: Authors' computation

From Table 1, it is obvious that all the variables are integrated of order 1 or 1(I). In other words, all the variables are said to be stationary at first difference. Therefore, we can safely conclude that first differencing is sufficient for modeling the time series adopted in this study.

Table 2: Bounds Results

Regressor	Coefficient	t- value
Constant	4.095*	25.605
Log (GGDP-1)	0.0269*	13.436
Log (ELSP-1)	0.826*	4.662
Log (IVES-1)	-0.002	-0.228
Log (PEXP-1)	1.052***	2.999
Log (GCFF-1)	1.228	5.656
Panel B: Short-Run Estimates		
Δ Log (GGDP)	0.224***	2.688
Δ Log (GGDP-1)	0.556*	4.082
Δ Log (ELSP-1)	0.426***	2.255
Δ Log (ELSP-2)	0.222***	2.856
Δ Log (PEXP-1)	0.244	1.452
Δ Log (PEXP-2)	0.244***	2.652
Δ Log (GCFF-1)	0.698*	2.226
Δ Log (GCFF-2)	1.062	9.466
Summary Statistics		
R^2	0.683	
Adj R^2	0.625	
Sum of Squared Residuals	0.0066	
Standard Error of Regression	1.0222	
F-Statistics	15.998	

*Note: ***, ** denotes statistical significance at the 1% and 5%levels.*
Source: Authors' Computation.

Table 3: Bound Testing Approach to Co-integration

Level of Significance	Critical Value	
α %	Lower	Upper
1% Significance*1	3.74	5.06
5% Significance*2	2.86	4.01
10% Significance*10	2.45	3.52
Computed F-statistic: 6.555***		

Note: critical values are cited from Pesaran et al. (2001). Unrestricted intercept and no trend.
*Refers to the number of estimated coefficients and *** denotes significance at 1% level*

Table 4: Long-Run Elasticity of Economic Growth with respect to Electricity supply in Nigeria

Variable	Long-run Elasticity
Log (ELSP)	0.568***

*Note: *** denotes statistical significance of the computed long-run elasticity at the 5% level*

Table 5: Short-Run Causality Results from the Wald Statistical Hypothesis Test

Variable(s)	Test Statistic (s)	p-value(s)
Δ Log (ELSP)	5.255*	0.0000
5 Δ Log (IVES)	12.255*	0.0000
Δ Log (GCFF)	2.562***	0.0000
Δ Log (PEXP)	13.002***	0.0000

*Note: *, *** denotes statistical significance at the 1 percent and 5 percent levels. Figures in parenthesis are the marginal significance values*

The Bounds results of the unrestricted error correction ARDL model are reported in table 2 above. The coefficient on electricity supply is positive and statistically significant. This indeed, empirically rationalized validate the hypothesis that electricity supply positively and significantly stimulate long run economic growth. For the control variables in the study, the results reported a negative long run impact on the growth rate of *GDP*. The finding thus implies that investment in electricity supply does not positively influence long run growth. For the control variables, *GFCF* is positively significant at ten percent significant level.

This finding shows that an increase in gross fixed capital formation will increase the economic growth in long run. The coefficient of model determination having adjusted for degrees of freedom is 0.625. As it were, 62.5 percent of the total variation in the growth of real output is corrected for within one year of adjustment. Thus, having adjusted for degrees of freedom, the estimated error correction model can be adjudged statistically fit and robust. The F-statistic is 15.998. This is highly significant. It implies an overall significance of the estimated model. This indeed is a re-enforcement of the goodness of fit of the estimated error equation.

The reported F ratio passes the significance test at the conservative half percent level of significance. This goes along extent to indicate the existence of a significant linear long-run relationship between the growth rate of GDP and the level of electricity supply in Nigeria. On the part of individual significance of each explanatory variable, it is evident that investment in electricity supply is vital for stimulating the growth rate of GDP in Nigeria. Gross capital formation also passes the test of significance at the 5 percent level of significance. In effect, these suggest that electricity supply, investment in electricity supply and gross capital formation economic growth are significant determinants of growth in Nigeria.

This further reinforces the fact that the results reported are of policy significance. The results of the bounds co-integration test rejects the hypothesis of no co-integrating relationship between the growth rate of *GDP,* electricity supply, investment in electricity, gross fixed capital formation and public expenditures at one percent significance level. In simple terms therefore, the results show that there is long-run relationship between electricity supply, investment in electricity supply, gross fixed capital formation, and total government expenditure proxy for public expenditure and *GDP* growth in Nigeria.

This is against the back-drop of the fact that the computed *F*-statistic of 6.555 is greater than the lower critical bound value of 3.74. The long-run elasticity of the *GDP* growth rate with respect to electricity supply is 0.568 in Nigeria, econometrically revealing the robustness of the estimated

regression results. All the tests disclosed that the model possess the desirable BLUE properties. Indeed, the model's residuals are serially uncorrelated, normally distributed and homoskedastic. Therefore, the estimated set of results is devoid of the econometric problems of autocorrelation, misspecification and heteroskedastcity.

Using the Wald statistical test procedure, the dynamic short-run causality effect was determined by placing the zero restriction on the coefficients of electricity supply, investment in electricity supply, gross fixed capital formation and public expenditure with their lag values also equated to zero. On the rejection of causality among the aforementioned regressors, we indeed establish that electricity supply, investment in electricity, gross fixed capital formation and public expenditure are statistically significant to granger-cause *GDP* growth rate in Nigeria at both the one percent and five percent significance levels respectively.

5. Conclusion and Recommendations

In this paper, we empirically explored the impact of electricity supply and investment in stimulating economic growth over a thirty-six year sample period. With electricity supply being the key variable under study, other regressors namely, investment in electricity supply, gross capital formation and public of all the aforementioned variables with the growth rate of GDP were tested on the basis of an estimated econometric model. Flowing from the empirical results is the fact that electricity supply and economic growth are positively related in Nigeria. The major finding is that electricity supply contributes significantly to GDP growth in Nigeria. This then suggest the need for policies to enhance electricity supply prospects with the ultimate aim of fostering a sustainable increase in the growth rate of real GDP. Thus, the Nigerian government should implement a broad set of electricity generating policies that can help abridge electricity shortage in the country. In addition, policies should be put in place to increase existing capacity. This is highly desirous considering the urgent need to aptly enhance the growth prospect of the economy.

Again, as investment positively affects GDP growth and electricity consumption affects investment, monetary authorities should undertake appropriate monetary policy to provide loan at cheaper rate in banking sectors. The enhancement of capitalization towards small investors at cheaper cost helps in expanding existing business and generates new business activities as well, the means of creating more employment opportunities, increasing purchasing power.

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