Economic Consequences of Electricity Crisis on Manufacturing Output in Nigeria

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Abstract
This study focused on economic consequences of electricity crisis on manufacturing productivity in Nigeria The National Bureau of Statistics and the CBN statistics bulletin were utilized to provide aggregate time series data for the years 1986 to 2021. Using the Johansen co-integration and error correction mechanism method, the data was examined. Johansen co-integration analysis showed that there is a long-term relationship between electricity crisis variables such as Electricity Distribution Loss, Cost of Maintaining Alternative Source of Electricity, Capacity Utilization, Government Expenditure on Electricity and Exchange Rate while short-term results from the Error Correction Model showed that electricity crisis has a significant negative impact on economic growth. In accordance with the findings the following recommendations were made; government should show serious commitment and spend sufficiently but honestly on electricity sub-sector for its regular and efficient distribution to ensure periodic replacement of worn out and damaged equipment in order to reduce electricity loss especially to manufacturing sector in Nigeria. Government must ensure adequate investment on related capital projects, ensure maximal capacity utilization. policy on energy should guarantee that electricity creates less negative effects on manufacturing performance.

Keywords: *Electricity Distribution Loss, Capacity Utilization, Government Expenditure on Electricity, Cost of Maintaining Alternative Source of Electricity, Exchange rate.*

Introduction

According to Ekpo (2009), Nigeria is operating a generator economy with bad effects on cost of production. Electricity crisis, including electricity blackouts and persistent reliance on self-generating electricity, is detrimental to the growth of the manufacturing sector. The Nigerian Electricity Power Authority (NEPA), currently known as Power Holding Company of Nigeria (PHCN), continues to experience difficulties with its inconsistent power supply, which has a negative impact on the manufacturing sector's ability to compete globally (Onugu, 2005; Aremu and Adeyemi, 2011). By way of responding to this discovery, successive Nigerian administrations have been devoting tremendous amount of resources into the electrical sub-sector, although it appears that, this has not convert to a proportionate higher productivity of manufacturing sector in the country.

Subair and Oke (2008) acknowledged that the availability of electricity, which is mostly used to power equipment used in the manufacture of various goods, is a crucial catalyst for the manufacturing sector's productivity and, as a result, for the growth of the economy. Due to the high costs of fuel and maintenance, not all industrial companies would be able to operate profitably on power producing units in a fiercely competitive and open economy like Nigeria. In most cases, the power generating units that are now the main source of electricity supply for enterprises that could afford them should act as backups or standby in the event that government supplies are interrupted (Okereke, 2010). However, due to government ineptitude, backups are currently acting as the main system.

Nigeria has had issues with power generation, transmission, and distribution for more than 20 years. The fact that Nigeria is the world's biggest buyer of standby electricity producing plants highlights the depth of this. (2010) Braimoh and Okedeyi. The Nigerian Federal Government should mobilize resources and concentrate more on resolving the issue of electricity that causes the purchase of generators.

Fundamentally, the power sector of the economy, a part of which is the electrical sector, is very important to our lives and plays a crucial role in the process of economic transformation. In Finland, the current megawatts is expected to be over 36,000 megawatts, producing electricity for 5.5 million people, while the present power generation capacity in Nigeria is considered to be around 6,000 megawatts, with an average operational capacity of 2,000 megawatts. Due to this issue, the Nigerian Energy Sector has struggled for the past 20 years to create, transmit, and distribute power to the Nigerian populace at a level that meets the necessary standards.

Rostow (1960) emphasizes the rise of the manufacturing sectors as a leading sector that will result in a high growth rate in the economy as a result in his stages of growth theory. In this sense, the manufacturing sector's importance cannot be overstated, according to (Kniivila, 2008), which argues that it is one of the factors that contributes to some developing nations' strong economic growth, particularly the Asian Tigers Taiwan, Korea, Malaysia, and Indonesia. These countries have achieved this, based on the strong power sector that support the vibrant manufacturing sector, thereby making it capable to generate employment opportunity, reduce poverty and help these nations to possess high growth statistics (Ellahi, 2011).

The sector has also drawn attention since it has the potential to boost exportable commodities production, balance the books, and promote import substitution (Saeed and Waters, 2002)

The study will thus make a significant contribution to the field of energy economics because most previous research on the relationship between energy and economic growth has concentrated primarily on total GDP. Additionally, it is necessary to look into the economic effects of the electricity crisis on the output of the manufacturing sector separately because rising manufacturing sector productivity will result in higher economic growth overall. As a result, the rest of this essay is structured as follows: While the methods of data analysis are covered in Section 3, Section 2 offers a succinct survey of the literature. Finally, Section five discloses the results and wraps up the study. Section four presents the empirical results estimations for the research.

2.1 Theoretical Literature

Traditional Theory of Cost.

The ideal level of output can only be reached at one output level before costs start to increase, according to the conventional theory of cost. As a result, the output capacity is completely utilized when the marginal cost curve crosses the average cost curve at its lowest point and the latter begins to rise. Because facilities with different levels of productivity are not built by businesses according to the old notion of costs, surplus capacity is a common occurrence for businesses. According to Bannock (1998), excess capacity is defined as the difference between the volume produced by a firm or set of firms and the volume they might most effectively produce. For instance, if a company manufactures 1,000 vehicles at a cost of N5,000 each, the output with the lowest cost would be 1,300 cars at a cost of N4,000 each. 300 automobiles are therefore available in excess.

According to Bannock et al. (1998), sustained excess capacity is a characteristic of businesses operating in monopolistic competition as opposed to perfect competition, where it will only exist in the short term. . When resources are idle, excess capacity can also refer to the discrepancy between the actual and maximum output of a company, sector, or economy. The modern theory of cost, on the other hand, made the assumption in its own description that businesses build their plants with some flexibility in their productive capacity, allowing such businesses to have reserve capacity. Additionally, the theory states that businesses are considered efficient when they use between two-thirds and three-quarters of the available power. According to the reserve capacity of the contemporary theory of costs, some outputs can be generated for a single cost. Regardless of the stances or arguments put forth by each of the theories examined in this study, they are not intended to permanently close the gap between the rise of manufacturing productivity, particularly in Nigeria, and the availability of power. To ensure the best possible use of the machinery in the nation's manufacturing sector, the electricity sector should undergo a complete revolution and renovation. For instance, insufficient power supply forces Nigerian manufacturing industries to use power generators, and the expense of maintaining them increases production costs by adding to the cost of fuel.

2.2. Empirical Literature

The Granger causality and error correction method (ECM) were applied in a study of Malawi by Jumbe (2004), and it was shown that there was a bi-directional causal relationship between GDP and electricity consumption. A permanent increase in GDP may result in a permanent increase in electricity consumption, according to the results of the error correction models, and in order to continue this growth, the government should promote high investment possibilities in the power sector to meet economic needs.

Additionally, Riker (2012) used time series data between 2002 and 2006 to apply price elasticity theory to investigate the effect of energy price on non-petroleum industrial exports in the USA. The outcome showed that the energy sector's prices have a big impact on American manufacturing. The reviewed periods had a reduction of $11.5 billion annually. The report recommended subsidies for industrial energy use as well as the expansion of the national energy resource, both of which will have an impact on the costs of industrial energy.

Additionally, Nyansu (2016) found that the frequent power outages had compelled businesses to adopt alternative methods of power generation in order to deal with the inadequate public supply of electricity needed to run their operations. This research used the Ordinary Least Square (OLS) method and chi square to investigate the effective power supply to industries in Ghana. Nyansu (2016) goes on to say that this has resulted in higher prices for goods and services as well as a loss of income. He argues that the government should take all appropriate action to ensure that the industrial sector receives adequate electricity supply. In Nigeria, several studies on the issue of inadequate energy supply have been conducted. For example.

(Edet, 2016) claim that manufacturing businesses are only supported when there is a steady supply of energy, using the modern economic approach of error correction mechanism (ECM) to analyze the growth of the electricity supply in Nigeria. He adds that frequent blackouts might eventually put a stop to these industries, and that an ineffective power supply would result in the slow expansion of the country. having a similar viewpoint.

(Ologundudu, 2014) asserts that the supply of electricity in Nigeria is plagued by a constant crisis as evidenced by such indicators as electricity blackouts and persistence on self-generating electricity in his research to test empirically the causal and long run relationship between economic development, industrialization, and electricity supply using the auto-regressive distributed lag (ARDL) bounds test approach to co-integration. The causation conclusion demonstrated very clearly the importance of energy supply in promoting economic growth and development. He maintains that in order to meet the numerous consumers' needs for better service, PHCN must upgrade its equipment.

Similarly, (Ogbuagu, 2010) used descriptive and ordinary least squares analysis to analyze the factors influencing Nigeria's electricity supply and capacity utilization and found that an epileptic power supply has a dampening effect on the industrial sector's efficiency. To strengthen the nation's electricity supply, they recommended that the government encourage more private engagement. In a similar vein, (Usman, 2013) stressed that for rapid growth and development, the frequent power outages experienced must be reduced to a bare minimum due to the pressure they place on the manufacturing sector. They did this by using the fuzzy entropy method and evaluation based on weighted rank average. He explains that the majority of enterprises must find alternate sources of energy, raising their production overhead costs and, consequently, raising the price of goods and services, which does not encourage economic growth and development.

Olayemi (2012) studied the effects of Nigeria's electricity crisis on manufacturing sector productivity using time series data from 1980 to 2008 and both traditional and modern theories of cost. The result of using multiple regressions demonstrates that the supply and generation of electricity have a negative impact on the expansion of manufacturing sector productivity.

Government spending on unproductive sectors is to blame for the weak performance of the power sector. The study supported the independent power project that some states in Nigeria had proposed. The main suggestion is that the electricity issue be resolved in order to enhance industrial expansion.

Using time series data from 1981 to 2009, Mojekwu and Iwuji (2012) examined the effects of the electricity supply and macroeconomic factors on the performance of the manufacturing sector in Nigeria. The results of the multiple regression analysis (MRA) revealed that power supply has a considerable positive impact on capacity utilization in Nigeria, whereas interest rate and inflation rate had a negative impact. The capacity utilization has changed as a result of the predictor variables, as indicated by the R2 of 88.54 percent. It was suggested that the government fully implement the ongoing power reform initiative of privatizing the sector while maintaining a lending and inflation rate in the single digits.

Ndebbio (2006) suggested that the supply of power drives the process of industrialization. He emphasized that the amount of power consumed per megawatt is a key determinant of whether a nation is industrialized or not. He added that a country's level of industrialization is proportionate to its per-capita power consumption, expressed in kilowatt hours (KWH).

Adenikinju (2005) also examined the financial impact of Nigeria's power disruptions. applying the revealed preference method to data from business survey. According to Adekininju, the marginal cost of power outages ranges from $0.94 to $3.13 per kWh of lost electricity. Given Nigeria's inadequate electricity infrastructure, (Adenikinju, 2005) came to the conclusion that business losses from power outages were substantial. The failures of the infrastructure were determined to have the greatest impact on small-scale enterprises.

According to Ukpong (1976), there is a strong correlation between electricity use and economic growth. Additionally, he argued that a key aspect in boosting the growth of the industrial sector is the expansion of the energy sector on the demand side. An earlier research on the costs of power interruptions to Nigeria's industrial and commercial sector was conducted by Ukpong in 1973. He evaluated the cost of power outages between 1965 and 1966 with a few chosen businesses using the production function approach. He calculated that there was 130Kwh and 172Kwh of unsupplied electrical energy between the dates. According to estimates, the two years of the power outage cost the industrial sector N1.68 million and N2.75 million, respectively. According to Ukpong, unsupplied electrical energy has a detrimental effect on Nigeria's industry productivity growth.

Methodology

The World Bank's Global Development Indicators and the Central Bank of Nigeria's Statistics Bulletins provided the secondary data for this research project, which uses annual time series data on the Nigerian economy for analysis. The study's time frame was from 1986 until 2022.

Model Specification

According to the regression model chosen for this study, the index of manufacturing production in percentage (IMP) has been influenced by government capital expenditure (GCE), capacity utilization in percentage (CPU), electricity distribution loss measured in percentages (EDL), and exchange rate (EXR) for the time period specified. The model used in this work was inspired by earlier research (Enang, 2010; Ndebbio, 2006), although with a few changes.

The premise of this study's model is drawn from the reviewed work of Ndebbio (2006), which asserts that an adequate and consistent supply of power promotes industrialization. The work further expresses manufacturing productivity index as a function of megawatt of electricity generated or supplied, i.e. MPI = f (EGI). Therefore, from the existing model of Ndebbio (2006), the study specifies the following model;

$$MPI = \alpha 0 + \beta_1 EDL + \beta_2 CPU + \beta_3 GEE + \beta_4 EXR + \beta_5 CAS + Ui$$

Where;

MPI = Manufacturing productivity index;

EDL = Electricity distribution loss;

CPU = Capacity Utilization;

GEE = Government Expenditure on Electricity;

CAS = Cost of Maintaining Alternative Source of Electricity

EXR = Exchange rate;

Ui = Stochastic error term In estimating the parameters of the model, ordinary least squares (OLS) multiple regression technique was employed. The data for all the variables stated in the model were extracted from various editions of Central Bank of Nigeria Statistical Bulletin over the period of 37 years

4 RESULTS AND DISCUSSION OF FINDINGS

4.1 Unit Roots Outputs

Since the study used time series data, the unit root test was performed using the ADF approach in order to determine whether the variables were stationary or not.

Table 4: Summary of ADF Unit Root Test with trend and intercept

Variable	ADF test statistics	Mackinon Critical value @ 5%	No of time difference	Remark
LN MPI	-4.031607	- 3.885964	I (1)	Stationary
LN EDL	-7.649831	-3.865132	I (1)	Stationary
LN CPU	-6.224221	-3.865132	I (1)	Stationary
LN GEE	-6.359154	-3.871522	I (1)	Stationary
LNCAS	-5.754389	-3.865132	I(1)	Stationary
LNEXR	-7.174511	-3.871522	I(1)	Stationary

Source: Computed by the Authors

The variables used in the study, including Manufacturing Productivity Index, Electricity Distribution Loss, Capacity Utilization, Government Expenditure on Electricity, and Cost of Maintaining Alternative Source of Electricity Exchange Rate, are integrated of the same order of I (1), respectively, according to the results of the unit root test shown above. This indicates that the variables are stationary at their respective first difference.

4.2 **Co-integration Test Results**

After confirming the stationarity of the variables, we ascertain whether the model's variables have a long-term equilibrium connection. This study uses Johansen Co-integration techniques to carry it out. The results are presented below:

Table 5: Johansen Co-Integration Test.(Trace Statistics)

Hypothesized number of (ECS)	Eigen value	Trace statistics or likelihood ratio	5% critical value	Prob**
None*	0.717863	73.15596	58.96724	0.0092
At most 1*	0.571878	42.35659	38.88618	0.0265
At most 2	0.332488	21.96316	26.58562	0.3317
At most 3	0.186697	3.685765	4.952577	0.2100

Source: Computed by the Authors

From Table 5 above there exist a long run equilibrium relationship in the model. The trace statistics shows that there are 2 Co-integration equations among series since the likelihood ratio (73.15596) is greater than 5 percent critical value (58.96724) at None hypothesised No of Ecs (None*) and (42.35659) is greater than (38.88618) at 5% critical value.

Table 6: Johansen Co-Integration Test (Maximum EigenStatistics)

Hypothesized No of Ecs	Ergen **Value**	Max Eigen Statistics	5% Critical Value	Prob**
None*	0.717863	41.88848	38.69540	0.0069
At most 1	0.571878	31.48453	32.24273	0.0952
At most 2	0.332488	9.369488	25.37571	0.4003
At most 3	0.186697	3.684766	4.952577	0.2099

Source: **Computed by the Authors**

From Table 6 above, it shows that there exist a long run equilibrium relationship in the model using the Maximum Eigen statistics (41.88848) which is greater than 5 Percent critical Value (38.69540) at None hypothesized No of ECS (None*). All the variables therefore stand significant. Having established the long run relationship among the variables in the model, we switch to the short run Error Correction Model

Table7: **Long Run Results**

Variable	Coefficient	Std. Error	t statistics	Probability
C	-3.258927	0.810762	-1.048228.	0.0387
LNEDL	-0.078253	0.026044	-0.540443	0.0331
LNCPU	0.043006	0.276201	1.868441	0.0094
LNGEE	0.034144	0.218608	2.060120	0.0058
LNCAS	-2.710087	2.720985	1.005633	0.0612
LNEXR	-0.472901	1.398100	-0.397211	0.1031

Source**: Computed** by **the Authors**

From table 7 above, the results of the long-run shows that EDL, CAS and EXR is inversely related to Manufacturing Productivity Index which conforms to the a priori prediction. However, CPU and GEE exhibit direct relationship conforming to the a priori expectation. In addition, the values of the EDL, CPU and GEE are statistically significant at the 5 per cent level.

4.3 Error Correction Model (ECM)

The error correction model gauges how quickly equilibrium is reached. If the coefficient value of the Error Correction Model (ECM) is negatively signed and the p-value is found to be 0.05, the result is statistically significant and follows the criterion. The results show that the dependent variable's present value will roughly return to long-run equilibrium in the independent variable at a speed of 34%. A higher percentage of ECM denotes feedback from the previous period's disequilibrium between the present level of the dependent variable and the present and past levels of the independent variables, or an adjustment of that value. The lagged value of each variable is used to over-parameterize the ECM, while the sparing ECM takes into account the variables that quickly reach equilibrium with the lagged variables. The results of both over parameterized and sparse ECM on the given parameters are displayed in tables 7 and 8 below.

Table 8: Over-parameterized ECM

Variable	Coefficient	Std. Error	t statistics	Probability
C	0.103807	0.164001	0.670082	0.3343
D(LNEDL)	-0.273718	0.108051	-1.802020	0.0616
D(LNCPU)	0.200165	0.154447	1.020627	0.1628
D(LNGEE)	0.060070	0.110120	0.662654	0.3386
D(LNCAS)	0.472307	0.240158	0.209160	0.1204
D(LNEXR)	0.016732	0.138003	0.107256	0.0034
D(LNEDL(-1))	0.104576	0.075601	1.044137	0.1530
D(LNCPU (-1))	0.044322	0.174188	0.107833	0.7260
D(LNGEE(-1))	-0.087170	0.158730	-0.253106	0.6101
D(LNCAS(-1))	0.031640	0.094512	0.104204	0.0172
D(LNEXR(-1))	0.146520	0.301165	0.063490	0.0482
D(LNEDL(-2))	-0.010041	0.073544	-0.005436	0.8000

D(LNCPU(-2))	0.100427	-0.447291	0.062143	0.1420
D(LNGEE(-2))	0.060219	0.527100	0.582430	0.5421
D(LNCAS(-2))	0.104533	0.682201	0.012741	0.2101
D(LNEXR(-2))	0.300453	0.300170	0.184320	0.0271
D(LNEDL (-3)	-0.067167	0.127226	-0.637008	0.3536
D(LNCPU(-3))	0.066633	0.160003	0.544740	0.4106
D(LNGEE(-3))	-0.62412	0.083227	-0.267215	0.6088
D(LNCAS(-3))	0,167044	0.138530	1.002712	0.1708
D(LNEXR(-3)	-0.051457	0.108277	-0.665287	0.3371
(ECM(-1)	-0.050770	0.035228	-0.305017	0.5715

Source; Computed by the Authors

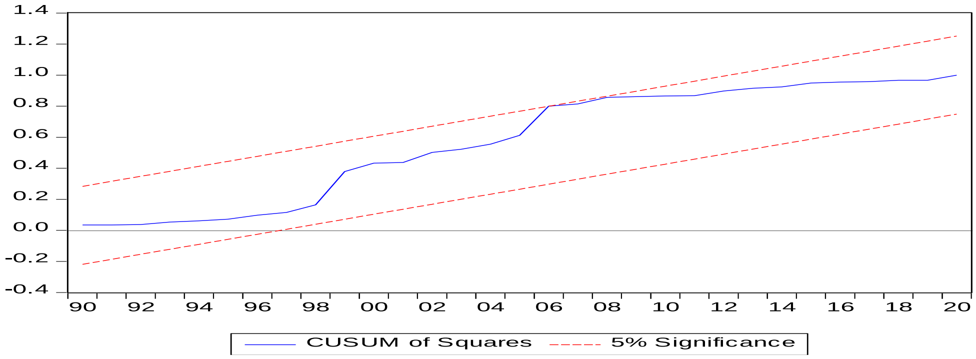
Table 9: Parsimonious ECM

Variables	Coefficient	Std Error	T. Statistics	Probability
C	0.124888	0.158631	0.763807	0.2780
D(LNEDL)	0.401706	0.107457	1.235143	0.0152
D(LNCPU(-1))	0.082616	0.081163	0.006446	0.2112
D(LNGEE(-1))	-0.100512	0.075677	-0.021870	0.1557
D(LNCAS(-1))	0.437210	0.614380	0.053294	0.0298
D(LNEXR(-1))	-0.044780	0.291104	0.067210	0.4821
ECM (-1)	-0.475041	0.015055	-1.554577	0.0015

Source: Computed by the Authors

The results of the over-parameterized and frugal analyses are displayed in tables 8 and 9 above. Tables 7 and 8's negative ECM values show that the ECM is appropriately signed and statistically significant at the 0.05 percent level. This suggests that in order to establish a causal relationship between the past level of MPI and the present and previous levels of EDL, CPU, GEE, CAS, and EXR, the present value of 0.475041 has a feedback of approximately 47.5% from the previous period of disequilibrium to the present level of MPI.

Figure 1: The Stability Tests



The result of CUSUM test above obtained from the model showed that there is evidence of stability in the coefficient at 5% level of significance in CUSUM Test since the cumulative Sum is located inside the area between the two critical lines.

Discussion of Finding

The outcome of our research shows a long-term inverse relationship between Manufacturing Productivity Index, Electricity Distribution Loss, Cost of Maintaining Alternative Source of Electricity and Exchange Rate with a short-term positive relationship. This result is in line with the work of Ologundudu 2014, which examined the causal and long run relationship between economic development, industrialization, and electricity supply and found the same result. This is in line with the a priori expectation of a negative relationship between Manufacturing Productivity Index, Electricity Distribution Loss, Cost of Maintaining Alternative Source of Electricity and Exchange Rate The long-run and short-run estimates show that there is a positive relationship between Capacity Utilization and Government Expenditure on Electricity which is consistent with the expected prediction. This result is consistent with those of Nyanso 2014 who looked into the same issue.

5. **Conclusion and Policy Recommendations.**

This study focused on economic consequences of electricity crisis on manufacturing productivity in Nigeria The National Bureau of Statistics and the CBN statistics bulletin were utilized to provide aggregate time series data for the years 1986 to 2021. Using the Johansen co-integration and error correction mechanism method, the data was examined. Johansen co-integration analysis showed that there is a long-term relationship between electricity crisis variables such as Electricity Distribution Loss, Cost of Maintaining Alternative Source of Electricity, Capacity Utilization, Government Expenditure on Electricity and Exchange Rate while short-term results from the Error Correction Model showed that electricity crisis has a significant negative impact on economic growth. The analysis came to the conclusion that the Power Holding Company of Nigeria (PHCN) has not been efficient enough at sustaining electricity generation to industrial sector. The much proclaimed target of 12,000 Megawatts of electricity that could have been achieved in 2021 has remained a misery, thereby impacting negatively on manufacturing growth. In accordance with the findings the following recommendations were made; government should show serious commitment and spend sufficiently but judiciously on electricity sub-sector for its regular and efficient distribution to ensure periodic replacement of worn out and damaged equipment in order to reduce electricity loss especially to manufacturing sector in Nigeria. Government must ensure adequate investment on related capital projects, ensure maximal capacity utilization. policy on energy should guarantee that electricity creates less negative effects on manufacturing performance. There is need for government to reduce its budgetary allocation to recurrent expenditure on the electricity sector and place more emphasis on capital expenditure so as to accelerate economic growth in Nigeria through the manufacturing sector output. Government must endeavor to keep the exchange rate stable in order to discourage fluctuations that may affect prices of equipment, spare parts and raw materials.

References

Adenikiuju, A. (2005); Analysis of the cost of infrastructure failure in a developing economies. The case of electricity sector in Nigeria. African Economic Research Consortium.

Aremu, M.A. And adeyemi, S.L. (2011). Small and Medium Scale Enterprises as a Survival Strategy for Employment Generation in Nigeria. *Journal of Sustainable Development*, 4(1), 200 – 206

Bennok, G (1998); Penguin Dictionary of Economics, 6th Edition, New York. Penguin Putnam, Inc.

Braimoh and Okedeyi (July 2010): Energy and Power Generation, Transmission and Distribution in Lagos state. Retrieved September 12, 2011, from http://cefolassaocoed.net/index.php?option=com_content&view=article&id=83&Itemid=88&limitstart=

Ekpo, A.H. (2009); The Global Economic Crisis and the crisis in the Nigeria Economy. Presidential Address at the 5th Conference of the Nigerian Economic Society, Abuja, Nigeria.

Iwayemi, A. (1998); Energy Sector Development in Africa. A Background Paper prepared for the African Development Bank (ADB).

Jumbe, O. (2004). Co-integration and causality between electricity consumption and gdp: Empirical evidence from Malawi. Energy Economics, 26(1): 61-68.

Kniivila, M. (2008). Industrial development and economic growth: implication for poverty reduction and inequality. UN publications for Industrial Development

Lee, K.S. and Anas, A. (1992); Impacts of infrastructure deficiencies on Nigerian Manufacturing: Private alternatives and policy options. Infrastructure and Urban Development Department. (IUDD)

Ndebbio, J.E.U. (2006); The structural Economic dimensions of Underdevelopment; Associated vicissitudes and imperatives: Agenda for positive change. 33rd Inaugural Lecture, University of Calabar, Nigeria.

Odell, P.R. (1995); The Demand for energy in developing region: A case study of the Upper Ancavalley in Columbia. Journal of Development Studies, Vol. 3, Pp 234-254.

Ogbuagu, U., Ubi, P. and Effiom, L. (2010). The structure of electricity supply in Nigeria. The Leajon. *Academic Journal of Interdisciplinary Studies*, 2(1): 42-48..

Okereke, O.C. (2010). An Analysis of the Failure of the National Power Project for the Supply of 6000mw in December 2009, Report on Projects & Project Management in Nigeria, PM World Today, vol. Xii, Issue I, Retrieved from http://www.pmforum.org/library/regionalreports/2010/pdfs/jan/rr-nigeria.pdf

Olayemi, S. O. (2012). Electricity Crisis and Manufacturing Productivity in Nigeria (1980-2008), Developing Country Studies, Vol 2, No.4 Retrieved from htt://www.iiste.orgISSN 2224-607X (Paper) ISSN 2225-0565 [15].

Ologundudu, M. M. (2014). The Epileptic nature of Electricity supply and its consequences on industrial and economic performance in Nigeria. Global Journal of Researches in Engineering, 14(4): Available: https://globaljournals.org/item/4116-the-epileptic-nature-of-electricity-supply-and-its-consequences-onindustrial-and-economic-performance-in-nigeriaerror-correction-modelapproach

Onogu, B, A, N. (2005). Small and Medium Enterprises (SMES) in Nigeria: Problems and Prospects, Being a Dissertation Submitted to the St. Clements University in Partial Fulfillment of the Requirements for the Award of the Degree of Doctor of Philosophy in Management, http://www.stclements.edu/grad/gradonug.pdf

Premium Times Nigeria (2015). Retrieved from http://www.premiumtimesng.com/business/165956-nigerian-govt-moves-to-realise6000-mw-electricity-supply-target.htm/.

Riker, D. (2012). Energy costs and export performance. Manufacturing and services economics brief no.7, office of competition and economic analysis of the international trade administration's manufacturing and services unit. Available: www.trade.gov/mas/ian

Rostow, W. W. (1960). The five stages of growth-a summary. The stages of economic growth: A non-communist manifesto. Cambridge University Press: Cambridge. 4–16.

Subair, k. And Oke, M.D. (2008). Privatization and Trends of Aggregate Consumption of Electricity in Nigeria: an Empirical Analysis. *African Journal of Accounting, Economics, Finance and Banking Research* 3(3), 18 – 27 [18].

Uchendu, O.A. (1993); The economic cost of electricity outages: Evidence from a sample study of Industrial and commercial firms in Lagos, Nigeria. *Nigerian Journal of Economics and Social Studies.* Vol. 1, Pp 50-81.

Ukpong, I.I. (1973); The economic consequences of electric power failures. *The Nigerian Journal of Economic and Social Studies.* Vol. 2, Pp 90-120.

World Bank, (1993b); Energy Sector Management: Assistance Programme Report on Nigeria (APR) working paper.