

Power Outages and the Performance of Small and Medium Scale Enterprises (SMEs) in Ekiti State, Nigeria

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Abstract

This study was carried out to examine the effects of power outages on the performance of SMEs in Ekiti State, Nigeria. The study was carried out in Ado-Ekiti, the state capital. Data were collected through the use of questionnaire, copies of which were administered to 114 SMEs in the study area. The findings show that on average, SMEs in the study area had access to electricity for about two days weekly, and it was only stable for between 1 hour and 5 hours daily. Similarly, the average monthly cost of electricity from the national grid was between about ₦5000 and ₦10,000, while it costs SMEs between ₦30,000 and ₦90,000 monthly on average to fuel alternative electricity generators. The effect of power outages is negative on SMEs' turnover. The study recommends that the government needs to provide palliatives to SMEs that would help reduce the burden of the power outage on the SMEs' operations. This can be done through giving them tax incentives or subsidies.

Keywords: SMEs, Power Outages, Ado-Ekiti, SMEs' Performance.

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Introduction

The issue of insecurity and its resolution is one of the problems facing the modern world. Despite the fact that there are many factors that contribute to insecurity, unemployment— particularly among young people— stands out. A nation's unemployment is the cause of its other vices. Insecurity is the result of violent behaviour that arises from problems like unemployment and poverty, among other things, claim Ajodo-Adebanjoko and Okorie (2014). When people lack the essentials of life and are not working for a living, they draw attention to their situation by acting destructively at the first sign of trouble. One effective approach for addressing a country's insecurity problem is tackling of unemployment. Therefore, one of the main goals of any government is to achieve full employment. Promoting small and medium-sized businesses (SMEs) has been suggested as one way to address unemployment, particularly in developing nations (Aremu & Adeyemi, 2011; Zainea et al., 2020). It is impossible to overstate the importance of small and medium-sized businesses to the general expansion and advancement of an economy. In any economy, it offers enormous potentials for income growth and job creation. The fact that SMEs make up almost 95% of all businesses in the Organisation for Economic Cooperation and Development (OECD) nations shows how important they are to the global economy (OECD, 2019). It has been discovered that SMEs are resilient to the shocks of economic crises in terms of creating jobs (International Labour Office (ILO), 2015). SMEs are thought to account for more than 60% of employment in OECD nations (OECD, 2019). The growth of SMEs can also aid in economic diversification and offer a fresh avenue for an economy that is resilient to shocks (OECD, 2019). However, there are numerous obstacles to SMEs' growth, particularly in developing nations. These consist of insufficient long-term capital funding, bad management techniques, a lack of entrepreneurial ability, an unfavorable tariff policy, and infrastructure flaws like irregular power supplies. In general, an unstable power source reduces an organisation's ability to produce.

It is especially severe for SMEs since they cannot afford and maintain alternative electric power sources. The efficient operation of SMEs is impacted by unstable electrical supplies, which leads to output not occurring on schedule. As a result, frequent power outages eventually cause production

to drop, which prevents SMEs from meeting their sales targets. Because SMEs cannot match customer demand, a decrease in sales volume results in a decrease in business income. SMEs are therefore compelled to adopt alternate power sources, such as standby electrical generators, in order to safeguard their companies and prevent a continuous decline in productivity (Maleko, 2005). Additionally, they frequently put in extra hours to make up for lost output. Utilising alternate electricity sources has the unintended consequence of raising manufacturing costs, which has a detrimental impact on SMEs' profitability.

SMEs are crucial to Nigeria's economic activity, making significant contributions to both the GDP and job creation of the nation. According to Ademola and Michael (2012), small and medium-sized businesses (SMEs) are crucial to the creation of jobs in Nigeria. Like in other emerging nations, the country's unstable electrical supply has posed a significant obstacle to the growth of SMEs. The severe lack of energy in Nigeria has persisted for many years (Somoye, 2023). Because of the power outage, the bulk of Nigerians are reliant on other sources of electricity. Businesses' operations, particularly those of the nation's SMEs, have suffered as a result.

According to Olatunji (2019), one of the issues influencing the performance of SMEs in Nigeria is the expense of providing alternate electricity to them. Furthermore, a lot of businesses have closed their factories because of the high operating costs associated with using generators to power their offices and plants. The emissions produced by alternative power generating equipment are typically harmful to human health. One of the poorest states in the nation, Ekiti is home to a large number of small and medium-sized enterprises (SMEs) and lacks heavy industries. Because of the high frequency of power outages in the state, it is necessary to investigate the impact of power outages on the performance of SMEs in Ekiti State (Adeoye et al., 2023). The following section provides an overview of the electricity situation and SMEs in Ekiti State.

Overview of Electricity Situation and SMEs in Ekiti State

The southwest region of Nigeria is home to Ekiti State, one of the states established on October 1, 1996, with Ado-Ekiti as its capital (Olubusola et al., 2022). From the former Ondo State, the state was separated. The state

is made up of sixteen local government areas. The state is credited with producing the highest number of academics in Nigeria, and many of the country's pioneering professors in a variety of fields were from the state (Bakare et al., 2014). In spite of this, the state has struggled with an infrastructure deficit ever since it was established. The issue of an unpredictable power source is one among them. It has been determined that the state's lone transmission station, which is 132KV, is woefully insufficient (Olusuyi et al., 2014). As a result, the state has a high rate of unstable electricity supply. For example, Olusuyi et al. (2014) calculated that in 2009, Adebayo, Ajilosun, and Bashiri, business areas in the state capital, received 2296, 2891, and 2932 hours of steady electricity supply, respectively. The three areas are the business areas of the state capital. This translates to 95 days, 120 days, and 122 days of consistent electricity throughout the year. In a related study, Adeoye and Titiloye (2014) calculated that Adebayo received 1820 hours of energy in 2012, which equates to 75 days of the year.

SME has made a significant contribution to the growth of the state's economy. As of 2013, Ekiti State had 903 small businesses, 126 medium-sized businesses, and 964,179 microenterprises, according to SMEDAN/ National Bureau of Statistics (2013). According to Opafunso and Adepoju (2014), the number of SMEs in the state increased by 57% between 2006 and 2013. According to reports, microenterprises created approximately 1,440,771 jobs in the state as of 2013, compared to 38,483 jobs created by small and medium-sized businesses during the same time frame. Access to reliable electricity will be crucial if the state is to fully grasp the potential that SMEs provide.

Understanding the Concepts of SMEs

Despite countless attempts, there is still no widely accepted definition of SMEs. Different countries or institutions have different definitions or classifications for small and medium-sized businesses. Generally, SMEs are divided into various groups based on factors like capital expenditure, personnel count, turnover, etc. Small businesses are generally divided into three groups. These are micro, small, and medium-sized businesses. For example, in Indonesia, businesses with net assets less than IDR 50 million or with annual revenues up to IDR 300 million are classified as

microbusinesses; businesses with net assets between IDR 50 million and IDR 500 million or with annual revenue between IDR 300 million and IDR 2.5 billion are classified as small businesses; and businesses with net assets between IDR 500 million and IDR 10 billion or with annual revenue between IDR 2.5 billion and IDR 50 billion are classified as medium businesses (Bellefleur et al., 2012). The ILO (2015) classified SMEs based on the employment generated by each business. Businesses that employ ten people or less are categorised as microenterprises; those that employ ten to one hundred people are categorised as small businesses, and businesses that employ one hundred to two hundred people are categorised as medium businesses. Both asset values and employment generation were used in Nigeria by SMEDAN/NBS (2013). Businesses with fewer than ten employees or assets under ₦5 million are categorised as microenterprises; those with 10 to 49 employees or assets over ₦5 million but below ₦50 million are categorised as small enterprises; and those with 50 to 199 employees or assets under ₦50 million but below ₦500 million are categorised as medium enterprises. This definition was used in this investigation.

Review of Some Literature

The effect of power outages on the operations of small and medium-sized businesses (SMEs) has been the subject of numerous studies. For example, Cissokho and Seck (2013) discovered that power interruptions raise operational expenses and decrease productivity for SMEs in Senegal because of their reliance on costly alternative power sources such as diesel generators. Similar results were found in Ghana by Braimah and Amponsah (2012), who demonstrated that an unstable electricity supply causes large financial losses, especially for energy-intensive companies. Nyanzu and Adarkwah (2016) pointed out that frequent power outages cause SMEs in Ghana to produce less, which results in missed deadlines and lost income. Additionally, Doe and Emmanuel (2014) noted that power interruptions have a detrimental effect on customer satisfaction and loyalty by interfering with production schedules and supply chain management. Similar findings were made by Ekpo et al. (2022), who discovered that unscheduled power outages frequently cause delays and force SMEs to operate below capacity,

reducing their ability to compete in the market. According to Smith et al. (2022), businesses that depend on constant energy input, such as those in the food processing or textile industries, are disproportionately impacted by power outages. Also, Mabuza and Maphosa (2023) argued that when refrigeration and electronic payment systems malfunction during outages, service-oriented SMEs, such as retail establishments, incur losses,

In the case of Owusu et al. (2022), the impact of power outages varies by area, and rural SMEs face more difficulties than their urban counterparts since they have less access to alternative power sources. According to Cissokho (2019), regulatory changes intended to increase grid reliability have lessened some of the effects in cities while leaving rural businesses behind. Persistent outages, according to Olajuyin and Mago (2022), cause SMEs to stagnate or even close since owners are unable to reinvest their income. Also, Akuru and Okoro (2014) argued that the decrease in Nigerian SMEs' creativity and competitiveness in international markets are caused by an unreliable power supply. The reviewed studies emphasise how SMEs are severely hampered by power outages, which have an impact on long-term sustainability, profitability, and production. This study further expands knowledge in this area by examining the effect of power outage on the performance of SMEs in Ekiti State.

Research Method

Research Design

This study adopted survey research design. This is the type of research design in which a survey is administered to a selected sample in a population or to the entire population. In this case, a selected sample was used as representative of the population.

Study Population

The target population in this study is the SMEs in Ekiti State. Unfortunately, there is no accurate data on the number of SMEs in the state. SMEs are scattered across the breadth and length of the state, but they are mostly concentrated in the state capital, Ado Ekiti. With this in mind, this study was carried out in Ado Ekiti.

Sample Size

As a result of lack of data to determine the actual population size of this study, Singh, and Masuku (2014) showed that for population size that is over 100,000, a sample size of 100 is ideal. Hence, the sample size was chosen as 140. This was to choose samples that represent the population well enough. After the survey, only 125 copies of the questionnaire were completed and retrieved, out of which only 114 were found to be valid for the analysis.

Sampling Technique

A stratified sampling technique was used to divide the study area into identified areas using already established streets and areas in the town. A random sampling technique was employed to ensure a fair selection of SMEs for the survey.

Research Instruments

The instrument used in the collection and gathering of the data is the questionnaire. Copies of the questionnaire were administered to the owners of SMEs.

Analytical Framework

The aim of this study is to examine the effects of power outages on SMEs in Ekiti State. To achieve this, two methods were used. The first one addresses the effects of power outages on the performance of SMEs, while the second was used to calculate the cost of power outages. For the first one, Ordinary Least Square Regression Technique was employed, while for the second one, descriptive analysis was used to calculate the average cost of alternative power on daily basis. This was compared to the daily profit to determine its effect in the business.

The Model

In order to determine the effects of power outages on the performance of SMEs, the model used by Ishengoma and Kappel (2011) was adopted. This is presented in equation 1:

$$SMEPER_t = \delta_0 + \delta_1 POWER_t + \delta_2 SUPPLY_t + \delta_3 Years_t + \delta_4 EMPLOYEE_t + \delta_5 Gen_t + e_t \dots\dots(1)$$

Where: SMEPER is log SME performance proxied by monthly turnover, POWER is No of days with total power outage in a week, used as proxy for power outage, SUPPLY is Hours of electricity supply daily, Years is Years in Business, EMPLOYEE is no of employees, GEN is the daily expenditure on fuel for alternative generator. All the variables are in log form.

The Results

This section presents the analysis of data collected from the administered questionnaires. It begins with descriptive analysis, which is followed by the regression analysis.

Categories OF SMEs

Based on the classification of SMEs discussed in above, we classify the SMEs into three categories as shown in Table 1. The result shows that most of the SMEs are microenterprises. This is followed by small enterprises, while the remaining could be classified as medium enterprises.

Table 1 Categories of SMEs

Business	Frequency	Percentage
Micro	75	65.8
Small	34	29.8
Medium	5	4.4
Total	114	100.0

Source: Author's computation from the survey

Average Monthly Sales of Respondent SME Firms

Table 2 shows that most of the respondents (41.2%) made average sales of less than ₦20, 000 monthly. These are the SMEs classified as Microenterprises. A substantial percentage (40%) of the respondents also make more than ₦60,000 monthly, on average. This means that with erratic power supply, their profit could be affected given the increased cost of operation.

Table 2. Average Monthly Sales of Respondent SME Firms

Amount	Frequency	Percent
Less than 20,000	47	41.2
20,000- 40,000	15	13.2
40,001- 60,000	6	5.3
Above 60,000	46	40.4
Total	114	100.0

Source: Author’s computation from the survey

Average Minimum Hours of Electricity Required Daily

The average minimum number of electricity/power required by the SMEs on daily basis is presented in Table 3. On average, most of the respondents said they needed an average supply of electricity of more than 12 hours per day. None of the enterprises required daily supply of electricity of less than 3 hours. We compare this with daily electricity supply by the Benin Electricity Distribution Company (BEDC), the electricity distribution company that is in charge of distributing electricity to Ekiti State. This is presented in Table 5.

Table 3: Average Minimum Hours of Electricity Required Daily

	Frequency	Percentage
Between 3hrs and 5hrs	10	8.8
Between 6hrs and 8hrs	21	18.4
Between 9hrs and 12hrs	36	31.6
More than 12hrs	47	41.2
Total	114	100

Source: Author’s computation from the survey

Average Hours of Electricity Supplied Daily

Table 4 shows the average daily electricity supplied from the national grid, as reported by the respondents. Only 10.5% reported an average electricity of between 6 to 8 hours daily. This is even less than the required electricity supply of about 12 hours minimum. Most of the respondents reported an

average electricity supply of between one and two hours per day. This means that the remaining 10 hours are supplied through alternative power sources like generators or inverters. This translates to an average dependence on alternative power sources of about 300 hours monthly. This constitutes high cost of production for the SME.

Table 4: Average Hours of Electricity Supplied Daily

	Frequency	Percent
Valid None	5	4.4
Between 1hr and 2hr	52	45.6
Between 3hrs and 5hrs	45	39.5
Between 6hrs and 8hrs	12	10.5
Total	114	100.0

Source: Author’s computation from the survey

Average Monthly Electricity Bill

Table 5 shows the average monthly bill paid by the respondents to BEDC. Most of the respondents pay an average monthly electricity bill of about ₦5000. This is followed by the proportion of respondents who paid between ₦5000 and ₦10000 monthly to BEDC. This is despite the erratic power supply

Table 5: Average Monthly Electricity Bill

	Frequency	Percent	Valid Percent	Cumulative Percent
5000 and Below	70	61.4	61.4	61.4
5001 to 10000	33	28.9	28.9	90.4
10001 to 15000	7	6.1	6.1	96.5
15001 to 20000	4	3.5	3.5	100.0
Total	114	100.0	100.0	

Source: Author’s computation from the survey

Days without Power Supply

The respondents were also asked if there are days without power supply from BEDC. The result shows that there are days without the supply of electricity from the BEDC. However, this does not reduce their monthly bill.

Table 6: Days without Electricity Supply

	Frequency	Percentage
Yes	105	92.1
No	9	7.9
Total	114	96.5

Source: Author's computation from the survey

Number of SMEs with Alternative Source of Power

Figure 1 shows that about 92.1% of the enterprises have alternative sources of power, while 7.9% do not. This shows the heavy dependence of the enterprises on alternative power source.

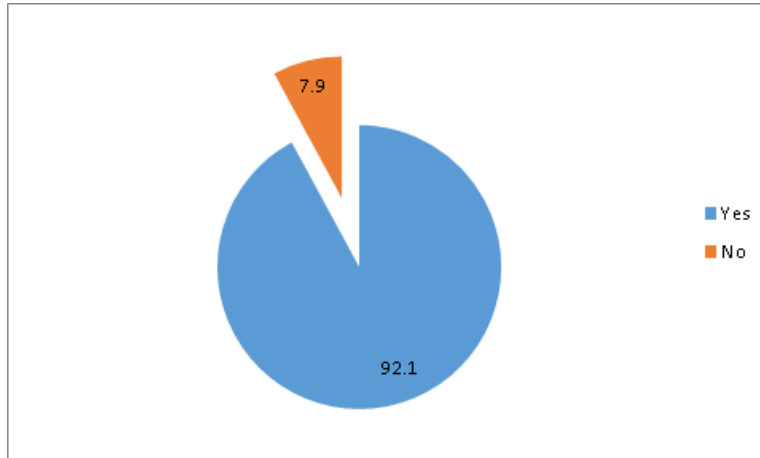


Figure 1: Availability of alternative source of power

Number of Days in a Week without Power Supply

Following the response in previous section, the respondents were also asked the number of days in a week without power supply. Majority of the respondents (52.6%) said two days on weekly basis. About 28.1% also said average of three days weekly, while insignificant proportion said average of six days or seven days weekly. This is shown in Table 7

Table 7: Average Days in a Week without Power

	Frequency	Percent
One day	15	13.2
Two days	60	52.6
Three days	32	28.1
Four days	4	3.5
Five days	1	.9
Six days	1	.9
Seven days	1	.9
Total	114	100

Source: Author's computation from the survey

Average Cost of Daily Use of Petrol for Alternative Power Source

Table 8 shows the average daily consumption of petrol for alternative power purpose. About 24.6% of the enterprises spent average of ₦1000 daily on fuelling. 51.8% spent between ₦1,000 and ₦3,000 per day on buying fuel. This means that on the average, they spend between ₦30,000 and ₦90,000 monthly on fuelling other source of power supply like generators. This means on average, an enterprise who makes average income of ₦60,000 monthly spends almost half of the monthly turnover on providing other sources of power. This, no doubt, is not sustainable in the long run.

Table 8: Average Daily Use of Petrol for Alternative Power Source

	Frequency	Percentage
1000 and below	28	24.6
1001 and 3000	59	51.8
3001 and 5000	23	20.2
Above 5000	4	3.5
Total	114	100.0

Source: Author's computation from the survey

Effects on Production Process

The respondents were asked if they have ever stopped working or producing as a result of a power outage, the result shows that about 67.5% have had a situation that requires that they stop their production or sales as a result of a power outage.

Table 9: Effect on Production Process

	Frequency	Percent
Yes	67	67.5
No	37	32.5
Total	104	91.2

Source: Author's computation from the survey

Perceived Effects of Power Outage on the SMEs' Growth

The perception of the respondents on the effects of power outages is presented in Table 10. It shows that all the respondents agreed that power outages have affected them, though at different level. Most of the respondents agreed that it has affected them severely. This shows that the respondents are aware of the effects of power outages on their businesses.

Table 10: Perceived Effects of power outage on the SMEs growth

	Frequency	Percentage
Very little extent	15	13.2
Little extent	25	21.9
Some extent	26	22.8
Great extent	15	13.2
Very great extent	34	29.8
Total	114	100

Source: Author’s computation from the survey

Most Worrisome Challenges Facing SMEs

They were also asked to state the most worrisome challenges in their business. Electricity is the most worrisome challenge facing the growth of SMEs in the study area. Ironically, this is followed by customer satisfaction, while sourcing for raw materials is the third. This is shown in Table 11

Table 11: Most Worrisome Challenges Facing SMEs

	Frequency	Percent
Electricity	55	48.2
Raw materials	15	13.2
Customer satisfaction	28	24.6
Regular supply of Goods	8	7.0
Capital	8	7.0
Total	114	100

Source: Author’s computation from the survey

Effects of Power Outage on SMEs’ Monthly Turnover

The relative effect of power outage on the SMEs on the monthly turnover was assessed using OLS regression model discussed in the previous section. Monthly turnover was used as proxy for SMEs’ performance, No of days with total power outages in a week was used as a proxy for power outages,

and other variables like number of employees, years in business, were used as control variables. The level of significance of each variable was tested using the T-test, while the overall significance of the model was assessed through F-Test. The result is presented in Table 12.

The result shows that hours of electricity supplied by BEDC is significant in determining monthly turnover of the SMEs in the study area. It is also positive in line with expected sign. This shows that a 1% increase in hours of electricity increases the monthly turnover by 0.5%. The implication of this is that if SMEs have more supply of electricity, their turnover will increase. Also, Years in business has a significant positive relationship with the monthly turnover. This shows that the more the enterprises stay in business, all other things been equal, the more their turnover would increase. An explanation of this could be that the more they stay in business, the more loyal customers they have, and the more their turnover.

Also, the longer they stay in the business, the more they understand the business, and the more they are able to position themselves for better turnover. Number of employees also has a significant and positive relationship with monthly turnover. An explanation of this is that the more the number of employees, the less the turn-around time, and the more customer loyalty the businesses have. This will eventually increase the turnover.

However, power outage has a negative relationship with monthly turnover. An increase in the number of days without power supply reduces the monthly turnover of the SMEs. This is however not significant. An explanation for this is that, overtime, enterprises have grown a passive behaviour towards power outages because they believe it to be a normal situation. In other words, they have formed an expectation about the power outages. They have alternative electricity sources which they rely on, and thus rely less on electricity supplied from the national grid. Given this, they factor it as part of their prices. Hence, it is no longer significant.

The F test was used to test the joint significance of the variables. The null hypothesis tested was that all coefficients were simultaneously equal to zero. The result shows that we reject the null hypothesis at 1% level of significance. Hence, all the variables are jointly significant in explaining variation in the maximum monthly turnover of the SMEs. The result also shows that the model is reliable as given by the R squared of 0.299, which

means 30% of the variation in monthly turnover was explained in the model. The DW is low but it is still between the critical value of $1.5 < d < 2.5$. Therefore, we can assume that there is no first-order linear autocorrelation.

Table 12: Regression Results on the Effects of Power Outage
Dependent variable: Log of Monthly Turnover

Variables	Coefficient	Standard Error	T-Statistics	P-Value
Constant	-5.363	92167.364	-1.781*	0.078
Log of Hours of electricity supply	0.527	0.125	4.230***	0.000
Log of No of days with total power outage in a week	-0.489	0.361	-1.352	0.179
Log of Years in Business	0.864	0.363	2.382**	0.019
Log of No of Employees	0.452	0.126	3.584***	0.001
Log of Fuel Cost of Generator	-0.026	0.227	-0.113	0.910
F-statics = 8.628 P-value = 0.000-				
R-Square: 0.299 Durbin-Watson = 1.68				

Summary of Main Findings

The findings show that on average, SMEs in the study area had access to electricity for about two days weekly, and it was only stable for between 1 hour and 5 hours daily. Similarly, the average monthly cost of electricity from national grid was between about ₦5000 and ₦10, 000, while it costs SMEs an average of ₦30,000 to ₦90,000 monthly to fuel alternative electricity generators. This shows that the cost of maintaining alternative electricity power is on average three times the cost of electricity from national grid. It also shows that the cost of maintaining alternative power sources takes a substantial proportion of the SMEs’ turnover.

More so, microenterprises may not be able to use alternative electricity as much as they need it. The effect of power outages is negative on SMEs' turnover, but it was not significant. The reason for this cannot be far from the dependence on alternative electricity source. Given the erratic situation in the country, the study recommends that government needs to provide palliatives to SMEs that would help reduce the burden of the power outages on the SMEs' operation. This can be done through giving them tax incentives or subsidies. Government should also encourage more competition in the power sector among the privatised companies in charge of power supply. Efforts should also be made by SMEs to access renewable energy sources such as solar energy.

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