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Effect of Power Supply on the Performance of Abuja Electricity Company of Nigeria

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Abstract: *The study assessed the effect of power supply on the performance of Abuja Electricity Company of Nigeria (Kogi, Niger, Nassarwa and Abuja). The study adopted a survey research design. The population of the study consists of 6012 SMEs in Kogi, Niger, Nassarwa and Abuja. The study used Taro Yamane's formula to determine the sample size of 375 owners of SMEs in Kogi, Niger, Nassarwa and Abuja. The method of data collection used in this study was a questionnaire that was administered to the respondents. The statistical tools used is regression. The findings revealed that power supply as a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT. Also, access to power supply has a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja. The study recommended that Abuja Electricity Company of Nigeria that covered Kogi State, Niger State, Nasarawa State and FCT, Abuja should re-strategizes their supply of power in the areas for SMEs growth. They should try to improve on the access to electricity in the Areas since SMEs growth can develop the areas. The SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja should try employed adequate growth strategy to improve the SMEs sector in the selected States of Nigeria.*

Keywords: *Power Supply, access to power supply, performance and growth.*

I. Introduction

Power supply serves as an indispensable input in SMEs activities. Apart from its necessity for running many industrial machines, its role in the productivity of human capital is enormous. Virtually, all business activities, especially industrial units, require a constant and effective flow of electricity. Similarly, serving as an input in production processes, electricity also contributes greatly to product marketing. In many cases, availability of power supply plays important role in storing finished goods ahead of demand and therefore enhances consumers' satisfaction by assisting in making the goods available to consumers when needed. This also helps in building firm's image and protects firm's reputation as a result of customer's trust being sustained on having their demand met.

The supply of e1ecricity supply of in Nigeria is devilled with consistent crisis as exemplified by such indicators as electricity blackouts and persistent on self generating electricity. As noted by Ekpo (2009), Nigeria is running a generator economy with its adverse effect on cost of production. The country's electricity market is dominated on supply side by a state owned monopoly —Nigeria Electricity Distribution Company (NEDC), the private and current owner of the former Power Holding Company of Nigeria (PHCN) and the National Electrical Power Authority (NEPA) —has been incapable of providing minimum acceptable international standards of electricity service that is reliable, accessible and available for the past decades

Access to a reliable electricity supply is widely considered to be vital to the operations of most small and medium-scale businesses (World Bank Enterprise Surveys, 2013). The analysis of Enterprise Survey data according to Foster and Steinbuks (2008), in middle and lower income countries, firms themselves consider access to electricity to be one of the biggest constraints to their business. Inadequate electricity services can constrain business operations because a supply of electricity may simply be unavailable and, if it is available, securing a connection may be difficult and the supply unreliable, even before its cost is considered. High quality and accessible infrastructure encourages productivity, business growth and investment, but when it is poor and unreliable, businesses' productivity and growth suffer.

An unreliable electricity supply can affect several aspects of business operations. The most significant impacts to productivity can be due to forced and unexpected halts in manufacturing processes, including running assembly lines, using machine tools, or producing any products. Communications, delivery times, lighting and refrigeration are also affected by electricity insecurity, with consequences for the routine operation of businesses and their ability to ensure delivery times (Adenikinju, 2005)

There are several efforts made by the government of Nigeria to improve power supply for utilization of SMEs for growth and performance in Kogi, Niger, Nassarwa and Abuja. Government of Nigeria entered into privatization, commercialization and finally public private partnership to improve supply of electricity in Nigeria. Yet, SMEs in Kogi, Niger, Nassarwa and Abuja complain about poor access to power supply which affected the performance of the SMEs in Nigeria.

The main objective of this study was to examine the effect of power supply on the performance in Kogi, Niger, Nassarwa and Abuja. The other specific objective of this study is to: determine the effect of access to power supply on the performance ofin Kogi, Niger, Nassarwa and Abuja.

The scope of this study is restricted to the effect of power supply on the performance of SMEs in in Kogi, Niger, Nassarwa and Abuja. The study covered access to power supply such as access to power are available when needed, reliable, of good quality, affordable. Also, performance in terms of growth as expanding by increasing overall customer base, output per customer and new sales which is the dependent variable.

II. Conceptual Review

Power supply is an electronic device that supplies electric energy to an electrical load (Xiaohua&Zhenmin, 2001).Access to power supply according to a World Bank study is described as „the ability to avail energy that is adequate, available when needed, reliable, of good quality, affordable, legal, convenient, healthy and safe, for all required energy services across households, productive and community uses‟ (ESMAP, 2014).Two types of measures are available for determining access to electricity by business entities: the binary measure and the multi-tier framework developed by the World Bank. The binary measure is the traditional method that measures access to electricity on two scales: available and not available. This kind of measure had been found to be grossly inadequate to measure the level of electricity supply in a business environment especially in the developing countries, as mere connection to electricity grid does not guarantee services at the right quality and quantity (Odarno, Agarwal, Devi, & Takahashi, 2016). However, a more convenient measure has been provided by the World Bank in conjunction with International Energy Agency (IEA) which they called Multi-Tier Framework (MTF) (ESMAP, 2014). The multi-tier framework measures electricity access as a continuum of improvement, based on the performance of the electricity supply. The MTF classifies access to electricity on the basis of capacity, duration, reliability, quality, affordability, legality, health and safety.

Performance is measured using diverse parameters by different organizations some firms measure it through expansion, survival, number of employees and capital employed. According to Hornsby (2000) performance is described as an action or achievement considered in relation to how successful it is. Performances are variously measured and the perspectives are tied together and consistently monitored from the organization context. Considering Hornsby's definition, it can be reasonably concluded that performance is synonymous with success. Also, performance is in two forms which are financial performance and non-financial (Akyuz&Opusunju, 2019).

Delmar, Davidson and Gartner (2003) posited that various scholars use growth indicators such as assets, market share, physical output and profits to measure business performance.The desire for business growth is the only medium through which SMEs can become larger organisations; business growth is closely linked to employment creation (Davidsson, Achtenhagen&Naldi, 2010). Growth of a business is a complex concept and takes two broad forms namely; organic (expanding by increasing overall customer base, output per customer and new sales) and inorganic (expansion through mergers, acquisitions or takeovers). Choice of the method of growth depends on the type of business, resources available, time, money and equity sweat the owner is ready to spend. Strategies for growth and implication management include penetration strategies, market development strategies, product development strategies and diversification (Robert, 2009).

III. Contrast Theory

According to this theory of contrast, when actual product performance falls short of consumer's expectations about the product, the contrast between the expectation and outcome will cause the consumer to exaggerate the disparity (Yi, 1990). The Contrast theory maintains that a customer, who receives a product less valuable than expected, will magnify the difference between the products received and the product expected (Cardozzo, 1965). This theory predicts that product performance below expectations will be rated poorer than it is in reality (Oliver &DeSarbo, 1988). In other words, the Contrast theory would assume that outcomes deviating from expectations will cause the subject to favourably or unfavourably react to the disconfirmation experience in that a negative disconfirmation is believed to result in a poor product evaluation, whereas positive disconfirmation should cause the product to be highly appraised (Oliver, 1977).

IV. The Value Percept Theory

Value-percept disparity theory criticises the predictive expectations used as a comparison standard in the traditional disconfirmation paradigm. Westbrook and Reilly (1983) argue that what is expected from a product may or may not correspond to what is desired or valued in a product. Conversely, that which is valued may or may not correspond to what is expected. Thus, values have been proposed to be a better comparative standard as opposed to expectations in explaining customer satisfaction/dissatisfaction. According to the value-percept theory, satisfaction is an emotional response that is triggered by a cognitive evaluative process in which the perceptions of an offer are compared to one's values, needs, wants or desires.

V. Empirical Review

Frederick and Adarkwah (2016) analysed the effect of power supply on the performance of SMEs: a comparative analysis between two regions in Ghana where Small and Medium firms are located. The study uses the current World Bank 2013 Enterprise Survey on Ghana with 403 sampled firms. The study employs chi-square and t-test to do pattern analysis. In addition, ordinary regression analysis (OLS) was employed to regress firm performance variable on electricity supply variable and other covariates. The results show that the power outages affected firm's performance (profitability). In addition, it was further realized that power outages (power interruptions) severely affected SMEs located in the Northern part of Ghana than SMEs located elsewhere.

Modi and Adamu (2016) investigated the impact of power (electricity) supply on the performance of small and medium scale enterprises in Mubi. Primary data were used and the data were generated through questionnaire. The questionnaires were coded and the variables used are the monthly turnover of small and medium scale enterprises in Mubi, KV supplied to SMEs by the power distribution company in Mubi, number of employees, tax, wages and salaries, years of business and the expenditure on alternative power supply. Monthly turnover was used as a proxy to performance while KV was used to proxy power supply. The study employed descriptive analysis, correlation analysis as well as the regression analysis. The results of the analyses revealed that power supply and the performance of small and medium scale enterprises are negatively correlated. However, the regression result showed that power electricity supply has a positive impact on the performance of small and medium scale enterprises in Mubi.

Abubakar and Olusegun (2019) examined the effect of controlling firm characteristics in the energy-business growth relationships. Consistent with this objective, the paper posit that electricity supply is significantly related to SMEs growth in Nigeria. The paper also employed a quantitative methodology. Data were collected through a self-administered survey questionnaire. The questionnaire was adopted from a previous validated survey measuring electricity supply in Nigerian SMEs. The target population consisted of SMEs operating in the city of Kano, Katsina and Jigawa state, Nigeria. Multi-stage sampling was applied to collected data from three stratums i.e manufacturing, hotel & restaurant and wholesale & retail sector SMEs. In the first stage, the SMEs were purposively selected; the next stage involved stratified sampling while SMEs were randomly selected in the third stage. A total of 322 sampled SMEs were invited to participate in the survey. Of these firms 197 SMEs (61 percent response rate) accepted the invitation to fill out the survey questionnaire. Reliability of the measurement model is tested using Chronbach Alpha while multiple linear regression model is incorporated to test the hypothesis. The study found that, relationship exists between SMEs growth, electricity supply and firm characteristics (firm age, size and leverage). Specifically, the relationship is positively strong between SMEs growth, electricity supply and firm age whereas both firm size and leverage had a similar less relationships.

VI. Methodology

The study used survey design employing the use of a questionnaire to obtain information from respondents. The essence of using a survey research design is based on the simple fact that it involves the present state of the event at a particular point in time. The population of this study comprised the owners of small and medium scale enterprises within Federal Capital Territory, Niger State, Kogi State and Nassarawa State. According to the National Micro, Small and Medium Enterprises (MSME) Survey Report (2013) the total population of owners of small and medium enterprises in the selected states is 6012. However, the population of this study is 6012.

The sample size was derived using the Taro Yamane formula; which is stated below.
N =N/1+N(e)2
Where N is the population size
E is the margin of error (assume 5%)
1 = constant
e = 0.05
n = 6012/1+6012(0.05)2
n =6012/1+6012(0.0025)
n = 6012/1 +15.03
n = 6012/16.03
n = 375
However, the sample size of 375 was considered in this study and 375 copies of questionnaire were administered to the respondents in the study.
The study employed a structured questionnaire to obtain responses from the respondents. The structured questionnaire served as a vital tool for the collection of data for the study. The administered questionnaire was used to obtain all the necessary information needed for the research work to ensure effectiveness. The use of the instrument was to obtain their views and ideas on the variables. A five-point Likert scale questionnaire was designed to elicit information from respondents. A questionnaire is a research instrument consisting of a series of questions to gather information from respondents. Moreover, it is designed for the statistical analysis of the responses from respondents. It allows the respondents to supply answers that are confidential to them. The questionnaire will be administered randomly. The questionnaire was administered to the owners of small and medium scale enterprise in Federal Capital Territory, Niger State, Kogi State and Nassarawa State. Respondent filled and returned the completed questionnaire.

A pretest was conducted in which the questionnaire was administered to respondents to determine the reliability of the study. Also, Cronbach Alpha was used to measure the internal consistency and according to Sekran,(2001) Alpha values for each instrument under study should not be less than 0.6. The result of the reliability test is presented below.

Table 1:

Test for Validity and Reliability of Variables

Variables	Cronbach's Alpha
Growth of SMEs	.826
Access to power	.785

Source researcher's computation (2020).

The result obtained from the analysis using SPSS version 20 indicate that the variables used in this study were reliable.

For the study, the dependent variable is performance of SMEs which was proxy by growth and the independent variable is power electricity which was measured by access to power. The model is stated as follows:

$GT = \alpha + \beta 1\ ACP + \mu$ …….. 3.1

Where GT = growth of SMES

ACP = access to electricity power

α is the intercept β1 is the parameter to estimated as the independent variable

The study adopted simple percentage and descriptive statistics. The study also used regression technique. Regression was used for the estimation of the performance of small scale enterprise which is the dependent variable was used to regress on the independent variable proxy supply of power. The F statistics and the T statistics coefficient measure the relative significance of each of the independent variables and Durbin- Watson test for autocorrelation on of errors in the regression equation.The output showed that the t- statistics and p-value for the co-efficient which will result in either rejection or acceptance of the null hypothesis. The p-value which is the probability of getting a result that is at the extreme as the critical value will help in accommodating the error factors in the study. The coefficient of determination (R2) was also revealed and it measures the proportion of the dependent variables that have been explained by the regression model. The range of the coefficient of determination (R2) will range between 0% - 100%. It is necessary that when the value of R2 is closer to 100%, it will show that more independent variables explain the variation in the dependent variable captured in the hypothesis. The level of significance will be set at 1%, 5% and 10% to determine whether to accept or reject the null hypothesis.

The measurements of the variables are indicating below:Growth is measure with expanding by increasing overall customer base, output per customer and new sales which is the dependent variable. Access to power is represented with (ACP). The measurements of access to power are available when needed, reliable, of good quality, affordable.

VII. Data Presentation and Analysis

The following data were collected from the respondents who are the owners of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja. The states are included in Abuja Distribution company of Nigeria. The questionnaire returned was only 246 and this was used to analyse data in this study.

Table 2: Assessment of Access to power supply among SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja

Items	5	4	3	2	1
Owners of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja believed that powers are available when needed by them	78(31.71)	88(35.77)	10(4.07)	33(13.41)	37(15.04)
The reliability of power supply in Kogi State, Niger State, Nasarawa State and FCT, Abuja is very poor	73(29.67)	78(31.71)	12(4.87)	23(9.35)	60(24.39)
Power supply is affordable in Kogi State, Niger State, Nasarawa State and FCT, Abuja for SMEs use	68(27.64)	61(24.79)	20(8.13)	42(17.07)	55(22.36)

Source: Survey, 2020

From the above table, it was discovered that majority of the respondents strongly agreed (31.71%) and agreed (35.77%) to the statement that Owners of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja believed that powers are available when needed by them. 13.41% strongly disagreed and 15.04% disagreed with the said statement while only 4.07% were undecided.

It was also observed that the majority of the respondents, 29.67% and 31.71% strongly agreed and agreed respectively that The reliability of power supply in Kogi State, Niger State, Nasarawa State and FCT, Abuja is very poor. 9.35% and 24.39% strongly disagreed and disagreed respectively, while only 4.35% were undecided.

From the table also, the majority of the respondents 27.64% and 24.79% strongly agreed and agreed respectively that power supply is affordable in Kogi State, Niger State, Nasarawa State and FCT, Abuja for SMEs use. 17.07% and 22.36% strongly disagreed and disagreed respectively, while 8.13% were undecided.

Table 3: Assessment of Growthof SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja

Items	5	4	3	2	1
SMEs in Kogi, Niger, Nasarawa and FCT, Abuja are expanding their customer base	80(32.52)	98(39.84)	31(12.60)	10(4.07)	27(10.98)
SMEs recorded increase in output per their customers	78(31.71)	80(32.52)	29(11.79)	23(9.35)	36(14.63)
SMEs in Kogi, Niger, Nasarawa and FCT, Abuja usually have drastic increase in sales	77(31.30)	88(35.77)	30(12.19)	22(8.94)	29(11.79)

Source: Survey, 2020

From the above table, it was discovered that majority of the respondents strongly agreed (32.52%) and agreed (39.84%) to the statement that SMEs in Kogi, Niger, Nasarawa and FCT, Abuja are expanding their customer base. 4.07% strongly disagreed and 10.98% disagreed with the said statement while only 12.60% were undecided.

It was also observed that the majority of the respondents, 31.71% and 32.52% strongly agreed and agreed respectively that SMEs recorded increase in output per their customers. 9.35% and 14.63% strongly disagreed and disagreed respectively, while only 11.79% were undecided.

From the table also, the majority of the respondents 31.30% and 35.77% strongly agreed and agreed respectively that SMEs in Kogi, Niger, Nasarawa and FCT, Abuja usually have drastic increase in sales. 8.94% and 11.79% strongly disagreed and disagreed respectively, while 12.19% were undecided.

VIII. Data Analysis

Table 4: Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
GT	392	1.00	5.00	3.2194	1.56458
ACP	246	1.00	5.00	3.5325	1.39860
Valid N (listwise)	246				

Source SPSS version 20.00

The table 4 revealed that the result of descriptive statistics which indicated the mean and standard deviation as well as the minimum and maximum value of the variables. The mean value of performance in terms of growth (GT) is 3.21 and access to power supply (ACP) is 3.53. The table also recorded the standard deviation of the variables.

Table 5. Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889[a]	.791	.789	.31303

a. Predictors: (Constant), ACP

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	90.173	2	45.086	460.124	.000[b]
	Residual	23.811	243	.098		
	Total	113.984	245			

a. Dependent Variable: GT

b. Predictors: (Constant), ACP

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.745	.056		48.926	.000
	ACP	-.210	.045	.385	-4.674	.000

a. Dependent Variable: GT

Source: SPSS version 20.000; output result 2020

Decision rule: 5%

The regression result shows that the model is fit for the study since the f-statistics is significant at 5% level of significance. The result also shows that access to power supply has a negative and significant effect on the performance of (growth)SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja. Thisnegative effectis significant since the P-values are less than 5%. Thus, the study rejects the null hypothesis and concluded that access to power supply has a negative and significant effect on the performance (growth0 of SMEs in Kogi State, Niger State, Nasarawa State and FCT. Abuja.

The R^2 = 0.79 indicates that only 79% of variation on power supply can be used to explain by the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT but 21% can be explained by other factors not noted in the regression model which is referred to as error term.

IX. Discussion of Findings

The study found out power supply as a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT. Also, access to power supply has a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja. The study is in line with the findings of ModiabndAdmau (2016) and Abubakar et al (2019)who found significant effect relationship between the variables. However, the study disagreed with their findings by finding a negative effect of the variables. The study is also in line with theory of contrast which states that when actual product performance falls short of consumer's expectations about the product, the contrast between the expectation and outcome will cause the consumer to exaggerate the disparity (Yi, 1990).

However, this negative effect is due to inability of power generating company in Abuja to provide available and reliable power to SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja. The SMEs in Abuja use generators to conduct their business activities and the cost of using generating plant is very high which effect the profit of these ventures. The access to power supply in the selected states that Abuja electricity company of Nigeria covered is very poor which made many SMEs firms to also failed since inability of power reduced the growth of the SMEs in Nigeria.

Conclusions

The study concluded that power supply as a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT. Also, access to power supply has a negative and significant effect on the performance (growth) of SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja.

The study recommended that:

Abuja Electricity Company of Nigeria that covered Kogi State, Niger State, Nasarawa State and FCT, Abuja should re-strategies their supply of power in the areas for SMEs growth. They should try to improve on the access to electricity in the Areas since SMEs growth can develop the areas. The SMEs in Kogi State, Niger State, Nasarawa State and FCT, Abuja should try employed adequate growth strategy to improve the SMEs sector in the selected States of Nigeria.

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