Analysis Of Energy Balance On Nigeria's Economic Growth: Evidence On Electricity Sector: 1970-2010

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ABSTRACT: This study analysed the effects of energy balance on Nigeria's economic growth, with specific focus on the electricity sector. The endogenous growth model complimented with an econometrics packages were adopted to determine the relationship between energy (electricity) demand, energy supply and energy balance: their stationarity and short and long run effects. The parsimonious estimate declared the relevance of electricity supply and demand to economic growth. To test the impact of electricity balance on economic growth, the second model included energy (electricity) balance, this resulted to overall change in influence and significance. The implication to the study is that the energy difference caused by excess demand is a strong determinant to the diabetic economic growth in the country. Against this background, this study suggests adequate funding, rehabilitation of existing power plants and construction of new ones to support the existing ones. Also recommended is the exploitation of nuclear sources of power supply, intensification of efforts to checkmate vandals and thieves of power apparatus, distilled massive private investment and incentives via multi year tariff order (MYTO) and gas sales agreement that eliminated direct government subsidies.

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1. Introduction

World economies are heavily reliant on energy and Nigeria is not an exception. Energy is the indispensable force driving all economic activities (Alam, 2006). And the ability of a nation to fully develop and efficiently manage its available resources in order to achieve economic development is linked to energy efficiency. Modern technologies used in production, allocation and utilization of these resources are designed and tied strictly to the use of energy.

Electric power supply is one of the basic infrastructure, prerequisite for industrialization, increase in aggregate investment, productivity and real Gross Domestic Product, growth in any economy as well as improvement in the quality of life (Ekpo, 2010). This explains why one of the most disturbing economic development issues in Nigeria since 1990's is that of inadequacy of electricity supply and distribution. Electricity problems or crisis persisted irrespective of availability of natural resources such as coal, hydropower, geothermal, solar and other renewable energy sources. Nigeria is a country with over 150 million people of which only 40 percent is linked to the national grid and this 40 percent is shot of power supply over 60 percent of the time (Kennedy-Darling, et al, 2008). The main demands for the majority of ordinary Nigerians are access to electricity, but often they are greeted with the persistent power outages, even at alarming frequencies; caused by outrageous gab or imbalance in electricity. To this end, to fill the gab, 98% of the firms use private generators and many Nigerians who rely solely on electricity for their daily businesses and survival have been pauperized and this has led to a more warped economic system against the less privileged, (Iwayemi, 1991and Ayodele, 1998).

We must come to terms with the fact that Nigeria's electricity is like a man suffering from multiple ailments and is in a state of coma. It is like a patient who needs multiple doctors to prevent him from dying (Opera, 2010). Indeed, electricity supply and distributions in Nigeria is facing Herculean challenges despite huge and continuous investment in the power sectors and additional power generation every year. Against this backdrop, the work is set to appraise energy balance in Nigeria's economic growth with specific focus on the electricity sectors. We shall also examine empirically the effects of capital employed, demand and supply of electricity on economic performance (real GDP) and determine if the attainment of energy balance is myth or reality on economic growth in Nigeria.

2. Energy Balance (Electricity Balance) and Economic Growth

Energy balance explains the relationship between energy consumption (electricity demand) and energy production (electricity supply) throughout the life time. It is an assessment or a process of

matching the demand for energy with supply of energy (the encyclopedia, 2010). Ordubu (2010) asserted that energy balance occurs when supply of energy is equal to or in excess of the demand for energy, or when demand for energy in excess of supply, (Ayodele, 2003); as in the case of Nigeria. While Abdullahi (2002) opined that the peak demand of energy demand on population and industrialization of a country. Therefore, if maximum supply meets the peak demand, surplus occur otherwise shortfall. The equation states that supply – Actual Needs – Losses = surplus; while losses = heat losses + wastage + Diversion.

2.1 Endogenous Growth Model

Odularu and Okonkwo (2009) contended that before the growth theory propounded by Romar, there were other which were in vogue. But his endogenous growth model is anchored on growth engined by exogenous factors such as technology. His most prominent assumptions are the diminishing returns to labour and capital and constant saving rate. Contrastly the Solow's model of long run capital growth is caused by rate of technology progress, exogenously determined (Udah, 2010). Romar's endogenous growth model, has structural resemblance to the neo-classical counterparts, differs rightly by replaces neoclassical diminishing marginal returns to capital investment with increasing return to scale in aggregate production. He focused on the role of externalities determining the rate of return on capital investment, and therefore investment in human capital generating external economies and production efficiency that offset diminishing returns (Todaro and Smith, 2003). Romar's (1986) production function is thus: Y=A(R) F(R,K,L,), where A is public stocks of knowledge from research and development (R); R, is stock of results from the stock of expenditure on research and development, K, is capital of firm, and L, is labour stock of firm. In this he further stated that the aggregate production of endogenous theory is Y = FCA, K, L); where Y = aggregate real output; K = stock of capital and : = stock of labour and A = technology (or technological advancement).

3. Empirical Findings

Odularu et al (2009), investigated the relationship between energy consumption and the Nigeria economy from the period of 1970-2005. He discovered that positive relationship exist between energy consumption (from oil, coal and electricity) and economic growth. However, the lagged values between energy consumption and economic growth were negative; exception of coal. Similarly, an investigation on impact of stabilization policies (monetary and fiscal policies) and electricity supply on economic development in Nigeria was carried out; the result was that supply of electricity is important drive for economic growth and development (Udah 2011).

Using bonds testing approach, Babatunde et al (2008), analysed the level of relationship between residential demand for electricity in Nigeria as a function of real gross domestic product per capita, and the price of electricity, the price of substitute and population between 1970 and 2006. It was discovered that the income, the price of substitute and population are the main determinants of electricity demand in Nigeria. Thus, our works is an extension, which investigated the joint impacts of energy demand and supply, and the difference (balance) on economic growth.

4. Methodology: Specification and Estimation Techniques

This study uses time series data for Nigeria based on annual observations covering the period 1971-2009. Secondly data used were obtained mainly from the World Bank Development Indicators (WDI). World bank statistics (2008), Central Bank of Nigeria Annual Report and statement of account, and Central Bank of Nigeria Economic and Financial Review, various issues and Central Bank of Nigeria statistical Bulletin (2004).

4.1 Model Specification

The model used for the study is based on the endogenous growth model used by stern (1991), Romer (1986, 1990), Sala-I-Marten (1990).
The endogenous production function is given as:
$RGDP=Ak^aL^b$……(1)
Where RGDP = Real Gross Domestic Product
A = Total factor productivity
K = Capital
L = Labour

But since factor productivity depends on the state of technology (tools, machines etc) which in turn is a function of energy (power), we model the total factor productivity as a function of electricity demand (consumption), electricity supply and electricity balance as follows:

A=(Es, Ed, Eb)…….(2)

Where Es = Electricity supply, Ed = Electricity demand or consumption and Eb= Electricity balance. By combining equation (1) and (2) we have

$RGDP=F(K^{a1}, L^{a2}, Es^{a3}, Ed^{a4})$……(3)

We would also note that energy balance exist when the supply of energy is equal to or in

excess of the demand for energy (Orubu, 2010 and Ayodele 2003).

Then equation (3) can be further compressed as:

$RGDP=F(K^{b1}, L^{b2}, Eb^{b3})$……(4)

As further noted by Ayodele (2003), when the demand for energy is in excess of its supply, it result to imbalance of the system which supposedly triggers a crisis situation.

4.2 Econometric Specification of the Models: I and II

From eq. (3) we have

$LOG(RGDP) = a_o + a_1 Log(K) + a_2 Log(L) + a_3 Log(ES) + a_4 Log(Ed) + ų$…… (5)

Apriori expectation is $a_0>0$, $a_1>0$, $a_2>0$, $a_3>0$, $a_4>0$

From equation (4)

$Log(RGDP) = b_o + b_1 Log(K) + b_2 Log(L) + b_3 Log(Eb) + ų_i$……..(6)

Apriori expectations is thus; $b_o>0$, $b_1>0$, $b_2>0$, $b_3>0$

From the above equation we take the natural Log of both the dependent and explanatory variables thereby converting it into double-Log model. The use of double-Log model is triggered by the fact that the model is a production function which appears in a non-linear form. In order to linearise it we take both the natural log of the dependent variables and explanatory variables.

Where a_0 and a_1 are the intercept terms in equation 5 and 6 respectively.

4.3 Data Analysis and Interpretation of Results

Unit Root Test for Stationarity:

A time series process is said to be stationary if "its mean and variance are constant over time and the value of the covariance between the two time periods depends only on the distance or gap or lag between the two time periods and not the actual time at which the covariance is computed" (Gujarati, 2003:797). This unit root is:

$H_o: \partial = 0$

$H_1: \partial < 0$ Alternative hypothesis

In a bid to ascertain the position of this problem, in this work, the researcher adopted the conventional augmented Dickey Fuller Test as follows: H_o = Non-stationary

Reject H_o if ADF test statistic is greater than the critical value in absolute terms except otherwise.

Models I and II

Variables	ADF Statistic	1% critical value	5% Critical value	10% critical value	Decision
D(LOG(RGDP (-1)))	-3.817178	-3.6228	-2.9446	-2.6105	Stationary at first difference
D (LOG (ED(-1)))	-5.729876	-3.6228	-2.9446	-2.6105	Stationary at first difference
D (LOG)(ES(-1)))	-3.627720	-3.6228	-2.9446	-2.6105	Stationary at first difference
D(LOG)(K(-I)))	-3.942444	-3.6228	-2.9446	-2.6105	Stationary at first difference
D(LOG)(L(-1))2)	-7.49409	-3.6289	-2.9472	-2.6118	Stationary at second difference
D(LOG)(EB(-1)))	-4.172157	-3.6228	-2.9446	-2.6105	Stationary at first difference

From the above table, it shows that all the variables became stationary after first difference at 5% significance level respectively except labour which is stationary at second difference. Therefore we can conclude that they are all integrated of order one and two i.e 1(1) and 1(2) thereby OLS regression may not produce "spurious" results since all variables are stationary at first difference and second difference. Now we proceed to determine if the variables have long – run relationship using co-integration test.

4.4 Co-Integration Test Result for Models I & II

Reject H_o if the absolute value of the ADF for statistics is greater than the absolute critical value at the chosen level of significance for the generated residual series, otherwise do not reject H_o.

The result is below:

Model I

ADF test statistics = -4.920256 1% Critical value -3.6228

Model II

5% critical value -2.9446

ADF test statistics = -3.386811

10% critical value -2.6105

From the result obtained, we therefore reject H_o and conclude that there exist co-integration among the variables thus a long run relationship exist among the model variables.

4.4 Error Correction Model

Since from our co-integration test result, there exist a long run relationship between the dependent variables and explanatory variable ascertain if the short run relationship still exist or there is disequilibrium in the short run, we make use of error correction model.

Applying the unit root test to the residuals from the regression, we found that the residual are stationary, suggesting that RGDP and the explanatory variables are co-integrated. Using this knowledge we obtained the following Error Correction Model (ECM).

Error Correction Model Result for Model 1

ΔLOG(RGDP)=-0.00767 + 0.17864ΔLOG(ED) - 0.006461ΔLOG(ES) + 0.154204ΔLOG(K)- 0.036970ΔLOG(L) -0.616045 RESIDUAL -1 + e_t---------- (7)

t= (-0.452789)C (0.181101)ED (0.050005)ES (3.151017)K (0.979642)L (3.202128)R R^2 = 0.322886, D.W =2.078803

Where Ut_{-1} is the lagged value of the error correction from the proceeding period. From the above regression result, the coefficient of the residuals is negative which conforms to a priori expectation.

Variables	Coefficient	Standard error	t-statistics	P value
D(LOG(K(RESIDUAL(-1)	-0.602705	0.179897	-3.350280	0.0019
D(LOG(L)RESIDUAL (-1)	-0.308435	0.176517	-1.747387	0.0893
D(LOG)(ED)RESIDUAL(-1)	-0.271778	0.175197	-1.551267	0.1298
D(LOG)(ES)RESIDUAL(-1)	-0.288952	0.177990	-1.623414	0.1135

Suggesting that there is indeed an Adjustment between the dependent variable, and other explanatory variables the coefficient of the Residual 0.616045 means that about 62% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. From the table of ECM model 1 and 11 below, we tested for each of the explanatory variables and dependent variable in order to properly explain the adjustment processes and corrects for any disequilibrium between the long –run and short- run relationship.

Error Correction Model for Model 1

Here Ut_{-1} is the lagged value of the error correction from the proceeding period. From the above regression result, the coefficient of residuals is negative which conforms to a priori expectation**.**

Suggesting that there is indeed an Adjustment between the dependent variable and other explanatory variables. For the variable labour(L) the coefficient of the 0.602705 means that about 60% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. For capita(k) the coefficient 0.308435 means that about 31% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. For electricity demand(ED) the coefficient 0.271778 means that about 27% 0f the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. For electricity supply(ES) the coefficient 0.271778 means that about 27% 0f the discrepancy between the long term and short term RGDP is corrected within a quarter or a year.

Error Correction Model Result For Model 11

ΔLOG(RGDP)=-0.008461+0.157522ΔLOG(K)-0.033410ΔLOG(L)+ 0.015032ΔLOG(EB) -0.632360 RESIDUAL -1 + e_t---------- (7)

t= (-0.551839)C (3.369347)K (0.899276)L (0.548686)EB (-3.448798)R

R^2 = 0.328253 D.W =2.129166

Where Ut_{-1} is the lagged value of the error correction from the proceeding period. From the above regression result, the coefficient of the residuals is negative which conforms to a priori expectation.

Suggesting that there is indeed an Adjustment between the dependent variable, and other explanatory variables the coefficient of the Residual - 0.632360 means that about 63% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. The t-statistics for the residual is -3.448798, therefore, is statistically significant.

Variables	coefficient	Standard error	t-statistics	P value
D(LOG(K(RESIDUAL(-1)	-0.602705	0.179897	-3.350280	0.0019
D(LOG(L)RESIDUAL (-1)	-0.308435	0.176517	-1.747387	0.0893
D(LOG)(EB)RESIDUAL(-1)	-0.281194	0.177794	-1.581571	0.1227

Error Correction Model Result for Model II

Here Ut_{-1} is the lagged value of the error correction from the proceeding period. From the above regression result, the coefficient of residuals is negative which conforms to a priori expectation**.**

Suggesting that there is indeed an Adjustment between the dependent variable, and other explanatory variable. For the variable labour(L) the coefficient of the 0.602705 means that about 60% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. For capital(K) the coefficient 0.308435 means that about 31% of the discrepancy between the long term and short term RGDP is corrected within a quarter or a year. For energy balance(EB) the coefficient 0.281194 means that about 28% 0f the discrepancy between the long term and short term RGDP is corrected within a quarter or a year.

Model 1. REGRESSION RESULT

Dependent variable: log (RGDP)

Variables	**Coefficient**	**Std Error**	**T- Statistics**	**Value**
C	13.46461	0.722370*	18.63950	0.0000
LOG (Ed)	-0.002088	0.150054*	-0.013912	0.9890
LOG (ES)	-0.154573	0.131964*	-1.171324	0.2496
LOG (K)	0.172789	0.013328*	12.96462	0.0000
LOG (L)	-0.064248	0.035312*	-1.819430	0.0777

R^2 = 0.914170 F-Statistic = 90.53318

R^2 = 0.904073 D- W statistics = 1.278667

Where* denote HAC standards error

We should note that in the above empirical results in order to correct the presence of autocorrelation and heteroscedasticity we make use of Newey-West HAC standard errors and covariance, we applied this procedure because the sample size is relatively large (39).

Evaluation Based on Econometric (A Priori Criteria)

In this section, we present the economic interpretation of the regression result and verify whether parameter estimate in each model conforms to a priori expectation.

Constant (c) = the constant measure the intercept of the regression result from the above empirical result, keeping all other variable constant (ED, ES, K, L) = 0 Real gross domestic product increases by the proportion of 13.46%.

Electricity Demand (ED):

The sign of its coefficient is negative, which does not conform to a priori expectation which postulates that the higher the demand for electricity, the higher the real gross domestic product. Since the coefficient appears negative, it means the demand of electricity is higher than the supply which certainly leads to imbalance experienced hitherto in the system. To this end, the decrease in power supply is the cause of the poor performance of the gross domestic product. The coefficient -0.002088 implies that over the study period, on average, a one percentage (1%) increase in the electricity demand leads to approximately about (0.002088 x 100) 0.21% decrease in real gross domestic product. This utterly is counterproductive and diabetic in guaranteeing industrial and unstable economic development, consequently plunging the economy into deficient "generator demand economy". Why the result is shamefully so is due the fact that the bulk of electricity consumed in Nigeria during the period under review (1970-2010) were not from public source, but privately generated through personal electric generating sets – "I better pass my neighbor generator economy".

Electricity Supply (ES)

The sign of the coefficient is negative which does not conform to a priori expectation since the higher the electricity supply the greater the output and that would lead to increase in the real gross domestic product. The coefficient -0.154574 shows that during the study period, a 1% increase in electricity supply leads to an average approximately about 15.46% (0.154573 x 100) decrease in real gross domestic product.

Capital (K)

The sign of the coefficient of capital is positive which conforms to a priori expectation. The higher the capital, the higher the output level and the higher the real gross domestic product, the coefficient 0.172789 means that over the sample period, a 1% increase in capital on average leads to approximately 17.28% (0.172789 x 100) increase in real gross domestic product.

Labour (L)

The sign of the coefficient of labour is negative which does not conform to a priori expectation because it is expected that the higher the labour, the higher the output (RGDP). The coefficient -0.064248 thus shows over the sample period, a 1% increase in labour on the average, will lead to approximately 6.42% decrease in Real Gross Domestic Product (RGDP).

Model II

Dependent Variable LOG(RGDP)Variables	Coefficient	STS. Error	TStatistic	Prob
C	11.50472	0.480203*	32.95803	0.0000
LOG (K)	0.152849	0.022095*	6.917842	0.0000
LOG (L)	-0.101415	0.039875*	-2.543032	0.0156
LOG (EB)	-0.060071	0.025706*	-2.336830	0.0253

R^2 = 0.899772 F = 104.7345
R^2 = 0.891181 D.W = 1.198399

Where* denotes HAC standard errors

Just like we applied in model 1, in order to correct the presence of autocorrelation and heteroscedasticity, we make use of Newey-West HAC standard errors and covariance, the essence of applying this procedure could be justified in the sense that the sample is relatively very large (39).

Constant (c):

The constant measures the intercept of the regression result, from the above empirical result, keeping all other variable, constant (K, L, EB) = 0, Real Gross Domestic Product increases by the proportion of 11.5%.

Constant (K):

The sign of the coefficient from the regression result is positive which conforms to a priori expectation. The coefficient value of 0.152849 means that over the sample period, a 1% increase in capital on average leads to approximately 15.28% (0.152849 x 100) increase in real gross domestic product.

Labour (L):

The sign of the coefficient of labour is negatively signed which does not conform to a priori expectation because, it is expected that the higher the labour, the higher the output (RGDP). The coefficient value of -0.101415 this shows over the sample period, a 1% increase in labour on the average will lead to approximately 10% decrease in RGDP.

Electricity Balance

The sign of the coefficient is negative thus showing that the demand for electricity is greater than the supply of electricity and this could cause disequilibrium in the system. The coefficient value of -0.060071 means that over the sample period, a 1% increase in electricity balance on the average will lead to approximately 6% decrease in RGDP.

Summary of the t-statistics: Model I

Variables	t-Statistics	Critical t	Decision	Conclusion
C	18.63950	2.042	/t/>t reject	Statistically significant
ED	-0.013912	2.042	/t/>t* do not reject H_o	Statistically insignificant
ES	-1.171324	2.042	/t/Lt* do not reject H_o	Statistically insignificant
K	12.96462	2.042	/t/>t* reject H_o	Statistically significant
L	-1.819430	2.042	/t/<t* do not reject H_o	Statistically insignificant

Summary of the t-Statistics For Model 11

Variables	t-Statistics	Critical t	Decision	Conclusion
C	32.95803	2.042	/t/>t reject	Statistically significant
K	6.917842	2.042	/t/>t* reject H_o	Statistically significant
L	-2.543032	2.042	/t/>t* reject H_o	Statistically significant
EB	-2.336830	2.042	/t/>t* reject H_o	Statistically significant

F-Test

This measures the overall significance of the regression model

F- Statistic = 90.53318 (For Model I)

F- Statistics=104.7345 (For Model II)

At a = 0.05 = n= 39 Fa (k-1, n-k) DF= F0.05 (4, 39) = 2.69 and F0.05 (3, 39) = 2.49 Since F-statistics = 90.53318 is greater than the critical F= 2.69, we thereby reject H_o and conclude that the model has a robust fit and is statistical significant. Alternatively it also means there exist a true relationship between the regressand and the regressor. In addition, the F-test in Model II is 104.7345, also greater than critical F= 2.49. The overall significance of Model II showed improved results, based on exclusion of Es and Ed. All the variables have an enormous influence on GDP.

Goodness of Fit Test (R^2)

R^2 (Coefficient of determination) measures the proportion of total variation of the regressand that is explained by the explanatory variables. The R^2 coefficient is 0.914170 while the adjusted R^2 = 0.904073 in model I and II has 0.899772 with adjusted R^2 of 0.891181. This implies that about 91% and 89% of the total variation in the Dependent Variable (RGDP) is explained by the explanatory variables in model I and model II respectively. In other to test whether this R^2 is statistically significant for the true goodness of fit in a model lets subject it to test. Observed R^2_1 = 0.914170 and R^2_2=0.899772; Critical R^2 = 0.097. Since observed R^2_1= 0.914170 and R^2_2=0.899772 are greater than critical R^2 = 0.097, we thereby reject H_o and concluded that the coefficient of determination R^2_1 and R^2_2 are statistically significant and a true goodness of fit for the models. The need for Unit Root and other econometrics test is due to Durbin-Watson statistics of 1.29 and 1.2, indicating the presence of serial correlation.

5. Conclusions

This paper examined the issue of energy balance to Nigeria Economic Growth with focus on the electricity Sector. The electricity sector has remained veritable sources of rapid economic growth and development of the economy. From the study, it is established that imbalance exist between electricity supply and demand. The electricity demand in excess of supply, evidenced by overstretched electricity demand in Nigeria is authenticated with the overall significance of model II that showed a robust fit. Capital investment exerted a positive and significant influence on the economy, this may not be far from the government effort to the sector.

However, the inverse relationship between labour and real Gross Domestic Product typified the laxity and complacency, complicated with mammon (god of money) worship, unbridled corruption influenza and quacks found in the power sector. The models variable, displayed short and long run equilibrium which portend that electricity supply, electricity demand, capital employed and electricity balance are important determinants of economic growth. It is quite obvious that the imbalance in the demand and supply of electricity is responsible for the stunted and the state of coma of electricity sectors that required multiple doctors. Electricity condition had had devastating and cancerous effects on the Nigerian economy.

6. Policy Implications and Recommendations

The policy implications and recommendations are based on the major findings of this study. They are as follows:

(i) This study shows that a wide gap exists between electricity demand and electricity supply in Nigeria. This suggests that policy makers should place much emphasis on ways to narrow this gap. This calls for adequate funding for investment in new power stations and, the maintenance and supply of infrastructure as well as the rehabilitation of existing power plants. Also, Nigeria has not explored the nuclear sources of power generation. This should be properly harnessed.

(ii) The study shows empirically that the electricity supplied does not transform to meaningful economic growth. This implies that electricity supplied does not lead to greater output thus, the decrease in real gross domestic product. The policy implication is that the power sector needs to be overhauled. Complete reformation of the power sector is paramount at this point.

(iii) The privatization move of the electricity sector by the government should be encouraged to allow for genuine independent power producers and private investors; The company should not be handed over to moneists, those who are in business because they are business (political quasi-businessmen) but to paternistic corporate capitalists which primary aims is skewed or centred on satisficing or social responsibility.

(iv) The license tenor of 10years that does not give sufficient time for an investor to recoup his investment, should be stamped out by the government. These will help to reduce the inefficiency and corruption in the sector thereby transforming better performance. In addition, incentive based regulatory regime using weighted average tariff via Multi-Year Tariff Order (MYTO) and Sales Agreement should be pushed rigorously. This tariff takes account of fuel subsidies to power station operators. The review of it should be in such way as to attract private investors.

(v) The issue of vandalism and theft of power apparatus should be checked, because this causes unnecessary disturbances in power transmission.

(vi) Drastic reduction of high technical and non-technical losses, transmission losses, poor voltage stability due to poor planning and apropos maintenance regime are required to heal the distressed electricity condition in Nigeria.

(vii) This study also shows that capital investment has a positive influence on Real Gross Domestic Product. This implies that attempt to reduce capital in this sector, has adverse effect on real gross domestic product.

(viii) Drive for domestic use of gas, putting on ground all the processing capacity and transportation of infrastructure that would supply gas to all available gas fired station.

(ix) Widening Prepayment Meter Installation-GSM approach; the distribution companies will make notable progress in revenue collection efficiency. On the other hand, the tricks and undue extortion, gnashed with shameless corrupt practice, unethically performed by staff will be eradicated, given room for proper utilization, distribution and consumption of electricity in Nigeria.

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