

Energy availability and Small and Medium Enterprises: A study of Obio/Akpor Local Government Area of Rivers State

*Adesuwa Agoma¹ and Samuel S. Ogunbiyi²

^{1&2} Finance & Banking Department, University of Port Harcourt, Nigeria.

*Corresponding Author: samuel.ogunbiyi@uniport.edu.ng

Abstract

This study explores how energy availability influences the performance of Small and Medium Enterprises (SMEs) in Obio/Akpor Local Government Area, Rivers State, Nigeria. A total of 347 questionnaires were distributed across five wards, which are Alakahia, Choba, Rumuosi, Ozuoba, and Rumuokoro—and all were completed and validated, giving a 100% response rate. The analysis employed descriptive statistics, correlation, and regression techniques to assess the effects of energy factors on SME performance. The findings show that energy availability and accessibility, energy costs, and reliability of supply together account for 50% of the variation in SME performance ($R^2 = 0.500$). Among these, energy cost had the strongest positive impact ($\beta = 0.298$), followed by energy availability and accessibility ($\beta = 0.262$). The ANOVA results confirmed the robustness of the model, with an F-statistic of 105.405 and a p-value of 0.000, indicating that the independent variables jointly have a significant effect on SME performance. These results highlight the vital role of affordable, reliable, and accessible energy in improving productivity, minimizing disruptions, and enhancing profitability among SMEs. The study recommends stronger collaboration between policymakers, energy providers, and SME operators to strengthen energy infrastructure, lower energy costs, and guarantee reliable energy access to support sustainable SME growth in Obio/Akpor.

Keywords: Accessibility, Availability, Energy, Reliability, SME Performance.

1. Introduction

Small and Medium Enterprises (SMEs) plays a crucial role in driving economic development in developing Nations, their contribution serves as key drivers of economic diversification, employment, poverty reduction, driving innovation, and sustainable growth in Nigeria. Aderemi *et al.* (2020) assert that the role of SMEs is progressively significant in Nigeria, in the sense that through the SMEs available resources are strategically allocated to industrialization driving consumption thereby increasing her economic well-being. In Nigeria, the activities of SMEs play an increasingly important role, according to Udoinyang and Daniel,

(2024) and Udoinyang and Udoinyang, (2023), SMEs are primary vehicles for the creation of the resources necessary for industrialization and consumer spending, both of which contribute to her overall prosperity. Their ability to access cheap, reliable and affordable energy influences their productivity and operational efficiency contributing to their overall economic expansion. Energy is a crucial input to all businesses, particularly SMEs (Gąsior, *et al.*, 2022) In which, accessibility to constant and stable electricity is crucial to the performance of SMEs (Aderemi *et al.*, 2021). This is due to the fact that unreliable power supply

can affect different aspect of business performance.

According to Chad (2018), Ajibola, *et al.* (2021) and Phan, (2022) about 80% SMEs survive their first-year contrast to most believe that most businesses crash within the first years. Nevertheless, the number drops with time, only about Depending on the year the company started, 45. 4 per cent to 51 per cent of small-businesses have survived the last five years. Also, only about 3 business survived for a period of 10 years. Power outages can have debilitating impacts on the manufacturing process by halting productivity, causing damages to machineries, which in turn affects the overall business operation and the ability to ensure delivery times (World Bank, 2018; Arumdeben, *et al.*, 2023 and Yelwa, 2023), this in turn reduce SMEs performance. According to the PricewaterhouseCoopers (PwC 2024) SMEs contribute about 48% of Nigeria's gross domestic product (GDP) and employ over 84% of the workforce.

Energy availability in Nigeria has been a source of concern as the country's energy infrastructure is affected by unreliable supply, frequent power outages and high energy costs. As stated by Ajibola, *et al.* (2021) the country has been making use of about 2,500 to 4,000 megawatts and this has an adverse effect on manufacturing sectors, investments are lost as a result of deficient power supply and because of this Nigeria may continue to lose investors to other African countries. In 2019, the Manufacturer Association of Nigeria stated that many companies and small enterprises are closing down and relocating to Ghana, where adequate electricity exists. A lack of reliable electricity is one of the infrastructure facilities that hinders the efficiency of small and medium-sized businesses throughout the nation. Despite their limited financial resources, almost all SME participants now have backup power

sources to keep their operations running smoothly (Udoinyang & Udoinyang, 2023). Since the manufacturing sector is the major employer of Labour, the problem of electricity has to be resolved since a business cannot successfully run without regular electricity supply (Ajibola, *et al.*, 2021)

While Udoinyang and Udoinyang (2023) argued that the high cost of manufacturing in Nigeria is primarily associated with unreliable power supply, this is because of the critical role of consistent electricity in the operational success of Small and Medium Enterprises (SMEs). Obio/Akpor serves as the economic hub of Rivers State and is bounded by Port Harcourt L.G.A. to the south, Oyigbo to the east, Ikwerre to the north, and Emohua to the west (Ahmed, *et al.*, 2024). Despite enjoying comparatively improved power access over many Nigerian regions, small and medium enterprises in Obio/Akpor LGA continue facing major difficulties stemming from inconsistent electricity supply. In the light of the above, this research therefore attempts to study the effect of energy availability on the performance of SMEs in Obio/ Akpor Local government Area as a case study. This choice of this area of study is motivated due to the fact this area is located in one of the oil rich states in Nigeria and it is also a commercial hub in Rivers State. While studies like those by Udoinyang and Daniel (2024), Yelwa (2023), and Ajibola *et al.* (2021) has provided a useful insights into the relationship between power supply and SME productivity across different regions, few have specifically addressed how energy challenges in a key commercial hub like Rivers State might differ from those in other states, particularly considering its oil wealth. The findings of this study will bridge this gap by focusing on the commercial hub of Rivers State, examining how energy issues uniquely affect SMEs in this oil-

rich region. Therefore, this study aims to fill this gap by examining the relationship between energy availability and SME performance in Rivers State.

Moreover, in order to provide empirical evidence, the study raised the following research questions;

- i. What is the effect of reliability on energy supply on SMEs performance in Obio/Apor LGA?
- ii. What is the impact of energy costs on the financial performance of SMEs in Obio/Apor LGA?
- iii. How do energy availability and accessibility affect the growth of SMEs in Obio/Apor LGA?

2. Literature Review

2.1 Conceptual Framework

2.1.1 Small and Medium Scale Enterprise

The term Small and Medium Scale Enterprises (SMEs) has no generally established definition. In Nigeria, the major criteria used in defining Small Scale Enterprises (SSEs) include number of employees, financial strength, sales value, initial capital outlay, relative size, independent ownership and the type of industry (Ibitomi, *et al* 2024). While Small and Medium Industries Equity Investment Scheme (SMIEIS) (2015) sees SMEs as enterprises with a total capital employed not less than ₦1.5 million, but not exceeding ₦200 million, including working capital, but excluding cost of land and/or with a staff strength of not less than 10 and not more than 300. As cited by Ajibola, *et al.*, (2021) in the federal government's 1990 budget for commercial bank loans, SMEs were defined as those with a yearly turnover below 500,000 naira and, in the case of merchant bank loans, a capital expenditure of no more than 2 million naira (excluding land costs) /a maximum

of 5 million Naira. Esuh and Adebayo (2012) also stated that SMEs are firms or businesses arising as a result of entrepreneurial activities of individual. SME sector is categorized into three namely; micro, small and medium enterprises or businesses. The micro SME's are the smallest among the three categories (Ibitomi, *et al*, 2024).

Afolabi (2013) also stated that SMEs are businesses that employ up to 9 employees. Small businesses employ 10-49 employees while medium enterprises employ 50 to 199 employees. SMEs were recently classified by the Financial System Strategy as businesses with fewer than 300 workers or a yearly revenue of less than 100 million naira (Banji, 2020). As stated by Udoinyang and Daniel (2024) in the United States, companies with 500 or fewer employees were classified as SMEs, while in Japan SMEs are categorized into three main sectors which includes manufacturing, wholesaling and retailing and service trades. But businesses in these sectors are defined as SMEs based on their capital investments, which is expected to not exceed ¥300 million (which is approximately US\$3.6 million) while for manufacturing, ¥100 million (approximately US\$1.2 million) then wholesale trade, and ¥50 million (approximately US\$600,000) for retail and service trades.

2.1.2 Challenges of Small and Medium-Scale Enterprises in Nigeria

The fact that SMEs have not made the desired impact on the Nigerian economy in spite of all the efforts and support of succeeding administrations and governments gives a cause for concern. It underscores the belief that there exist fundamental issues or problems which confront SMEs but which hitherto have either not been addressed at all or have not been wholesomely tackled (Bassey & Imoh, 2021). Emovon, *et al.* (2023) went further to state that the government has

not done enough to create the best possible environment for SMEs to succeed, which includes issues with transportation, water supply, electricity, and solid waste management, among others.

According to Bassey and Imoh (2021), other challenges SMEs experience are discrimination from banks, which are averse to the risk of lending to SMEs especially start-ups; High cost of packaging appropriate business proposals; Uneven competition arising from import tariffs, which at times favour imported finished products; Lack of access to appropriate technology as well as near absence of research and development; High dependence on imported raw materials with the attendant high foreign exchange cost and scarcity at times.

2.2 Theoretical Review

2.2.1 Resource Based View (RBV) Theory

The Resources Based View was Propounded by Jay Barney in 1991 he was of the view that an organization can be considered as a collection of physical resources, human resources and organizational resources, Resources of organizations that are valuable, rare, imperfectly imitable and imperfectly substitutable are main source of sustainable competitive advantage for sustained superior performance (Barney, 1991). That is, he was of the view that resources available to a firm includes physical, human, and financial resources they are all critical to the firm's ability to achieve competitive advantage and also gain superior performance. As stated by Madhani, (2010) A resource must fulfil 'VRIN' criteria in order to provide competitive advantage and sustainable performance. Valuable resources. In simple terms, a resource is valuable if it increases a firm's profitability, improves its efficiency, or helps it better meet customer needs (Barney, 1991). For example, a company with advanced

technology can create innovative products that offer greater value to consumers compared to competitors. Next, rarity, as stated by Peteraf (1993), is the condition in which a resource is hard to find, even among competitors. A rare resource gives a firm a unique advantage because it cannot be easily replicated. Think about how a patent or a unique brand reputation might differentiate a company from others in the market; such resources are rare and provide an edge that others can't quickly match (Uyanik, 2023). The third element, imperfect imitability, according to Lippman and Rumelt (1982) it refers to how difficult it is for competitors to copy a resource. A resource is imperfectly imitable when it's complex or has developed over time in such a way that it can't be easily replicated. Finally, non-substitutability according to Dierickx and Cool (1989) means that the resource cannot be replaced by another that achieves the same outcome. If competitors can easily find an alternative resource that offers the same benefits, the original resource won't provide a sustainable advantage. Here, competitor can't achieve same performance by replacing resources with other alternative resources (Madhani, (2010). The Resource-Based View (RBV) theory by Barney (1991) concentrates on the aspect that competitive advantage for a company arises from unique and tangible resources. In the case of SMEs in Obio/Akpor Local Government Area, access to energy is one such significant resource that has a direct influence on operating efficiency, productivity, and performance. Energy is valuable because it ensures uninterrupted operation, leading to reduced downtime and enhanced business productivity. It is rare in the area, where an unstable power supply is the standard, so SMEs with access to stable energy will be ahead of the competition. Second, access to energy is imperfectly imitable due to infrastructural concerns as well as domestic energy policies, so rivals

will have difficulty replicating successful energy initiatives. Lastly, energy is non-substitutable as there is no alternative source of power that can fully replace the reliability and affordability of stable energy. This model allows the research to interrogate how energy, being a valuable, scarce, and inimitable resource, contributes to the competitiveness and performance of Obio/Akpor SMEs.

2.2.2 Transaction Cost Theory

Transaction cost theory was first introduced by an economist known as Ronald Coase in the year 1937, in this paper titled “The Nature of the firm”, this theory views transactions

As a fundamental unit of analysis and it also emphasizes the effort, resources or costs that is required by two parties to successfully carry out exchange (Williamson, 1981). The goal is to maximize transaction performance and minimize costs de Camargo Fiorini, *et al.* (2018) argue that TCT is useful to study BDA in e-commerce transactions, BDA can benefit online firms by improving market transaction cost efficiency (e.g., buyer-seller interaction online), managerial transaction cost efficiency (e.g., process efficiency) and time cost efficiency (e.g., searching, bargaining and after sale monitoring).

The cost, reliability and accessibility on energy have a great impact on transaction costs, this is because energy plays a key role in SMEs performance. Note, since energy expenses represent a major portion of operational costs, they also have a direct impact on the financial performance of SMEs. As a result, SMEs often aim to reduce these costs by deciding whether to produce energy internally or depend on external suppliers (Henriques & Catarino, 2016; Abdulrahman & Ismaila, 2017). According to Williamson (1981), lowering transaction costs enhances efficiency and competitiveness of a firm. In Obio/Akpor, Small and Medium Enterprises (SMEs) with access to reliable

and affordable energy are better equipped to expand their operations compared to those struggling with high energy costs or inconsistent supply. The theory is relevant in the context of SMEs in Obio/Akpor with respect to how energy availability, cost, and reliability would have an impact on the transaction cost incurred by SMEs. Since energy is a major operating cost for SMEs, businesses are often forced to choose between generating energy internally and relying on external suppliers. The theory suggests that, through minimizing transaction costs such as negotiating with suppliers, managing risks associated with energy, and managing energy use, SMEs can optimize efficiency and competitiveness (Williamson, 1981). To SMEs in Obio/Akpor, available and affordable energy reduces the time lost to operational downtime, reduces the need for costly substitutes like generators, and enhances overall transaction cost efficiency. The theory also added, the research builds a framework to study how the availability of energy influences the decision of SMEs to operate, performance, and long-term viability, providing evidence on how energy-related decision-making can help SMEs save costs and gain a competitive edge in a power-supply volatile area.

2.3 Empirical Review

Udoinyang and Daniel (2024) looked at power supply small and medium scale enterprises in Rivers State, Nigeria. Primary and secondary source of data were the source of data for the study, the study aims at examining the effect of power (electricity) on SMEs, the impact of power supply on the profitability of SMEs and the effect of power (electricity) on the sales and income of SMEs in the state of Rivers. Survey method was employed in this study and Cochran's sample size formula was used as the sampling strategy since the study's population size was limitless thereby leading to a sample size of 384. Power

supply indicators are used as explanatory factors in the models, whereas performance indices are used as dependent variables. Questionnaires were developed by the researchers to get the necessary information from the respondents and the data was analysed using the discrete response approach and the logistic model. The findings of the study showed that SMEs' storage of goods, productivity, and revenue were all negatively impacted by the short duration of public power supply and it serve as a bottle neck that limit the profit, sales and revenue generation of SMEs in Rivers State, Nigeria. Therefore, in order to boost productivity, profitability, and job creation in the state of Rivers, the research suggests that more electric power should be directed to the industrial region of Port Harcourt particularly during the day, money collected from SMEs in form of tax should be wisely put to use for the benefit of the general public. This relates to the current study because it emphasizes the importance of reliable energy for SMEs' operational success and highlights the potential negative effects of energy deficiencies, which SMEs in Obio/Akpor may similarly experience.

Yelwa (2023) analyzed the effect of power supply outages on the productivity and profitability of small and medium enterprises. This research is a cross-sectional survey. A sample of 32 SMEs was selected using a non-probability sampling procedure in the form of purposive sampling techniques. The criteria for selecting the SMEs include their location within the Birnin Kebbi metropolis and electricity use in the business operation. A structured questionnaire was used to collect the data for the study. MRM in the form of OLS was employed. StataCorp 14.0 (2015) was used to analyze the data. The result of the finding reveals that 90.91% of the enterprises studied indicated that power supply outage was the major constrained

to their productivity and profitability, with an average of 180 hours of power outages per month lasting 6 hours per day, causing the enterprises an average of N240,000:00 monthly. This study suggested that there was a need for the Kebbi state authority to establish an independent power plant to bridge the gap from the National grid for improved efficiency of SMEs in the metropolis. This research, using a cross-sectional survey, shows that SMEs face substantial financial losses due to electricity disruptions, which is in line with the current study's focus on how energy availability influences SME performance. Despite the fact that it varies by location, as the study in Obio/Akpor may present different energy challenges, but still supports the broader argument that power issues hinder SME performance.

Ajibola, *et al.*, (2021) examined the impact of electricity on the performance of SMEs in Ado-Odo, Ota LGA, Ogun State. Consequently, the questionnaires were administered to the respondents using the method of purposive sampling. The data was analyzed using Statistical Package for Social Science (SPSS), variance analysis (ANOVA) and Correlations and Ordinary Least Squares (OLS) techniques. A total of 120 questionnaires were distributed, of which 90 were compiled and analyzed. The findings showed that there is significant impact of electricity supply on the performance of SMEs in Ado-Odo Ota Area, in Ogun State. Also, alternative power sources have significant impact on performance of SME in Ado-Odo Ota Area, in Ogun State. Therefore, by and large, from the findings of this study, the paper made the following recommendation for the policymakers and business owners in Ado-Odo, Ota Area of Ogun State in particular, and Nigeria by extension that sufficient supply of electricity should be placed in a place that maximizes the efficiency of small and

medium-sized businesses. In the same vein, SMEs owners should strive to use alternative sources of power to boost the performance of SMEs, and meet their market objectives. This study adds value to the current study because it highlights that alternative energy sources can mitigate power shortages. It also further suggests that SMEs in Obio/Akpor might benefit from similar strategies, considering the increasing reliance on alternative energy in regions with unreliable power supply.

Bassey and Imoh (2021) analyzed the comparative study of the effect of electricity supply on the performance of small and medium-scale enterprises in Calabar South and Calabar Municipality, using small and medium scale businessmen and women as well as power holding company staff. The objectives of this study to analyze the comparative study of the effect of electricity supply on the performance of small and medium-scale enterprises in Calabar South and Calabar Municipality. The survey research design was adopted and a twelve (12) item structured questionnaire was used to obtain a sample size of 248 small and medium scale business owners and power holding staff randomly selected from the population. The results of the study revealed that there is a significant effect of electricity supply on the performance of small and medium-scale enterprises in Calabar South and Calabar Municipality. The results further revealed that insufficient electricity supply significantly affect the performance of small and medium-scale enterprises in Calabar South and Calabar Municipality. The study concludes that there are enormous difficulties being experienced by businesses in Cross River State and other parts of Nigeria due to inadequate and unreliable electric power supply. Thus, an inadequate and unreliable supply of electricity imposes costs and therefore constrained firms' operational

performance as firms suffer high overhead cost due to the deficient electricity supply from the national grid. The study recommends that the Nigerian government needs to consider the issue of power supply reliability very seriously by facilitating both private and public investment in electricity infrastructure. The results from this study show the widespread issues with energy supply in different Nigerian regions. The study displays the necessity of reliable energy access for SMEs in Obio/Akpor, but also suggests the need for infrastructure improvements that the current study could explore further.

Abdulrahman, *et al.*, (2017) determined the impact of electricity service quality on both financial and non-financial performance of manufacturing Small and Medium Enterprises SMEs in Nigeria. Survey questionnaire was used to collect data from 201 Managers, Chief executive officers and owner managers of SMEs that are members of Manufacturers Association of Nigeria MAN. Simple regression analysis was done with the use of SPSS version 22.0. The results indicate that quality of electricity tends to account for more than 50% of the variances in the financial and non-financial performance of manufacturing SMEs in Nigeria. This paper contributes to the existing literature on the empirical investigation into the use of service quality as a measure of electricity service and also emphasizes the importance of electricity to the performance of manufacturing SMEs in the developing countries. It recommends that future research may consider collecting longitudinal data to eliminate bias related to time. This study has provided additional value by emphasizing that not just availability but the quality of electricity also matters. For SMEs in Obio/Akpor, this also suggests that it is not only the presence of power but the consistency and reliability that can significantly impact business outcomes.

3. Methodology

This study adopted a descriptive research design to gather data on existing conditions without manipulation, thereby providing a clear picture of the current situation of SMEs in relation to energy availability. The population of the study comprised 2,634 SME operators in Obio/Akpor Local Government Area of Rivers State, Nigeria, based on local business directories and government records. Five wards, which are Alakahia, Choba, Rumuosi, Ozuoba, and Rumuokoro, were purposively selected due to their high concentration of commercial activities, dense residential settlements, and proximity to major roads, markets, and business hubs, which present unique energy challenges. A simple random sampling technique was employed to ensure representation from this relatively small and homogenous population. The Taro Yamane (1967) formula was used to determine a sample size of 347 respondents, and questionnaires were evenly distributed across the five wards to capture the perspectives of SME owners within the study area.

Both primary and secondary sources of data were employed. Primary data were collected using questionnaires and semi-structured interviews administered to SME operators. The independent variables, reliability of energy supply, energy costs, and availability/accessibility were measured using Likert-scale items developed by the researcher, while SME performance was assessed through financial and non-financial indicators. Construct validity was ensured through adapted items, while reliability was tested using Cronbach's alpha. Interviews, guided by a structured protocol, complemented quantitative data and were thematically analyzed within a convergent mixed-methods design. Secondary data, drawn from reports and publications,

contextualized and triangulated findings without directly measuring constructs. Data analysis involved descriptive statistics to summarize responses, while partial correlation was employed to examine the relationship between energy availability and SME performance, controlling for other relevant factors. Frequency distributions and graphical representations, such as pie charts, illustrated variable patterns. All statistical analyses were conducted using the Statistical Package for the Social Sciences (SPSS, version 24).

4. Results and Discussion

Data Analysis

Out of the total of 347 questionnaires to respondents all were returned.

4.1 Analysis of Respondents' Demography

The demography of the three hundred and forty-seven (347) properly completed questionnaires were shown below:

Table 1 presents the gender distribution of respondents. Out of 347 respondents, 165 (47.55%) were male while 182 (52.45%) were female. Thus, the majority of the respondents were females.

Table 1: Gender

Feature	Frequency	Percentage
Gender		
Male	165	47.55
Female	182	52.45
Total	347	100

Source: Field Survey, 2025

Table 2 shows that seventy-five (75) respondents representing 21.61% of the sample size were of the age group of 18-25, ninety-four (94) respondents representing 27.09% of the sample size were of the age group of 26-35, one hundred (100) respondents representing

28.82% of the sample size were of the age group of 36-45 while seventy-eight (78) respondents representing 22.44% were of the age group of 46 and above. Thus, majority of the respondents were of the age group of 36-45.

Table 2: Age Group

Feature	Frequency	Percentage
Age Group		
18-25	75	21.61
26-35	94	27.09
36-45	100	28.82
46 and above	78	22.46
Total	347	100

Source: Field Survey, 2025

Table 3 shows that Fifty-seven (57) respondents representing 16.63% of the sample size had business situated at Alakahia, seventy-two (72) respondents representing 20.75% of the sample size had business situated at Choba, Sixty-three (63) respondents representing 18.16% of the sample size had business situated at Ozuoba, Eighty (80) respondents representing 23.05% of the

sample size had business situated at Rumuokoro while seventy-five (75) respondents representing 21.61% Sixty-three (63) respondents representing 18.16% of the sample size had business situated at Rumuosi. Thus, majority of the respondents Sixty-three (63) respondents representing 18.16% of the sample size had business situated at Rumuokoro.

Table 3: Age Group

Feature	Frequency	Percentage
Area business is located		
Alakahia	57	16.63
Choba	72	20.75
Ozuoba	63	18.16
Rumuokoro	80	23.05
Rumuosi	75	21.61
Total	347	100

Source: Field Survey, 2025

Table 4 shows that one hundred and twenty-two (122) respondents representing 35.16% of the sample size had businesses that are categorized as manufacturing business, one hundred and fifty-seven (157) respondents representing 45.24% had business that are categorized

as retail business while sixty-eight (68) respondents representing 19.60% had business that are categorized as service businesses. Thus, majority of the respondents had business that are categorized as service businesses.

Table 4: Type of Business

Feature	Code	Frequency	Percentage
Type of Business			
Manufacturing	1	122	35.16
Retail	2	157	45.24
Service	3	68	19.60
Total		347	100

Source: Field Survey, 2025

Table 5 above shows that fifty-six (56) respondents representing 16.14% of the sample size had been in business for less than a year, one hundred and forty-six (146) respondents representing 42.07% of the sample size had been in business between 1 to 3 years, eighty-one (81)

respondents representing 23.34% of the sample size had been in business between 4 to 6 years while sixty-four (64) respondents representing 18.44% had been in business for more than 6 years. Thus, majority of the respondents had been in business between 1 to 3 years.

Table 5: How long have your business operated?

Feature	Code	Frequency	Percentage
How long have your business operated			
Less than a year		56	16.14
1-3 years	1	146	42.07
4-6 years	2	81	23.34
More than 6 years		64	18.44
Total		347	100

Source: Field Survey, 2025

4.2 Interpreting the Research Questions

The descriptive statistics in Table 6 show that the respondents' perception of reliability of energy supply had a mean score of 2.93 (SD = 1.40) on a 5-point scale, indicating that, on average, SMEs experienced low to moderate reliability of electricity supply. Energy costs had the highest mean score of 3.11 (SD = 1.49), suggesting that most SMEs perceived energy expenses as moderately high relative to their operations. The mean score for availability and accessibility of energy was 2.95 (SD = 1.41), reflecting

limited but fairly accessible energy options for SMEs in the study area. Finally, the dependent variable, SME performance, had a mean score of 2.93 (SD = 1.44), implying that performance levels were generally average, influenced by the challenges of energy supply and costs. The standard deviations (ranging from 1.40 to 1.49) show moderate variability in responses, suggesting that while some SMEs reported favorable experiences, others reported significant challenges in energy availability and performance outcomes.

Table 6: Descriptive Statistics of Study

	N	Minimum	Maximum	Mean	Std. Deviation
Reliability of Energy Supply	347	1	5	2.93	1.40
Energy Costs	347	1	5	3.11	1.49
Availability and Accessibility	347	1	5	2.95	1.41
SME Performance	347	1	5	2.93	1.44
Valid N (listwise)	347				

Source: SPSS Output

The regression model including all predictors (reliability of energy supply, energy costs, and availability/accessibility) explained 50.0%

of the variance in SME performance ($R^2 = .500$, Adjusted $R^2 = .485$, $F(3,343) = 105.41$, $p < .001$), indicating a good model fit (see Table 1).

Table 1: Model Summary and ANOVA of the Regression Model

Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate	F	Sig.
1	.707	.500	.485		2.555	105.41	.000

Source: SPSS Output

Regression Analysis of Predictors

As shown in Table 2, the regression coefficients revealed that energy cost ($\beta = .298$, $t = 5.870$, $p < .001$) and energy availability & accessibility ($\beta = .262$, $t =$

4.840, $p < .001$) had significant positive effects on SME performance. In contrast, reliability of energy supply ($\beta = .084$, $t = 1.616$, $p = .107$) was not statistically significant at the 5% level.

Table 2: Regression Analysis of Energy Variables and SME Performance

Predictor	B	Std. Error	Beta	t	Sig.
(Constant)	9.199	.893	—	10.298	.000
Reliability on Energy	.076	.047	.084	1.616	.107
Energy Cost	.317	.054	.298	5.870	.000
Energy Availability & Accessibility	.255	.053	.262	4.840	.000

Dependent Variable: SME Performance

Source: SPSS Output

Discussion of Findings, Conclusion, and Recommendations

Discussion of Findings

The regression results revealed varying effects of the independent variables, reliability of energy supply, energy cost, and energy availability/accessibility on SME performance in Obio/Akpor Local Government Area.

The findings showed that reliability of energy supply had no statistically significant effect on SME performance ($\beta = .084$, $p = .107$). This suggests that while outages remain a challenge, SMEs in Obio/Akpor may have adopted coping strategies, such as reliance on generators or alternative energy sources, which weaken the direct impact of reliability on performance outcomes. This finding diverges from the work of Udoinyang and Daniel (2024) and Yelwa (2023), who both reported that poor and unreliable power supply significantly constrained SMEs' productivity, sales, and profitability. However, it aligns partially with Ajibola et al. (2021), who emphasized the importance of alternative energy in mitigating power shortages. The contrast indicates that SMEs in Obio/Akpor may be less dependent on grid reliability compared to SMEs in other regions, likely due to increased adaptation to alternative power solutions.

The analysis showed that energy cost had the strongest positive and statistically significant impact on SME performance ($\beta = .298$, $p < .001$). This implies that the affordability of energy remains a critical determinant of business efficiency, as rising energy expenses directly influence production costs, pricing, and profitability. This result is consistent with the findings of Bassey and Imoh (2021), who reported that high overhead costs resulting from poor electricity supply hinder SME growth. It also aligns with Abdulrahman et al. (2017), who demonstrated that electricity service quality, which often translates into cost

implications, explained a significant proportion of SME performance in Nigeria. The confirmation across these studies underscores that for SMEs in Obio/Akpor, managing energy costs is essential for sustaining operations and competitiveness.

Energy availability and accessibility were also found to significantly influence SME performance ($\beta = .262$, $p < .001$). This finding highlights that beyond cost, the mere ability to access sufficient energy resources determines SMEs' capacity to operate efficiently. The result confirms the conclusions of Ajibola et al. (2021), who found that access to alternative energy improved SME performance, as well as Bassey and Imoh (2021), who showed that inadequate electricity supply constrained SMEs in Cross River State. Similarly, Udoinyang and Daniel (2024) stressed that shortfalls in electricity availability directly reduced SMEs' productivity and revenues in Rivers State. Therefore, the present study reinforces the argument that energy availability is a key enabler of SME performance across Nigerian regions.

The findings from the study suggest that while energy cost and availability are critical determinants of SME performance in Obio/Akpor, reliability of supply was not significant, contrary to several prior studies. This discrepancy may be explained by contextual differences in adaptation strategies, as SMEs in Obio/Akpor appear to have developed resilience mechanisms against unreliable power. Nonetheless, the findings confirm the broader literature that emphasizes the centrality of energy access and affordability to SME performance in Nigeria.

5. Conclusion and Recommendation

This study examined the effect of energy reliability, cost, and availability on the performance of SMEs in Obio/Akpor Local Government Area. The regression

analysis revealed that energy cost and availability/accessibility are significant determinants of SME performance, while reliability of energy supply was not statistically significant. The insignificance of energy reliability suggests that SMEs in Obio/Akpor may have developed resilience through alternative energy sources, reducing their dependence on the stability of public power supply. The findings highlight that managing energy costs is crucial for sustaining competitiveness, as high energy expenses directly affect profitability and efficiency. Furthermore, the ability to access sufficient and affordable energy remains essential for enabling SMEs to operate effectively. These results align with previous studies that emphasize the importance of energy affordability and accessibility, although they diverge from literature that consistently stresses the critical role of reliability. The study therefore, concludes that energy cost and availability are the major drivers of SME performance in Obio/Akpor, while reliability plays a less prominent role due to adaptive strategies by business owners. This underscores the need for policy interventions that focus on reducing energy costs and improving access to stable power, while also supporting SMEs in exploring sustainable alternative energy solutions.

Recommendation

Based on the findings of this study, it is recommended that policymakers and relevant stakeholders prioritize improving energy availability and reducing energy costs to foster the growth and performance of SMEs in Obio/Akpor. Targeted investments should be directed toward expanding access to affordable energy sources, while also creating mechanisms such as subsidies or incentives to ease the burden of high energy costs on small businesses. Although the study revealed that energy reliability was not statistically significant,

it remains an important complementary factor that can enhance the benefits of improved availability and affordability. Efforts to stabilize power supply, alongside initiatives promoting alternative energy solutions, would further strengthen the operating environment of SMEs. By ensuring that SMEs have access to cost-effective and readily available energy, government and stakeholders can create a more enabling business climate that enhances productivity, supports entrepreneurship, and contributes to sustainable economic growth in the region.

References

- Abdulrahman M., Issa, A., & Ismaila, Y., (2017). Impact of electricity service quality on the performance of manufacturing SMEs in Nigeria. *Journal of Business and Social Review in Emerging Economies*, (3)1, 1-10.
- Aderemi, T. A., Efunbajo, S. A., Amusa, B. O., & Rasheed, O. I., (2020). Does entrepreneurship financing contribute to poverty eradication in Nigeria? Evidence from Small and Medium Scale Enterprises. *Journal of Academic Research in Economics*, 12(2), 312-322.
- Afolabi, M. O. (2013). Growth effect of small and medium enterprises (SMEs) Financing in Nigeria. *Journal of African Microeconomic Review*, 12(1) 11-21.
- Ahmed, N. O., Fagorite, V. I., Chikwado, A. G., Apata, D. M., Yunusa, L. J., Itiveh, E. S., & Biliaminu, Z. B. (2024). Pollution assessment and index properties of Okpolor soils, Rivers State, Nigeria: geochemical characterization, geotechnical and geoenvironmental implications. *Discover Environment*, 2(1), 60.

- Ajibola, A.A., Sodeinde, G. M., Aderemi, T. A., & Yusuf, M. O. (2021). Impact of electricity supply on the performance of small and medium-scale enterprises (SMEs) in Nigeria: A Case Study. *Economic Insights – Trends and Challenge*, 10(4),11-21.
- Arumdeben, G., Rimamnde, R., & Wajim, A. S. (2023). Effect of electricity distribution on small and medium enterprises (smes) performance in Southern-Taraba State. *Academic Journal*, 12-12.
- Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-120.
- Barney, J. B. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99-121.
- Bassey, C. E., & Imoh, I. K. (2021). The effect of electricity supply on the performance of small and medium-scale enterprises in Nigeria: A case study of Calabar South and Calabar Municipality of Cross River State. *International Journal of Engineering and Management Research*, 11(4), 68-78.
- Chad, O., 2018. Forbes (October 25) Retrieved from forbes finance council: [https://www. forbes. com/sites/forbes-personal-shopper/2020/09/10/best-kitchen-scales according-toexperts/#5c4c5a122060](https://www.forbes.com/sites/forbes-personal-shopper/2020/09/10/best-kitchen-scales-according-toexperts/#5c4c5a122060)
- Coase, R. H. (1937). The nature of the firm. *Economica*, 4(16), 386-405.
- de Camargo Fiorini, P., Seles, B. M. R. P., Jabbour, C. J. C., Mariano, E. B., & de Sousa Jabbour, A. B. L. (2018). Management theory and big data literature: From a review to a research agenda. *International Journal of Information Management*, 43, 112-129.
- Dierickx, I., & Cool, K. (1989). Asset stock accumulation and sustainability of competitive advantage. *Management science*, 35(12), 1504-1511.
- Emovon, F. O., Atu, O. E. O., & Agbo, I. S. (2023). Small Scale Enterprises; Challenges and Prospects in Benin City, Nigeria. *Journal of Global Accounting*, 9(3), 155-181.
- Esuh, O. L., & Adebayo, I. O. (2012). Is small and medium enterprises (SMEs) an entrepreneurship? *International Journal of Academic Research in Business and Social Sciences*, 2(1).487-496.
- Fabunmi, B .C (2004). Small and medium scale industries Nigeria: *Problems, prospects and management techniques. (2nd ed.)*. Akure, JBS Printing and Publishing.
- Gąsior, A., Grabowski, J., Ropega, J., & Walecka, A. (2022). Creating a competitive advantage for micro and small enterprises based on eco-innovation as a determinant of the energy efficiency of the economy. *Energies*, 15(19), 6965.
- Henriques, J., & Catarino, J. (2016). Motivating towards energy efficiency in small and medium enterprises. *Journal of Cleaner Production*, 139, 42-50.
- Ibitomi, T., Dada, D. A., Ayedogbon, J. O., Micah, M. E. E., & Aderotimi, B. (2024). Small and medium scale enterprises and economic growth in Nigeria. *Journal of Social Sciences and Management Studies*, 3(2), 26–45.
- Lippman, S. A., & Rumelt, R. P. (1982). Uncertain imitability: An analysis of interfirm differences in efficiency under competition. *The bell journal of Economics*, 418-438.
- Madhani, P. M. (2010). The resource - based view (RBV): issues and perspectives. *PACE, a journal of*

- research of Prestige institute of Management, 1(1), 43-55.
- Mahoney, J. T., & Pandian, J. R. (1992). The resource-based view within the conversation of strategic management. *Strategic management journal*, 13(5), 363-380.
- Obitayo, K.M. (2001). Creating and enabling environment for small scale industries. *Bullion publication of CBN*, 25 (3), 116-127.
- Peteraf, M. A. (1993). The cornerstones of competitive advantage: a resource-based view. *Strategic management journal*, 14(3), 179-191.
- Phan, T. H. (2022). Working conditions, export decisions, and firm constraints-evidence from vietnamese small and medium enterprises. *Sustainability*, 14(13), 7541.
- PricewaterhouseCoopers (PwC). (2024). *PwC MSME Survey Report 2024*. Retrieved from <https://www.pwc.com/ng/en/assets/pdf/pwc-msme-survey-report-2024.pdf>
- Small and Medium Industry Equity Investment Scheme (2015). Statistical Report bulletins for 2015.
- Soludo, C. (2005) impact of small and medium scale enterprises on the Nigerian economy. *International Journal of management*, 2(3), 26-28.
- Udoinyang, N. & Daniel, R. (2024). Power supply and the performance of small and medium scale enterprises in Rivers state, Nigeria. *Journal of Economics, Innovative Management, and Entrepreneurship*, 2(1), 53-65.
- Udoinyang, N. U. N., & Udoinyang, N. U. N. (2023). Power supply and the performance of small and medium scale enterprises in Rivers State, Nigeria. *Psocialsciences*, 3(2), 80-99.
- Uyanik, M. (2023). Resource-based view in marketing literature. *Journal of Business and Management Studies*, 5(4), 29-39.
- Williamson, O. E. (1981). The economics of organization: The transaction cost approach. *American Journal of Sociology*, 87(3), 548-577.
- World Bank, (2018). World Development Indicators. Washington D. C. Retrieved from <http://data.worldbank.org/data-catalog/world-developmentindicators>.
- Yamane, T. (1967). *Statistics: An introductory analysis. 2nd Edition*, Harper and Row, New York.
- Yelwa, M. A. (2023). Assessment of the effect of power supply outage on small and medium enterprises performance (a case of metal fabrication in Birnin Kebbi Metropolis). *Sospoly Journal of Engineering, Entrepreneurship & Environmental Studies*, 5(1),1-14.