

Impact of deficient electricity supply on the operations of small scale businesses in North East Nigeria

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Key Words

Small Scale Businesses, Deficient Electricity, Private Provision, Economic Development, North East Nigeria

Abstract

Electricity supply in Nigeria has been erratic. Consumers of electricity (residential, commercial and industrial consumers) suffer untold hardship as the State Owned Enterprise; the Power Holding Company of Nigeria (PHCN) has been unable to supply reliable power. This is despite massive injections of funds by the Federal Government into the operations of the company over the years. The failure has significantly impacted negatively on the operations of the business sector especially the small scale subsector that operates with little capital and are thus in most cases unable to afford a back-up facility to ensure un-interrupted power supply for their operations. The study examined the impact of deficient electric power supply on the operations of small scale businesses operating in north east of Nigeria. From the population of small scale businesses, a sample was selected through the use of stratified random sampling to ensure the effective representation of the population of small scale businesses in north east Nigeria. Result from data analysis indicates the severity of electricity supply outages and the costs imposed by power supply outages on the operation of this class of businesses in the region. The paper therefore recommends the need for policy attention towards revitalizing the electricity sector of Nigeria for enhanced supply of electricity to the national economy. When this is achieved, the small business sub-sector will be in a position to effectively lead in the drive towards industrializing the Nigerian economy.

1.0. Introduction

Nigeria is hugely endowed with energy resources that include oil, natural gas, coal, biomass, solar, wind and hydro resources among others (Iwayemi, 2008; Onuaha, 2010). However despite this huge endowment Nigeria is also an energy deficient country whose economy suffers tremendously from the shortage of energy supply (Iwayemi, 2008). The shortage imposes huge cost on the economy and compels widespread private provision by different classes of energy users (Lee and Anas, 1998; Adenikinju, 2005). Additionally Nigerians often spend many productive hours queuing for petroleum products in the fuelling stations to buy fuel at government regulated prices because fuel supply scarcity has been a recurrent feature of the Nigerian energy market. Fuel scarcity in the economy and failing electricity supply create dual energy crisis for Nigeria (Iwayemi, 2008). Investment in back up generating facility is widespread and imposes significant costs on the economy. Small Scale businesses suffer the most from Nigeria's energy poverty as they spend a large proportion of their capital (about 20-25% of their investment) on back up generating facilities (Lee and Anas, 1991; Foster and Steinbuks, 2008). In fact Iwayemi, (2008) links most of the country's economic woes including its inability to industrialize to the dismal performance of the energy sector. However power supply outages are not peculiar to developing countries considering the recent black outs in California and other parts of north eastern United States of America. Though it has been the cardinal policy of government electricity policy and consumers desire to have power supply reliability, *keeping the light on* is an extremely difficult challenge (DOE, 2003) especially in a developing economy.

Ukpong, (1973);Iyanda, (1982); Lee and Anas, (1991, 1992); Uchendu, (1993); Ajayi (1995), Adenikinju, (2005); Oseni and Pollit, (2013) have examined the cost of power outages and unreliable supply of electricity on the firms and they document firms survival strategies in Nigeria and Africa. This study builds on the previous studies by focusing on the small scale businesses in the North East Nigeria for many reasons. First the small scale businesses have a lot of contribution to make towards the development of the Nigerian economy in terms of providing employment and income opportunities for the people. Based on experience, these types of businesses provide the surest path to industrialization. Additionally the choice of small scale business is informed by the fact they are the dominant businesses found in the North East region of Nigeria. Like all parts of Nigeria the North East region also suffers from epileptic supply of electricity. The study is expected to bring to the fore the challenges small scale businesses face due to unreliable supply of electricity in the region and highlight on the investment potentials for electricity generation, transmission and distribution infrastructure that the private sector could take opportunity of in closing the deficit. This is especially important considering the recent introduction of electricity market reform.

The objective of the study is;

To determine the impact of deficient electricity supply on the operational performance of small scale businesses in north east Nigeria.

Consequently the research intends to test the hypothesis that

Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in the north east Nigeria.

The rest of the paper is organised as follows: section two presents the literature review and the methodology to be used in the conduct of the study. Data analysis and hypothesis testing are performed in section four while section five presents the concluding parts of the study.

2.0 Conceptual and Empirical Discussions

2.1 The State of Power Supply in Nigeria

The dismal performance of the Nigerian electricity supply industry is well noted (Adenikinju, 2005; Iwayemi, 2008; FGN, 2008; FGN, 2010 among others). Nigeria's quests for industrialization have been hampered by erratic and inadequate electric power supply (Olugbenga, Jumah and Phillips, 2013). This is largely due to inadequate generation, transmission and distribution infrastructure. Though a lot of resources have been expended to expand the industry's infrastructure (the amount spent from 1999 to 2004 was higher than that spent on the power sector between 1981 to 1998), Nigerians still experience inadequate and unreliable electric power supply characterised by high voltage variation recurrent black outs and brown outs and pervasive reliance on self generated electricity (Iwayemi, 2008). Because of the pervasive dependence of the electricity consumers on generators, the Nigerian economy is being described as a *generator economy* (Ekpo, 2009) exemplified by high operational costs and poor competitiveness. Thus Nigeria's persistent electricity crises have hampered the industrialization process of the country due to largely to production stoppages and high operational cost. These have undoubtedly significantly undermined the growth and development process of the economy (Udah, 2010). The huge transmission and distribution losses and low capacity utilization (about 40%) in the industry define the dismal performance of the electricity sector as indicated in the diagram below

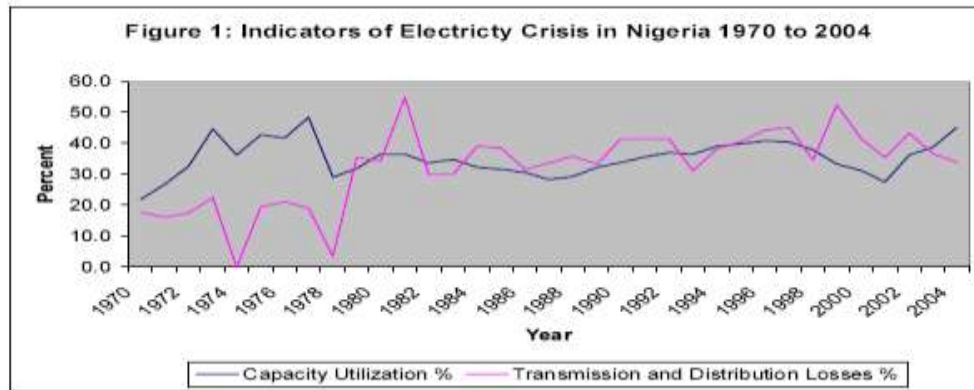


Figure 1: Indicators of Electricity Crisis in Nigeria 1970-2004

Source: PHCN and NEPA as cited in Iwayemi, (2008)

Consequently power outages have become the norm in Nigeria. In fact in 2004, major manufacturing firms experienced 316 outages. This increased by 26% in 2005 followed by an explosive 43% increase between 2006 and 2007 (Iwayemi, 2008). Due to the incessant power supply challenges, government in 2005 promulgated reform of the industry by opening the sector for private investment especially in the generation segment of the market (FGN, 2010). The reform has however failed to enhance the quantum and reliability of power supply in Nigeria. The result is the frequent power supply failure that has made electric power supply to be very unreliable and inadequate

Electricity supply reliability has become an important public policy issue due to the enormous costs being born by electricity users due to unreliable and inadequate electric power supply. Ensuring electricity supply reliability has also occupied important space in private investment and operating decisions (DOE, (2003). Consumers of electricity require infrequent occurrence of outages or other power supply disturbances which usually interfere with their use of electrical appliances (for domestic consumers) or halt their production or operational activities. Even at macro level, unreliable power system poses serious challenges to the socio-economic and political structure of an economy. Some of these challenges manifest in the loss of welfare, pressure on governance, and loss of output among others (Oseni and Pollit, 2013). Poor electricity supply in Nigeria and indeed the rest of Africa has posed the greatest challenge to productivity, investment growth and competitiveness (Renneika and Svenson, 2002; ADB, 2009). For example an average firm in Nigeria in 2007 experienced and outage of 8.2hours, 26.3 times in a typical month translating into about 216 hours on average every month (Oseni and Pollit, 2013). Business firms respond to unreliable supply of electricity in a variety of ways which include choice of business, choice of location, output reduction, factor substitution and self generation.

However self generation has been the most widely adopted strategy (Lee and Anas, 1989; Adenikinju, 2005). Firms invest in back up capacity to generate their own electricity during power outage. Reinikka and Svensson (2002) found that unreliable and inadequate electric power supply (which compelled firms to invest in back up generations) greatly reduces firms' investment in other productive activities. In Nigeria, it has been estimated that firms self generate their electricity at a cost that ranges between 16 to 30 times higher than the publicly provided electricity (UNDP/World Bank, 1993). Unreliable supply of electricity imposes enormous costs on the firm. Such costs include raw materials, damages, equipments spoilage and lose of productive man-hours and forgone sales, disruption of production, reduced profits and management attention. As a strategy of mitigating the costs of unreliable or inadequate

power supply firms invest in back up facilities to generate owned electricity in house. As a result many firms are forced to maintain back-up generation capacity. However self generation of electricity generally costs more than the grid supplied electricity. This cost differential limits the potentials of self generation as a permanent substitute or solution to power supply unreliability. Figure 2 presents the economic costs of electric power outage (as a percentage of GDP) in some selected African countries. Nigeria has the highest with more than 3.5% of GDP (Eberhard, 2009).

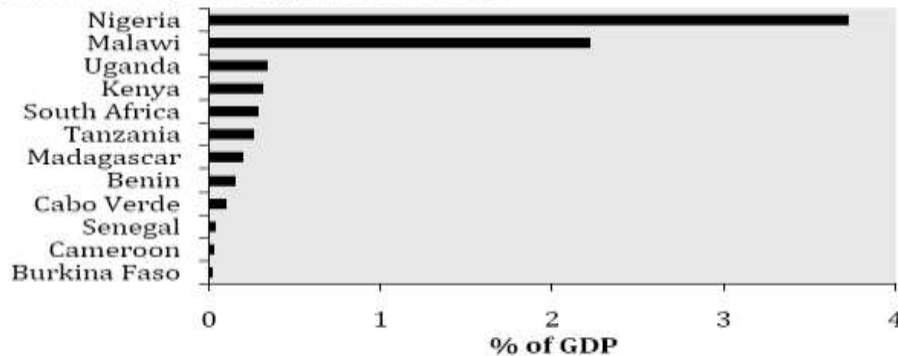


Figure 2: Economic Costs of Power Outages in Selected Countries

Source: Eberhard, et al (2009) reported in Foster and Pushak, (2011)

The distribution of cost imposed by the frequent power outages is disproportionately high for the small scale businesses. Small scale businesses spend about 25% of their investment costs on back up generating plant (Lee and Anas, 1991). Even the large industrial concerns also suffer hugely from electricity supply shortages bedeviling the country. The Manufacturer's Association of Nigeria (MAN) Survey, (2005) reports that the cost for generating power supply by Nigerian firms for production activity amounts to about 36% of firms' costs of production. Iwayemi, (2008) also estimated that 20% of investment in large industrial projects is allocated to alternative source of electricity supply. In fact it is reported that banks insist on provision for captive generating plants before any loan request is considered worthy of being granted (Ajayi, 2005).

The nation's difficult environment is aptly described by the World Bank (2004:135) report that 'manufacturing firms in Nigeria consider inadequate infrastructure particularly power supply as their most severe constrain...' Table 1 depicts electricity to different industrial axes of the country in percentage. The Bauchi, Borno, Benue and Adamawa axis received 52.5% of its power needs in 2003, 19.75% in 2004, 57.55% in 2005 and 60.60% in 2006 receiving on the average about 34.1% of the electricity needs of the region (MAN, 2007)

S/N	ZONE	PERCENTAGE OF POWER SUPPLY BY NEPA/PHCN IN:			
		2003	2004	2005	2006
1.	Oyo, Osun, Ondo, Ekiti Axis	53.00	39.60	26.65	33.30
2.	Edo/Delta Axis	39.30	18.30	64.60	45.70
3.	Anambra/Enugu Axis	43.10	24.13	25.65	23.70
4.	Kano State Axis	24.5	28.75	40.40	39.15
5.	Bauchi, Borno, Benue, Adamawa, Plateau Axis	52.50	19.75	57.55	60.60
6.	Ogun Axis	22.30	46.25	54.35	50.60
7.	Imo/Abia Axis	33.20	28.30	41.85	31.90
8.	Kaduna Axis	44.00	31.25	46.25	27.40
9.	Rivers Axis	45.50	8.00	40.65	44.50
10.	Lagos Axis	48.30	39.18	52.70	52.25
	Average Per Year	40.56	31.30	45.40	41.70

Table 1: PHCN Electricity Supply to Industrial Axes of Nigeria

2.2. Small Scale Businesses

Small scale businesses are very crucial to the economic development of any nation. They make substantial contributions to the economy through many channels. For example small scale enterprises are known to make about 55% of GDP and 65% of employment in high income countries. In the low income countries small scale businesses contribute over 60% of GDP and about 70% of total employment (Fan, 2003; Ariyo, 2006). Their economic contribution in Nigeria falls below expectation due largely to the harsh economic environment (Osotimehin, Jegede, Akinlabi and Olajide, 2012). The shallow infrastructure base of the economy means that small scale businesses just like other businesses will have face serious operational challenges and must have to provide for most of their infrastructure needs if they have to optimise their operations.

2.3. Empirical Review

Adenikinju (2005) undertook an analysis of the economic costs of power outages in Nigeria using the revealed preference approach. He estimated the marginal cost of power outages to businesses in Nigeria to be in the range of \$0.94 to \$3.13 per kWh of lost electricity. Reinikka and Svensson (2002) analyzed the impact of poor provision of infrastructure on firm performance in Uganda using a discrete choice model on business survey data. They concluded that unreliable power supply causes firms to substitute complementary capital (for backup generators) as a response to deficient public services. Estimating investment equations on the same data, they found that poor complementary public capital significantly reduced private investment. Lee and Anas (1991) in their study on manufacturers responses to infrastructure deficiencies in Nigeria reported four different response patterns adopted by manufacturing firms which include self sufficiency (where the firm provides all its infrastructure needs), standby private provision (the firm has its own facilities which it turns to when public supplies is absent or quality and reliability falls below acceptable standards), public source as standby (the firm relies on its own facilities and turn to public supply when the quality and reliability improves) and captivity (where relies entirely on the public service despite the quality and reliability of such supplies. Lee, Anas, Verma and Murray, (1996) in their study of reasons for self generation of electricity by manufacturing firms in Nigeria, Indonesia and Thailand found that because of economies of scale in internal electricity generation enjoyed by larger firms, small scale businesses are at disadvantage and therefore suffer more from electricity supply unreliability than larger firms. Idah (2009) undertook an empirical study on the effect of electricity supply on industrial development in Nigeria and found that the dismal performance of the electricity sector has contributed in retarding the industrial development of Nigeria. He therefore concluded that fixing the electricity sector is key to the realization of industrial development of Nigeria.

2.4. Methodology and Data Analysis

The research surveys existing small scale businesses/ firms in Adamawa, Bauchi, Borno Gombe, Taraba and Yobe States that are into manufacturing, service and trading. The research surveys responding firms on their experiences with frequent power supply failure. The research also analyses the impact of the incessant power supply failure on the operations of the responding firms and document their response pattern. From the population of small scale businesses sample was drawn using the simple random sampling technique from the population of SMEs in the North east region. The research generates primary data through the use of structured questionnaire personally distributed to the respondents by the researchers and their assistance.

The questionnaire contains items on the general information of the company (such as the number of employees of the company, turn-over, sectoral classifications among others etc), respondents' experience with power interruptions, respondents' satisfaction with the status of power supply as used by Bliem, (2009). Other important items covered in the questionnaires include the estimate of the costs of power supply deficiency on the respondents operations and the response pattern adopted to deal with the dismal power supply as adopted by Adenikinju, (2005), Lee and Anas(1998), Rennika and Svenson (2002) among others. Data collected were subjected to descriptive analysis (such as percentages, mean, frequency standard deviation) and inferential analysis using regression analysis as suggested by Hairs, Anderson, Tatham and Black (1998). Simple bivariate regression analysis was used to analyse the impact of the IV (deficient electric power supply) on the DV (operations of small scale businesses, response pattern). From a population of 468 firms(Federal Ministry of Industry, 2013) a total of 312 questionnaire were were distributed to small scale businesses in the region out of which about 245 were retrieved. About 4 questionnaires were returned unfilled.241 questionnaires were entered into the data file. 7 questionnaires were found to be defective, data and descriptive analysis.

Table 2 presents descriptive data about the firms surveyed. About 32% of the firms were engaged in manufacturing activities which include bottled and sachet water, block making, bread and confectionaries among others. 35.5% of responding firms are engaged in service provision such as computer and media services, transportation services, barbing and hair dressing, restaurants among others. The remaining 33.3% are engaged in trade. In terms of employment only 9% of the firms surveyed employ more than 50 persons. More than half of the firms have less than 10 persons in their employment. In terms of capital invested about 72% of the responding firms invest less than 27, 000 dollars. Up to 8% of responding firms reported investing more 272 thousand dollars. On annual turn- over, 73.5% of firms reported having a turn-over of less than 14 thousand dollars while only 7% have turn-over in excess of 136 thousand dollars. On the duration of business 56% are less than 5 years while 44% have been in business for more than 5 years. Firms were asked to rate their electricity needs into low, medium and high. About 20% indicated low, while 44% and 36% indicated medium and high respectively. This means that frequent power outages being experienced in the country imposes significant costs on the significant number of small scale firms. On the respondents experience with power outage, about 17 % experienced outage less frequently while 44% experience frequent power outage.

On the other hand 36% indicated they experienced power outage most frequently. On the costs invested in the acquisition of back up generating facility for in house generation of electricity as a proportion of the firm's investment, 30% invest about 5% of their total investment on back up facility while 65% spent about 6-10% of their investment to self provide due to unreliable power supply. On the other hand 5% of the responding firms spent more than 10% of their total investment on the acquisition of generating facility. Cost of generator as a proportion of investment in equipment, 60% spend between 20-29% while 30% spend between 30-50% and 10% spend above 50% of total investment in equipment. Length of managerial experience is found to influence the mitigation decision of firms faced with unreliable supply of electricity (Oseni and Pollit,(2013). Accordingly firms responded as thus; 46.5%, 6-10 years, 43.2% and above 10 years 10.3%

As a way of gauging the willing to pay (WTP) of improved electricity, firms were asked to state their monthly electricity bills. About 59% pay less than 55 dollars per month while 36% 56-105 dollars and 111 and above. On the other hand monthly expenditure on fuelling and

generator maintenance gulps between 111 to 250 dollars for 32% of the respondents and 255-388 dollars for 50% of respondents while 394 dollars for the remaining 18% of the sampled respondents. Finally respondents were asked to state the number of days they stay without light in month. 31% reported 5-10days without electricity in a month, 41% reported 11-15days and 28% reported 16days and above.

Variable	Manufacturing	Service	Trade	Total
Line of Business	31.2	35.5	33.3	100.0
Variable	Less than 10	10-50	Above 50	
Number of Employees	55.6	35.5	9.0	100
Variable	Less than US \$ 27,778	US \$ 27,778-272,222	Above US \$ 272,222	
Capital Invested	71.8	20.5	7.7	100
Variable	Less than US \$ 13,889	US \$ 13,889-136,111	Above US \$ 136,111	
Turn over	73.	20.9	5.6	100
Variable	Less than 5 years	Above 5 years		
Duration of Business	56.0	44.0		100
Variable	Low	Medium	High	
Electricity Needs	19.7	44.4	35.9	100
Variable	Less Frequent	Frequent	Most Frequent	
Experience with Power Outage	17.1	46.6	36.3	100
Variable	5%	6-10%	Above 10%	
Cost of Generator as % of total investment	29.9	65.0	5.1	100
Variable	20-29%	30-50%	Above 50%	
Cost of Generator as Proportion of Investment in Equipment	59.8	29.9	10.3	100
Variable	Less than 5 Years	6-10Years	Above 10 Years	
Length of Managerial Experience	46.5	43.2	10.3	100
Variable	Less than 55dollars	56- 105.5 dollars	111 dollars and above	
Monthly Electricity Bill	59.0	35.9	5.1	100
Variable	111- 250 dollars	255- 388 dollars	394 dollars and above	
Monthly Expenditure on fuelling and maintaining backup generator	32.1	50.0	17.9	100
Variable	5- 10 days	11-15 days	16 days and above	
Number of Days without power in a month	30.8	40.6	28.6	100

Table 2: Descriptive Data.**Source: Field Data, (2015)**

Table 4 presents the model summary and regression ANOVA statistics. The model depicts an r value of .543. This indicates that the independent variable explains variation in the dependent variable by about 54%. A change in the IV will cause a change in the DV by about 54%. Thus a small scale business operation is constrained by deficient and unreliable electricity supply in the north east Nigeria. In other words improvement in electricity supply in the region will improve operational performance of small scale businesses in the region.

Model	R	R Square	Adjusted R Square	Sum of Squares	df	Mean Square	F	Sig.
1	0.543	0.295	0.292					
Summary								
Regression				15.244	1	15.244	97.252	0.000
Residual				36.366	232	0.157		
Total				51.610	233			

Table 4: Model Summary^b and ANOVA^b Statistics**Source: Field data, 2015**

Table 5 presents the model regression coefficients. The table shows p value at 0.000 implying that the influence of the model is significant. The influence of the model is therefore significant and not by chance.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.110	0.172		12.242	0.000
	UPS	0.412	0.042	0.543	9.862	0.000

a. Dependent Variable: FO

Table 5: Model Regression Coefficients

Table 5 indicates the model's reliability statistics. With a Cronbach's alpha of .69 and Cronbach's Alpha on standardized items at .70 the model reliability is highly reliable.

Cronbach's Alpha	Cronbach's Alpha on Standardized Items	N of Items
0.687	0.704	2

Table 6: Reliability Statistics**Source: Field data, 2015**

On the basis of the result of the analyses shown tables we will test our hypothesis that .

The hypothesis states that

Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in the north east Nigeria.

Table 5 shows a p value of 0.000.

Decision rule : Reject Ho if $P < 0.05$

Accept Ho if $P > 0.05$

With this decision rule the null hypothesis is rejected which states that *Deficient electricity supply does not significantly constrain the operational performance of small scale businesses in the north*

east Nigeria and the alternate hypothesis which states that *Deficient electricity supply significantly constrains the operational performance of small scale businesses in the north east Nigeria is accepted*

3.0. Discussion and Conclusions

From the data analysis conducted it is clear that inadequate and unreliable supply of electricity imposes costs to businesses in many ways. Firms are compelled to invest significant amount of their resources as back up facilities to self provide electricity when the publically provided power becomes unreliable or of lower quality. Though such investments are made they deny businesses the use of their scarce resources for other investment as found in Rennieka and Svensson (2002). Additionally not all firms adequately invest to provide for all their needs. That also imposes costs and therefore constrains firms operational performance. In conclusion, there is serious supply deficit of electricity in Nigeria. This greatly hampers businesses especially the small scale subsector. Government needs to consider the issue of power supply reliability very seriously.

References

- ADB, 2009, Annual Report 2009 as cited by Oseni M O and Pollit M, 2013. Economic Costs of Unsupplied Electricity :Evidence from back up Generation among Firms in Africa. EPRG Working Paper no 1326, 2013
- Adenikinju, A., 2005. An Analysis of the Cost of Infrastructure Failure in a Developing Economy: The Case of Electricity Sector in Nigeria. AERC Research Paper 148, African Economic Research Consortium, Nairobi February 2005
- Ajanaku, L., 2007. 'Battling with Darkness, Tell, May, 28-31
- Ajayi, G.A., 1995. *Cost-Benefit Analysis of Captive Power Generation by Manufacturing Industries in Nigeria*. Unpublished PhD thesis, Department of Economics, University of Ibadan, Ibadan.
- Ariyo, D. (2006). Small firms are the backbone of the Nigerian economy. Retrieved September 14, 2006. www.afbis.com/analysis/small.htm as cited in Essien B.S., 2014. Nigerian Business Environment and Growth Constraints of Micro and Small Scale Manufacturing Industries. American International Journal of Social Science3(6) 2014
- Bental, B., and Ravid, S. A., 1982. "A Simple Method for Evaluating the Marginal Cost of Unsupplied Electricity," *The Bell Journal of Economics*, 13, 1, 249-253.42, 2, 79-119.
- Beenstock, M., Goldin, E., and Haitovsky, Y., 1997. "The Cost of Power Outages in the Business and Public Sectors in Israel: Revealed Preference vs. Subjective Valuation," *Energy Journal*, 18, 2, 39- 61.
- Caves, D.W., Herriges, J.A., and Windle, R.J., 1992. "The Cost of Power Interruptions in the Industrial Sector: Estimates Derived from Interruptible Service Programs," *Land Economics*, 68, 49- 61.
- DOE, 2003. A Framework and Review of Customer Outage Costs: Integration and Analysis of Electric Utility Outage Cost Surveys. US Department of Energy .
- Eberhard, Antonne, Vivien Foster, Cecilia Briceño-Garmendia, Fatimata Ouedraogo, Daniel Camos, and Maria Shkaratan. 2009.—Underpowered: The State of the Power Sector in Sub-Saharan Africa. AICD Background Paper 6, Africa Region, World Bank, Washington, DC as cited in Foster V and Pushak N., 2011. Nigeria's Infrastructure: A Continental Perspective. World Bank Policy Research Working Papers no5686.
- Ekpo, A. H. (2009). 'The Global Economic Crisis and the Crises in the Nigerian Economy', Presidential Address to the 50th Conference of the Nigerian Economic Society, September, Abuja-Nigeria.

- Fan, Q. (2003). Importance of SMEs and the role of public support in promoting SME development. World Bank as cited in Essien B.S., 2014. Nigerian Business Environment and Growth Constraints of Micro and Small Scale Manufacturing Industries. American International Journal of Social Science 3(6) 2014
- FGN, 2008. Investment Opportunities in the Nigerian Power Sector and Investors' Comforts guide. A publication of the Federal Ministry of Power, Abuja 2008
- FGN, 2010. Roadmap to Power Sector Reform. Presidential Speech at the Unveiling of the Government Power Sector Reform Roadmap, held at the Eko Hotel and Suites Lagos August 2010
- Foster V and Pushak N., 2011. Nigeria's Infrastructure: A Continental Perspective. World Bank Policy Research Working Papers no5686.
- Foster, V and Steinbuks, J., 2008. Paying the Price of Unreliable Power Supplies; In- House Generation of Electricity in Africa. Africa Infrastructure Country Diagnostic Working Paper No 2
- Hairs, FJ, Anderson, ER, Tatham, LR and Black CW., 1998. **Multi Variate Data Analysis**. 5th Ed. Prentice Hall.
- Ibrahim, U., 2008. An Analysis of the Strategic Factors that Affecting the Performamcne of Small and Medium Industries. An unpublished Phd Thesis Submitted to Sant Clement University
- Iwayemi, A., 2008 Nigeria Dual Energy Problems; Policy Issues and Challenges. International Association of Energy Economists
- Iyanda, O., 1982. "Cost and Marketing Implications of Electric power Failures on high Income Households in Lagos". The Nigerian Journal of Economic and Social Studies, 24(2): 169-84.
- Lawal, L., 2008. Nigeria; a Case Study in Power Shortages. Published in the Punch Newspaper April 10, 2008
- Lee, Kyu Sik and Anas, A., 1989. Manufacturers' Responses to Infrastructure Deficiencies in Nigeria Private Alternatives and Policy Options. Infrastructure and Urban Development Department, The World Bank,
- Lee, K.S. and A. Anas. 1991. "Manufacturers' responses to infrastructure deficiencies in Nigeria: Private alternatives and options". In A. Chibber and S. Fischer, eds., *Economic Reform in Sub-Saharan Africa*. A World Bank Symposium . Adenikinju, A., 2005. An Analysis of the Cost of Infrastructure Failure in a Developing Economy: The Case of Electricity Sector in Nigeria. AERC Research Paper 148, African Economic Research Consortium, Nairobi February 2005
- Lee, K.S and A. Anas. 1992. *Impacts of Infrastructure Deficiencies on Nigerian Manufacturing: Private Alternatives and Policy Options*. Infrastructure and Urban Development Department Report No. 98. World Bank, Infrastructure and Urban Development Department, Washington, D.C.
- Lee SK, Verma, S and Murray M, 1996. Why Manufacturing Firms Produce Some Electricity Internally. World Bank Policy Research Working Paper, 1605.
- MAN, 2007. Economic Review 2003-2006. A publication oof the Manufacturers Association of Nigeria
- Olugbenga, K. T., Jumah, A., and Phillips, D.A., 2013. Current and Future Challenges of Electricity Market in Nigeria in the face of Deregulation Process. African Journal of Engineering Research 1(2).

-
- Onuaha, K.C., 2010. The Electricity Industry in Nigeria: What are the Challenges and Options Available to Improve the Sector? *Centre for Energy, Petroleum and Mineral Law and Policy – University of Dundee*.
- Oseni M O and Pollit M, 2013. Economic Costs of Unsupplied Electricity :Evidence from back up Generation among Firms in Africa. EPRG Working Paper no 1326, 2013.
- Osoimehin, K. O.; Jegede, C. A.; Akinlabi, B. H., and Olajide, O. T., 2012. An Evaluation of the Challenges and Prospects of Micro and Small Scale Enterprises Development in Nigeria. *American Journal of Contemporary Research*.
- Reinikka, R., & Svensson, J., 2002. Coping with Poor Public Capital. *Journal of Development Economics*, 69, 51 – 69.
- Uchendu, O.A ., 1993. “The economic cost of electricity outages: Evidence from a sample study of industrial and commercial firms in the Lagos area of Nigeria”. *CBN Economic and Financial Review*, 31.
- Uda, E. N., 2010. Industrial Development, Electricity Crisis and Economic Performance in Nigeria. *European Journal of Economics, Finance and Administrative Sciences*. Issues 18, 2010
- Ukpong, I.I., 1973. “The Economic Consequences of Electric Power Failures”. *The Nigerian Journal of Economic and Social Studies*, 15(1): 53–74.
- World Bank , (2004) Manufacturing and Investment in the Sub-Saharan Africa. Washington D.C: The World Bank Publication
-