

EFFECT OF ELECTRICITY DISTRIBUTION ON SMALL AND MEDIUM ENTERPRISES (SMES) PERFORMANCE IN SOUTHERN - TARABA STATE

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Abstract

This study examined the effect of Electricity Distribution on small and medium enterprises' (SMEs) performance in Southern - Taraba state. The specific objectives of this study are to: evaluate the effect of stability in power supply on SMEs Performance and assess the cost-effect of power supply on SMEs Performance in the study area. The data used for the study were primary data obtained through open-ended questionnaires. A total of 114 copies of questionnaires were administered to 114 managers of registered SMEs in Southern Zone: IBI, Wukari, Donga, Takum and Ussa through simple random sampling technique. Where only 105 questionnaires representing 92.12% were returned in useable form for this study. It applied descriptive statistics and ordinary least squares methods. The study revealed that stability in power supply and cost of power supply proved positive and significant effect on SMEs Performance in the study area. It concluded that electricity distribution to SMEs has positive effects on SMEs performance in Southern - Taraba state. Therefore, it recommended that government should provide constant and steady electricity supply and minimise the cost of energy rate for SMES in order to improve profitability of SMEs in Nigeria.

Keywords: SMEs Performance, stability, Cost, electricity-distribution, Southern-Taraba, OLS.

Background to the study

Small and medium enterprises has contributed 49.79% of the National Gross Domestic product (GDP), accounted for 76% of total employment and it has been contributing about 7.64% to total export in Nigeria (National Survey of SMEs, 2021). SMEs has played vital role in national development, their contribution to economic growth in Nigeria has remained low due to number of factors which include poor electricity supply, high cost of power and poor policy on SMEs in the country. Nigerian SMEs face growing challenges in developing Countries Nigeria inclusive ranging from low capacity utilization, the cost of doing business has increased tremendously, widening trade imbalance, stiff competition from developed countries, and high mortality rate of enterprises. The implication is that small and medium scale industries are collapsing on the daily basis and competitiveness are weakening by the detrimental effect on productivity which in turn reduces the growth potential of economy.

SMEs has been face with critical constraints to SMEs performance in recent decades, a large volume of published studies around the subject unveil that energy-business growth relationship was inconsistent. Some studies argue that there is strong relationship between the two variables (Escribano et al., 2009; Fedderke & Bogetic, 2006; Grimm et al., 2011; Kirubi et al., 2009; Legros et al., 2011; Mayer-Tasch et al., 2013; Osobase, Anthony, Bakare & Tunde, 2014; Solomon & Yao. 2015; Ukpong, 1993), but no less believe that the two variables do not have a strong relationship (Chissokho & Seck, 2013; Maleko, 2005; Meadows, Riley, Rao, and Harris, 2003; Tarun, Uddin, & Ambarish, 2013). However, there is remarkable lack of empirical evidence determining to resolve the inconsistency in the result of the relationship between electricity supply and SMEs performance.

Sector of electricity power is one of the most important sectors to national development. It is also critical to the developmental reform of any country. The Power Holding Company of Nigeria (PHCN) formerly known as the National Electric Power Authority (NEPA) is an organization involved in the supply and distribution of electricity in Nigeria. In Nigeria, the Power Holding

Company of Nigeria (PHCN) is the public utility company saddled with the task of managing the power sector. PHCN was established in 1972 with a mandate to maintain an efficient system of electric supply to all parts of the Nigeria. After NEPA was renamed PHCN, the government also unbundled 18 successor companies from the PHCN – six generation companies; one transmission company and 11 distribution companies. These networks are made up of wires, pipes, transformers, valves, meters and poles and these networks needs to be managed by a complex database in order to censure effectiveness of operation (Clodius, 2014).

However, electricity is a basic and integral component of the overall development of any nation and one of the critical infrastructural requirements for agricultural, industrial and socio-economic development of rural or remote environment. Another use of electricity is to power electronics such as television set which provides both entertainment, health programmes, thus electricity is expected to improved quality of life. There is also a greater willingness of health and education workers to stay in communities that have electricity (Word Bank 2008). Clodius (2014) defined electricity as a form of energy usually supply by wires or batteries used to power machines and computing, communications, lighting, and heating devices.

Besides, no known studies specifically attempt to include control variables in the studies in order to establish a true link between the studies variables and keep the results reasonable with stronger conclusion. Realizing these gaps in the extant literature, the current study aims to contribute to the existing literature by empirically exploring the role of control variable (i.e firm characteristics: firm size, firm age and leverage) on the relationships between electricity supply and SMEs performance. The theoretical contribution of this research is in exploring the association between electricity supply and SMEs performance in Nigeria. Furthermore, SMEs performance depend on Electricity Supply in other to reduce the cost of doing business. Electricity outage has affected SMEs performance negatively because of non-availability or high cost of electricity supply to firms.

Statement of the problem

Electricity distribution is vital factor for SMESs performance in the world. However, the epileptic electricity supply is common in most states in Nigeria is inclusive, and this has hinder substantial contribution to economic development by many SMEs in Nigeria, many Government has come on-board to put an end to the power failure and it could provide solution to this menace. Seemingly, Adisa et al. (2014) in their study declare that fluctuations in electricity voltage and power outages affect the performance of SMEs in Nigeria. The result implies that electricity infrastructure is a genuine imperative on SME performance. Hence, this study examine the effect of electricity distribution on SMEs performance in Southern- Taraba State

According to Iwayemi (2018), a total loss of output estimated at US\$470billion (N71 trillion) in terms of gross domestic product (GDP) has been recorded between 1999 and 2015 in Nigerian economy due to power outages. Poor access to electricity supply has been recognized as a deterrent to growth of SMEs activities (Ugwoke et al., 2016; Doe and Asamoah, 2014; Ogundipe and Apata, 2013).

Also, World Bank Enterprise Survey in 2014 indicated that 35.5% of the small and medium scale firms in Nigerians indicated electricity outages as worrisome trouble to business operations (WBES, 2014).

Objectives of the study

The broad objective of this study is to examine the effect of electricity distribution on SMEs performance in Southern –Taraba State. Meanwhile, the specific objectives are to:

- i. evaluate the effect of stability in power supply on SMEs performance in Southern – Taraba State,
- ii. assess the cost of power supply on SMEs Performance in Southern - Taraba state.

Research questions

- i. How does stability in power supply has effect on SMEs Performance in Southern - Taraba state?
- ii. What are the cost of power supply on SMEs performance in Southern - Taraba state?

Research Hypotheses

Ho₁: Stability in power supply has not significant effect on SMEs performance in Southern - Taraba state

Ho₂: Cost of power supply does not has significant effect on SMEs Performance in Southern - Taraba state.

Significance of the study

This study is significant to all registered and Unregistered SMEs operating in Southern Taraba State. This study position all SMEs in Southern – Taraba for better performance and output. The study serves as a reference material to other researchers who may wish to conduct research work and also for literature review in the field entrepreneurship.

Scope of the study

This study focus on Effect of Electricity Distribution on Performance of Registered SMEs in Southerner Taraba, this study covers all the registered SMEs in the Five (5) LGAs which includes: IBI, Wukari, Donga, Takum and Ussa. However, the study restrict its analysis on stability in power supply and cost-effect of power supply used by the researcher to measure performance of SMEs.

Limitation of the study

The research work encounter Certain limitations which includes: Study area, the researcher limit its study to Southerner – Taraba State because many registered SMEs are scattered in Five (5) LGAs , Ibi, Wukari, Donga, Takum and Ussa. Uncooperative attitudes of some respondents are parts of the constraint the study encountered: Regardless of all these challenges, this study is worth of recommendations and generalization.

Literature Review

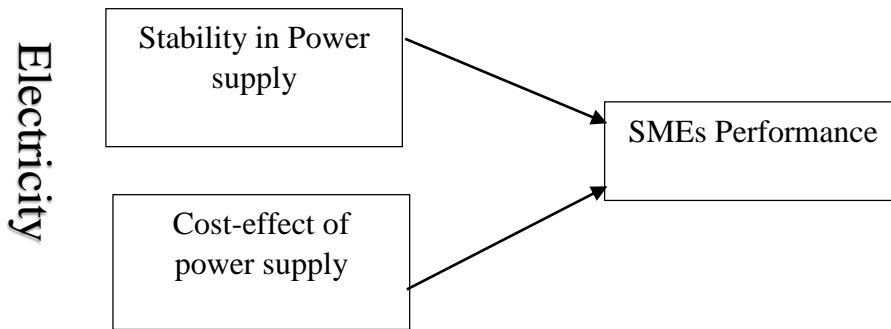
Conceptual framework

Small and Medium Scale Enterprises SMEs are small independent firms that employ few numbers of employees. There is no generally acceptable definition of SMEs. Different definitions cut across number of employees, capital or size of business and revenue, and these definitions vary across countries. European Union defines a medium size enterprise as “one with less than 250 employees with a final ceiling of EUR 50 million and a small firm as one with less than 50 employees with a financial ceiling of EUR 10 million” (European-Union, 2003).

In the United States SMEs are firms with employees fewer than 500. Japan defined SMEs into 3 segments; those in manufacturing wholesale and retail. Manufacturing with less than ¥300m (US\$3. 6m) in capital, wholesale trade with less than ¥100m (US\$1. 2m) in capital, and those in the retail and service trades with less than ¥50m (US\$600,000) in Capital.

The conceptual framework in Figure 1 try to explain the relationship between the various Electricity Supply on the performance of SMEs. The performance of SMEs largely depend on the effectiveness of electricity supply, these help to make businesses to be actively and competitiveness.

Figure 1: **Conceptual Framework**



Source: Field survey, 2022.

SMEs Performance

Performance seems to be conceptualized, operationalized and measured in different ways thus making cross-comparison difficult. In enterprise management, Moullin (2003) defines an organization's performance as "how well the organization is managed" and "the value the organization delivers for customers and other stakeholders." On the other hand, modern literature defines performance as the results of the activities of a company or investment over a given period.

However to attain superior relative – performance, an SME must achieve its expected objective with greater effectiveness and efficiency than its competitors. Effectiveness and efficiency are the two fundamental dimensions of performance – this is emphasized by Neely et al., (2002). Whatever the definition adopted, as Trkman (2009) pointed out, regardless of the size of the firm, firm performance evaluation is very crucial to monitor the success or failure of the firm so as to take proper actions to ensure competitive advantage.

By measuring firm performance, a company can identify its strengths and weaknesses. The reasons of firm performance measurement is to upgrade the extant performance in terms of seeking new opportunities internally or externally, redesigning better strategies or action plans, obtaining overall business performance and capabilities improvements, and acquiring sustainable growth in the long run. In this study, performance is defined as the extent to achieving proposed objectives using resource economically in the face of internal/external environment (stockholders, competitors, society).

Business growth is adopted to measure firm performance in terms of sales growth, growth in market share, assets growth, margin growth so as to be able to clearly determine enterprises ability to meet long term financial obligations (Sirajuddin, Muhammad & Muhammad, 2017).

Electricity Supply

A considerable number of modern literature buttressed that electric power supply is an electronic device that supplies electric energy to an electrical load (Bhagavan, 1999; Louw, Craigwell, & Moore, 2008; Herath, Gebremedhin, & Fletcher, 2011; Hickling, 2006; Holtedahl & Joutz, 2000, 2004; Lin & Quising, 2003; Xiaohua & Zhenmin, 2001). The primary function of a power supply is to convert one form of electrical energy to another.

According to James Watt (1736) electrical energy supply is the quantity of electrical energy delivered to residential, commercial and industrial consumers" electrical load measured by Joule, which is the power consumed by an electrical device (one watt per second). One kilowatt/hour is equal to 1000 watts/hour, which is the operating unit that recorded by the meter. Kilowatt-hours(kWh) is the standard unit of measure for electricity. The concern for reliability of the electricity supply is faced by every country in the world. The expectation that the electricity supply will be reliable is the basis for many decisions and impacts on all sectors of the economy.

According to the CAE (1993) reliability is considered to be made up of two aspects, adequacy and security.

Adequacy "refers to the ability of the electricity system to provide and transport energy to meet the requirements of customers," while security "relates to the ability of the power system to respond to disturbances arising from equipment within either the bulk power system or the local distribution system, and so maintain supply at an acceptable frequency and voltage" (CAE, 1993). Limited access to quality and quantity electricity has remained an unresolved scourge in Nigeria. The ravage cuts across all electric energy utilization sectors in the nation.

Related Empirical Literature

There are scanty literature on the effect of electricity distribution on SMEs performance in Nigeria. However, this study have reviewed some of these studies to form empirical basis to examine the effect of electricity distribution on SMEs performance in Southern Taraba state as: Doe and Asamoah (2014) analysed the stability and accessibility of power supply on SMEs growth in Kwara state. Using descriptive statistics and Chi-square; they submitted that stable and easy access to electricity supply is critical to nations' economic growth and development.

Furthermore, Eytayo and Makhosazana (2021) explored the impact of electricity outages on the operations and contributions of SMEs to Nigeria economy. Hence, the study evaluated the impacts of electricity supply on the growth of SMEs in Nigeria. It analysed the hindrances that deficient electricity supply could have on the growth and development of SMEs. Survey method was employed to administer structured questionnaires to 110 SMEs operators in three local government areas of Mainland, Shomolu and Agege in Lagos state, Nigeria. Descriptive statistics was utilised to analyse the collected data. A chi square method was used to test the formulated hypothesis. Findings revealed that electricity outages have significant effects on SMEs in Nigeria.

More to that, Ogundipe and Apata (2013) study found a strong connection between electricity consumption and economic growth. Likewise, Rud (2012) proclaims that electricity supply and its consumption are connected with efficiency and economic development. Akinyele et al. (2016) affirm that regular and affordable supply of electricity has a pivotal implication in business sustainability and economic growth. As constant electricity supply is essential to business growth and development, so, also, the outages and irregular supply of electricity could have adverse effects on small businesses.

A study by Nuredeen et al. (2018) submit that power outages could have affect SMEs expansion and lead to untimely liquidation. Electricity outages could adversely impact the profitability of SMEs (Scott et al., 2014). In addition, Abotsi (2016) examined electricity outages diminish production efficiency in most developing nations. Over the years, electricity outages have continued to frustrate many business activities in different parts of Nigeria (Adewuyi and Emmanuel, 2018). It is visible that electricity outages have limited expansion of SMEs and discouraged many local and foreign investors. Olatunji (2019) declares that electricity outages have led to migration of many business organisations from Nigeria to different nations.

According to Moyo (2012) concurs that electricity outages affect firms' productivity in Nigerian manufacturing sector. In a nutshell, unstable electricity supply is a serious problem confronting SMEs in Nigeria. In the word of Muhammed et al. (2017) established that electricity supply determines financial performance of the SMEs, especially, manufacturing sector. It is agreed that inadequate electricity supply contrarily influences the efficiency and profit ratio of SMEs (Alhelou et al., 2019; Nkosi and Dikgang, 2018). It was agreed that constant and availability of electricity to SMEs has the inclination to impact employment, destitution, profitability and productivity (Nuredeen et al., 2018; Akinyele et al., 2016). This implies that constant electricity supply SMEs will alleviate the operators from incurring unnecessary expense on alternative back-up.

Muhammed et al. (2017), contribute that economic development and sustainability of SMEs are determined by regular electricity supply for production of goods and services. In the realization of the potentials of SMEs to make a meaningful contribution towards nation's economic

development, federal government of Nigeria have initiated and adopted several strategies that can improve power supply for SMEs in Nigeria.

METHODOLOGY

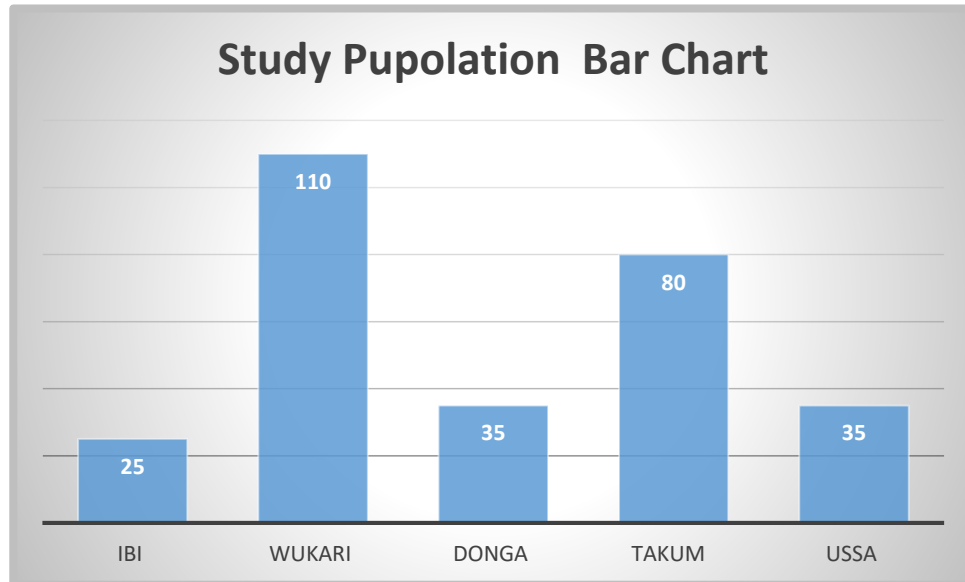
This study employed survey design where research questionnaires were administered to the Small and Medium Enterprise (SMEs) under review. This study adopts primary source of data collection, the target population of this study were all the registered SMEs in all the LGAs of Southern Zone they are: Ibi, Wukari, Donga, Takum and Ussa which stand at two hundred and eighty-five (285) SMEs (NDE Annual report 2020). Moreover, Taro and Yemen’s formula for sampling size determination was applied which result to total number of one hundred and fourteen (114) respondents of SMEs owners and Staff.

The study use simple random sampling techniques to avoid biasness, managers and staff of SMEs were randomly selected to form the sample size of the study and Simple Percentage, Statistical Package of Social Sciences (SPSS) were used by the researcher for the purpose of data analysis and discussions.

Table 2.0.1: Population of the Study

S/N	Registered SMEs in LGAs	Total Population	Percent
1.	Ibi	25	9%
2.	Wukari	110	39%
3.	Donga	35	12%
4.	Takum	80	28%
5.	Ussa	35	12%
	Total	285	100%

Source: Filed Survey 2022



Source: Filed Survey 2022

Table 2.0.1 and Bar Chart shows population target of the study areas, Ibi LGA 25(9%) respondents, Wukari LGA respondents 110(39%), Donga represent 35(12%), Takum LGA respondents represent 80(28%) and Ussa LGA represent 35(12%).

Apart from that, the sample size of this study can be obtain by using Taro and Yemen’s formulae (Taro & Yemen, 1987). The formula is denoted as: $n = N/1+N (e)^2$

Where: N = Population of the study, n = Sample size, e = level of significance (5%), 1 = constant term

The study applied it as follows:

$$n = 285/1+ (285) (0.05)^2$$

n = 285/1+1.5
n = 285/2.5
n = 114 required sample

Table 2.0.2: Respondents’ Response Rate

Questionnaires	Frequency	Percentage
Questionnaires Distributed	114	100%
Questionnaires Returned	105	92.12%
Questionnaires Unreturned	9	7.88%

Source: Field survey, (2022)

In Table 2.0.2, it shows the respondents rate from the sample response. Out of 114 questionnaires distributed, a total of 105 questionnaires representing 92.12% were successfully retrieved, while 9 questionnaires representing 7.88% were not retrieved. With 92.12% questionnaires successfully retrieved from the respondents, the response rate for the study is considered satisfactory as it provides a framework for making a generalization about the sample size of the study.

Data presentation and analysis

Table 2.1.1: Do stability in power supply improve business activities in southern Taraba state?

Respondents	Frequency	Percentage %	Cumulative Freq.
Agree	35	33.33%	35
Strongly Agree	50	47.6%	85
Undecided	5	4.76%	90
Disagree	5	4.76	95
Strongly Disagree	10	9.5%	105
	105	100	

Source: Field Survey: 2022.

From **Table 2.1.1**, it revealed that 30 (33.33%) of the respondents agreed that stability in power supply improve business activities in southern Taraba state. In the same vein, 50 respondents which accounted for 47.6 % strongly agreed that stability in power supply have improved SMEs greatly in Southern Taraba state. Moreover, 5 respondents with 4.76% remain neutral on the course of this study. On the other hand, 5 respondents with 4.76% disagreed and 10 respondents representing 9.5% strongly disagree in the study area.

Table 2.1.2: Cost of power supply improve SMEs performance?

Respondents	Frequency	Percentage %	Cumulated Freq.
Agree	45	42.8 %	45
Strongly Agree	35	33.3 %	80
Undecided	5	4.76%	85
Disagreed	10	9.5%	95
Strongly Disagree	5	4.76%	105
	105	100	

Source: Field Survey: 2022.

From, Table 2.1.2, it showed that 45 (42.8%) of the respondents Agreed that cost of power supply improved SMEs performance in southern Taraba state due to high and constant electricity from National grid within the period of the study. Meanwhile, 35 respondents representing (33.3%) of responses strongly agreed. Moreover, 5 respondents with 4.76% were undecided. However, 10 respondents accounted for 9.5% disagree that cost of power supply has

not effect SMEs performance in southern Taraba state and it was supported by 5 respondents who strongly disagree.

Model Estimation

Firstly, the study conduct dimension reduction on dependent variable i.e SMEs Performance where questionnaires related to SMEs were group and extracted the data through component analysis. Therefore, the study obtained the mean values of variables for its dependent variable in this work. It then proxies it for SMEs Performance in this research based on the field survey questionnaire. Secondly, the study followed the above procedure to collate and source out data for stability in power supply and Cost effect of power supply to apply the model built in Section II for the output from SPSS version 23.

In that order, the next work in this study was the computation of ordinary least squares (OLS) in order to examine the effect of electricity distribution on SMEs performance Southern Taraba state. This result is presented in Table 2.1.4.

Ordinary Least Squares (OLS)

Table 2.1.4: The OLS Result: Dependent variable: **SMP**

Independent variable	Co-efficient	Standard Error	T-Ratios	Sig
Constant	-0.001	.069	-0.021	0.984
Stability in power supply(SPS)	0.603	.074	2.506	0.007
Cost of Power Supply (CPS)	-0.256	.002	3.804	0.021
R = .654 ^a	R ² = 0.713	R ² = 0.692		D-W = 2.021

Source: Computation Using SPSS, Version 23 on Field survey, 2022.

Discussion of the findings

In the Table 2.1.4, the coefficient of the determination R (0.654 or 65%) reveals the relationship between SMEs performance and independent variables (SPS and CPS). It means correlation coefficients which indicates how stability in power supply and cost of power supply influence small and medium enterprises performance in Southern Taraba state.

Moreover, $R^2 = 0.713$, that is, 71% of variation in SMEs performance were due to change in level of power supply and cost of power supply as the main factors that determine business outfit operate in the study area. It implies that 29% to other factors such as timeliness and responsiveness of Power holding company in Nigeria which were not captured in the model. It should be noted that the adjusted R-square ($R^2 = 0.692$) means after removing errors in the model, 69% of change in SMEs performance are fully caused by stability in power supply and cost of power supply in the study area. It can be clearly seen that the model was well constructed and built for this study and it was fit for policy formulations and recommendations based on this research results.

Furthermore, the coefficients of independent variables of 0.603 unit or 60.3%, it means that 1 unit increase in stability in power supply would lead to 0.603 units or 60.3% increase in SMEs performance in the study area. By this coefficient, it address objective (i) of the study which states that to evaluate the effect of stability in power supply (SPS) on SMEs performance in Southern-Taraba State. Here, the impact on SMEs performance was positive effects. This result agree with Eytayo and Makhosazana (2021) explored the impact of electricity outages on the operations and contributions of SMEs to Nigeria economy and submit that that electricity outages have significant effects on SMEs in Nigeria.

In the same, when there was 1 unit increase in Cost of power supply, it would resulted to 0.256 units or 25.6% decrease in SMEs in the study Area. This means cost of power supply is one of the most important factor affecting SMEs performance in Southern-Taraba. Therefore, by the implication of this findings is that small and medium enterprises' performance would be decrease for real in the business operations. It has provided the answer to objective (ii) of this study i.e to assess the cost-effect of power supply on SMEs Performance in Southern - Taraba

state. Its effect was negative on SMEs performance which implied that the *a priori* expectation of the economic theory was true about business environment. More so, Moyo (2012) concurs that electricity outages affect firms' productivity in Nigerian manufacturing sector. Also, it aligned itself to the work of Olatunji (2019) declares that electricity outages have led to migration of many business organisations from Nigeria to different nations.

Test of hypotheses

Ho₁: Stability in Power supply has not significant effect on SMEs performance in Southern - Taraba state

From Table 2.1.4, it provide information to verified the hypothesis (Ho₁) which states that stability in power Supply (SPS) has not significant effect on SMEs performance in Southern - Taraba state. By the rule of thumb, since T-calculated of 2.506 was approximately greater than 2 critical value, then the study strongly reject the Null hypothesis and accepts that SPS positive effect on SMEs Performance in the study area. It can be supported by the Probability value of 0.007 which is less than 0.05 as a standard for measurement.

Ho₂: Cost of power supply (CPS) does not have significant effect on SMEs Performance in Southern -Taraba state

Apart from that, this study tests the second hypothesis which states that: Cost of Power Supply (SPS) does not have significant effect on SMEs Performance in Southern -Taraba state. Using the T-calculated value of 3.804 which was greater than 2 critical value, based on the rule of thumb, the study reject the null hypothesis and concluded that cost of power supply has negative effect on SMEs in the business outfits in Southern Taraba state. This outcome have been supported by the P-value of 0.021 which proved that cost of power supply was statistically significant in the model.

In conclusion, Durbin-Watson statistics (D-W) = 2.021 revealed that there was no presence of serial correlation in the course of the analysis. In this result presented in Table 2.1.4, it was free from spurious regression result. Therefore, it can be used for generalization in small and medium scale enterprises outfits and it possess a good quality for policy recommendations and implementation.

Contribution to knowledge

The study has added to existing literature on Electricity Distribution and SMEs Performance, by empirically validating that Electricity Distribution can also enhance SMEs Performance in Southern Taraba State. This study also contributed to package of knowledge by demonstrating that Electricity Distribution provide positive effect on SMEs Performance and this concur that there is a significant effect of Electricity Distribution on SMEs Performance in the study area.

However, in terms of unique contribution of Electricity Distribution, the study has been able to demonstrate that stability in power Supply has made the highest contribution to SMEs Performance among Business outfit. Finally as a way of contribution to knowledge, this study will serve as a reference point for researchers, scholars and academicians who intend to conduct similar or related studies in the future as it will provide reliable insights that would be useful for educational purposes. The study has been able to gather relevant literatures with in-depth knowledge about Electricity Distribution and SMEs Performance, thus practitioners of SMEs and academicians will benefit from the study.

CONCLUSION

Based on findings, this study concluded that stability in power supply has positive effect on all SMEs performance in Southern –Taraba State. The study also concludes that cost of power supply has negative effect on SMEs performance in the study under review.

RECOMMENDATIONS

The study provides the following policy recommendations:

- i. Government should provide constant and stable electricity supply for higher SMEs performance.
- ii. Government should minimise the cost of power supply in order to improve SMEs performance in Nigeria for high gross domestic product (GDP).

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