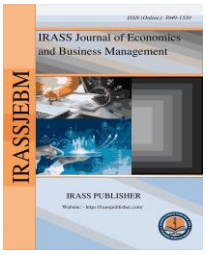
IRASS Journal of Economics and Business Management
Abbriviate Title- IRASS J Econ Bus Manag
ISSN *(Online) 3049-1320*
https://irasspublisher.com/journal-details/IRASSJEBM
Vol-2, Iss-3(March-2025)



ASSESSING THE IMPACT OF ELECTRICITY SUPPLY ON UNEMPLOYMENT RATE IN NIGERIA

Sabiu Bariki Sani[1*], Oyinlola Olaniyi[2], Kareem Ibrahim Tanko[3]

[*1-2-3] Department of Economics, University of Abuja, Nigeria

Corresponding Author **Sabiu Bariki Sani**

Department of Economics, University of Abuja, Nigeria

Article History

Received: 08 / 03 / 2025

Accepted: 23 / 03 / 2025

Published: 27 / 03 / 2025

Abstract: This study assesses the relationship between electricity supply and unemployment in Nigeria. Using a time series annual data from 1990 to 2023, the study employs the Autoregressive Distributed Lag (ARDL) model bounds test and Pairwise Granger causality test to analyze the relationship. The bound test result revealed the existence of long-run cointegration among the variables as the F-statistic 4.433277 is greater than the critical value 3.23 at lower bound level and 4.35 at upper bound level. The Error Correction coefficient is approximately -0.571300 has the expected negative sign and it is also statistically significant considering the probability value which is 0.0026. After a shock, the ECM value indicates an average speed of adjustment to equilibrium, which can be attained with a 57% adjustment speed. Given the statistical significance of the P-values (0.0285 and 0.0045, respectively), the Granger causality test indicates a bi-directional causal relationship between ELS and UR. The study comes to the conclusion that Nigerian unemployment is significantly influenced by the availability of electricity since there is a negative correlation between the two, indicating that a rise in electricity supply may result in a fall in unemployment. The study, therefore recommends that government should prioritize investments in the electricity sector to improve electricity supply and reduce unemployment and also implement policies like Expatriate Employment Levy, Prohibition of Casualization, Redundancy and Business Transfer Regulations, etc., to promote the development of labor-intensive industries that can absorb the unemployed labor force.

Keywords: Electricity supply, Unemployment, Nigeria, ARDL.

How to cite: Sani, S. B., Olaniyi, O., Tanko, K. I., (2025). ASSESSING THE IMPACT OF ELECTRICITY SUPPLY ON UNEMPLOYMENT RATE IN NIGERIA. *IRASS Journal of Economics and Business Management. 2(3),15-22.*

1. Introduction

Unemployment is a major macroeconomic problem facing most developing countries. It is a situation in which people willing and capable of working are unable to find suitable jobs to earn a living. Every economy strives to achieve three macroeconomic goals - price stabilization, full employment, and high rate of output growth (Chinedu, 2017). Through gainful employment, the working class attracts wealth to themselves, their dependents and to their nation. The issue of unemployment has become a world-wide phenomenon demanding for increased attention, though the impact is more astounding in developing economies (George and Oseni, 2012). Unemployment is seen to be liable for a high level of poverty, inequality, increasing rate of criminality, and general low level of living in the country (sani 2014).

Nigeria, Africa's largest economy (IMF, 2021), has been grappling with the twin challenges of inadequate electricity supply and high unemployment rates. The country's power sector has been plagued by inefficiencies, inadequate infrastructure, and corruption, resulting in a significant shortfall in electricity generation and distribution. On the other hand, Nigeria's unemployment rate has been on the rise, with the National Bureau of Statistics (NBS) reporting an unemployment rate of 33.3% in 2020 (Muktar & Zakari 2021).

Several attempts have been made to curtail unemployment rate in Nigeria which include the introduction of Operation Feed the Nation program by Obasanjo's regime in the mid-1970s, MAMSER, DFFRI and NDE programs by the Babangida's administration in the 1980s. National poverty Eradication program (NAPEP) by Obasanjo's government in 2001, Youth Empowerment Scheme (YES) by Yar'Adua's government in 2008, Subsidy Reinvestment and Empowerment Program (SURE-P) by Jonathan's government in 2012, National Social Investment Program (NSIP) and N-Power program by Buhari's administration in 2016. None of the interventions achieved significant results in curtailing the monster of unemployment in Nigeria.

In Nigeria, reduced electricity supply is perhaps the greatest infrastructural challenge facing the nation. Some sectors of the economy experiences power failure or voltage fluctuations about seven times per week, each lasting for about two hours, without the benefit of prior caution (Adenikinju, 2017). This imposes a huge charge on most businesses giving rise to joblessness and unemployment, low output, damaged equipment and restart costs. For the nation, this has seriously undermined the GDP of the nation.

The electricity supply crisis in Nigeria has had far-reaching consequences for the economy, including reduced economic

growth, decreased productivity, and increased unemployment as a result of wide gap between electricity supply and consumption in Nigeria (Sabiu and Sa'ada, 2019). The lack of reliable electricity supply has discouraged investment, hindered industrial development, and perpetuated poverty. Furthermore, the high unemployment rate in Nigeria has exacerbated social and economic problems, including poverty, inequality, and social unrest. Therefore, it is essential to investigate the relationship between electricity supply and unemployment in Nigeria to inform policy decisions that can address these challenges as the interplay between these two challenges is complex and multifaceted,

1.1 research question

In view of the aforementioned problems, the study seeks to provide answers to the following questions:

- Is there a long-run cointegration relationship between electricity supply and unemployment in Nigeria?
- Does electricity supply cause unemployment in Nigeria?

1.2 Objectives of the Study

The main objective of the study is to examine the impact of electricity supply on unemployment in Nigeria.

- To investigate the long-run cointegration relationship between electricity supply and unemployment in Nigeria.
- To examine the causal relationship between electricity supply and unemployment in Nigeria.

1.3 Research Hypotheses

To achieve the objectives of this study, the following research hypotheses were formulated in the null form

- H_0: There is no long-run relationship between electricity supply and unemployment in Nigeria.
- H_0: There is no causal relationship between electricity supply and unemployment in Nigeria

2. Literature Review and Theoretical Framework

2.1 Conceptual review

2.1.1Unemployment

Unemployment is a critical macroeconomic indicator that measures the percentage of the labor force that is without a job and actively seeking work. In Nigeria, unemployment has been a significant challenge, with youth unemployment rates particularly high. The drivers of unemployment in Nigeria are complex and include both structural and cyclical factors (Nnachi, 2023).

One of the key drivers of unemployment in Nigeria is the mismatch between the skills and qualifications of the labor force and the demands of the job market. Nigeria's education system has been criticized for not adequately preparing graduates for the demands of the labor market, leading to high levels of underemployment and unemployment. This mismatch is exacerbated by the lack of economic diversification occasioned by high dependence of Nigeria on oil which makes any shock in the international oil prices have a serious effect on its economy (Sa'ada and Sabiu, 2021) resulting into lack of job opportunities in key sectors of the economy, leading to high levels of youth unemployment.

Another driver of unemployment in Nigeria is the country's economic structure. Nigeria's economy is heavily skewed towards the informal sector, which accounts for a significant portion of employment in the country. However, the informal sector is characterized by low productivity, low wages, and poor working conditions, leading to high levels of underemployment and vulnerable employment. Additionally, the lack of a vibrant manufacturing sector and the dominance of the oil sector also contribute to high unemployment rates in Nigeria.

Government policies and interventions also play a crucial role in driving unemployment dynamics in Nigeria. For instance, policies that promote investment, entrepreneurship, and job creation can help reduce unemployment, especially among the youth. Similarly, investments in education, vocational training, and skills development can help address the skills gap in the labor market and reduce unemployment. In Nigeria, the growing rate of unemployment is becoming alarming and worrisome, and demanding for great concern to the economists, policy makers, economic managers, individuals, government and many others, as the impact is more devastating on national security, economic growth and sustainable development (Nnachi, 2023).

The empirical survey by NBS indicates that Nigeria's unemployment rate rose to 41% in 2023 from 37.7% in 2022 and 33.3% in 2021, translating to some 23.2 million people, the second-highest rate in the world (NBS, 2024), causing drastic reduction in Nigeria's GDP growth rate from all time high of 6.67% (GDP $574.18B and $3,201 per capita) in 2014 to 3.25% (GDP $477.39bn and per capita $2,184) in 2022 (IBRD-IDA, 2023). Nigeria has persistently faced unimaginable increasing level of unemployment rate from 21.1% in 2010 to 33.3% in 2021, 37.7% in 2022 and 41% in 2023 (NBS, 2024). Electricity supply has a direct impact on employment generation in Nigeria. A reliable electricity supply can stimulate investment and industrial growth, leading to the creation of job opportunities across various sectors of the economy. Conversely, inadequate electricity supply can lead to production cutbacks, reduced employment opportunities, and higher unemployment rates.

2.1.2Electricity Supply in Nigeria

Electricity is a controllable and convenient form of energy used in applications of heat, light, and power. Electricity is also defined as a set of phenomena caused by the existence, interaction, and motion of electric charges derived from electric potential energy or kinetic energy (Umar, Mathias, & Praisad, 2022). Electricity supply refers to the provision of electrical energy from generating sources to end-users, including residential, commercial, industrial, and agricultural consumers. Electricity is crucial for economic growth, industrialization, and job creation. It equally improves living standards, healthcare, education and communication. Electricity powers industries, drives productivity and competitiveness, supports agricultural production, processing, and storage and enhances environmental sustainability as it can reduce dependence on fossil fuels and promote cleaner energy. Its measurement ranges from installed Capacity (Total potential electricity generation capacity (MW)), total electricity produced (MWh) to distribution capacity (MW) (Alo, 2021).

Electricity supply is a very sensitive issue with several political and economic sophistications in many countries which most of the time define the industry's effectiveness. Thus, it has continuously drawn great attention from both the industrialists and the political class. As a matter of fact, it has become a veritable

avenue to gaining more votes during elections. This is just because if a politician can easily tackle issue of unavailability of electricity supply, then, such is considered a national hero. More important is the fact that every other sector of the economy depends on adequate supply of electricity (Ukoima and Ekwe, 2019).

In Nigeria, Electricity supply has been a major challenge for the country for many years. The history of electricity supply in Nigeria dates back to 1896 when electricity generation first began and the first power plant a 30kw, 1000v, 80 cycle, single-phase supply, with an additional unit installed in 1902. Since then, the electricity sector has undergone various changes and reforms, with the goal of improving electricity generation, transmission, and distribution to meet the increasing demand for power in the country (Alo, 2021).

2.2 Empirical Review

Nnachi and Ugochukwu(2023) evaluated the effect of unemployment and inflation on economic growth of Nigeria for the period between 1961 to 2021. The study used the ARDL model to measure the degree of effect and also deployed the Pesaran and Shin bound testing procedure to determine the short run and long run relationship of the employed variables. The findings revealed that inflation and unemployment have long run relationship with economic growth and therefore recommends that the government should tailor policies that can spur economic activities which in turn will reduce unemployment rate and stabilize prices.

Similarly, Iroh, Kalu and Nteegah (2022) utilized annual time series data from 2008 to 2018 and analyzed the data using the Fully Modified Ordinary Least Square (FOLS) technique. The results of the study showed an unfavorable relationship between power outages and total factor productivity. Whereas, electricity generation and population established a substantial positive impact on factor productivity, electricity pricing was found to substantially impact negatively on factor productivity. This implies that unstable power supply will lead to low factor productivity and by extension unemployment as factor inputs will be disengaged.

Imandojemu and Joseph (2021) examined the relationship between electricity blackouts and productivity in Nigeria employing the Fully Modified Ordinary Least Squares (FMOLS) to analyze secondary data spanning a period of 23 years. Findings from the study revealed an inverse relationship between productivity and electricity price, blackout and corruption such that an increase in any one of these variables adversely affects productivity; but this wasn't the case for electricity generation and population as they were found to influence productivity positively.

Using the ARDL technique, Sabiu and Sa'ada (2019) investigated the connection between Nigeria's economic development and power usage. The study made use of quarterly time series data for economic growth as well as a few other variables, including inflation rates, electricity loss, and supply and consumption. The findings show that electricity consumption has a favorable and considerable impact on economic growth over the long and short terms. It suggested that when forecasting and formulating plans for economic growth, power usage should be taken into account.

Ukoima and Ekwe (2019) examined how Nigeria's economic growth was affected by the availability of power between 1983 and 2017. According to the results, 68% of the general population and 100% of stakeholders in Umudike, Abia State, Nigeria, concur that the country's electricity supply has improved recently. An economy is projected to expand by 3.94% for every 1% increase in the supply of power. On the other hand, the supply and demand of electricity rise by 0.34% for every 1% increase in real GDP domestic product. The report suggested maintaining measures designed to increase Nigeria's energy supply's generation and delivery.

In their research, Ado and Josiah (2015) looked at how small enterprises in northeastern Nigeria were affected by inadequate electric power supplies. Their analysis demonstrates the impact of power outage severity and associated expenses on the operations of this category of firms in the area. They recommended that policy emphasis be directed at reviving Nigeria's electricity industry, which will boost the country's economy.

An detailed assessment of the relationship between economic growth and various forms of energy consumption was carried out by Omri and Kahouli (2014), who found that the research' findings were generally sensitive to the methodology and type of energy taken into consideration. He came to the conclusion that the results of earlier research were inconsistent and non-conclusive because of the various datasets, econometric approaches, and characteristics of the various countries. Other studies have identified various factors, including price, temperature, population, rate of urbanization, and education, in addition to the cases that indicate a causal association between GDP and energy use. For example, Ologundudu (2015) examined the causal and long-term relationships between Nigeria's economic development, industrialization, and energy supply between 1972 and 2010. The study also revealed a unidirectional relationship without a feedback effect between labour and electricity supply.

In a similar vein, Lionel (2013) investigated the connection between Nigeria's economic growth and the availability of power from 1970 to 2009. According to their research, the key factors influencing Nigeria's economic development include capital, technology, per capita GDP, and the country's lagging energy supply.

Using annual time series data gathered over a 36-year period from 1986 to 2020, Muktar and Abdullahi (2012) used the Ordinary Least Squares (OLS) technique to investigate the relationship between Nigeria's electricity supply and unemployment. The study found that a sufficient and dependable power supply, especially to the nation's industrial sector, contributes to a decrease in unemployment. As a result, it suggests that the government increase its investment in the nation's power sector through better budgetary allocation.

2.3 Theoretical Framework

There remain divergent theoretical debates among the economists and theorists regarding the issue of electricity supply and unemployment. However, the one prominent school of thoughts will be applied in this research work to discuss the multidimensional situation. This is the Deadweight Loss Theory.

Deadweight Loss Theory

The Deadweight Loss Theory, also known as the "Efficiency Loss Theory," is a concept in microeconomics that refers to the loss of economic efficiency that occurs when a market

is not in equilibrium. This theory was first introduced by economist Arthur Pigou in the early 20th century. The theory postulates that consumer / producer surplus is lost due to restriction imposed on output by external factors (Hayes & Porter-Hudak, 1987). Deadweight loss is defined as the loss of economic efficiency that occurs when a market is not in equilibrium, resulting in a reduction in the overall welfare of society. This loss occurs when the marginal benefit of a good or service is not equal to the marginal cost. There are several types of deadweight loss, including: Consumer surplus deadweight loss which occurs when consumers are unable to purchase a good or service at the market price, resulting in a loss of consumer surplus, Producer surplus deadweight loss which also occur when producers are unable to sell a good or service at the market price, resulting in a loss of producer surplus and Taxation deadweight loss that occurs when taxes are imposed on a good or service, resulting in a reduction in the quantity demanded and supplied.

Factors that could lead to deadweight loss ranges from Market failure when a market is not in equilibrium, resulting in a deadweight loss also Externalities which occur when the production or consumption of a good or service affects third parties, resulting in a deadweight loss and Taxes and subsidies which is when taxes or subsidies are imposed on a good or service, resulting in a deadweight loss.

This Theory is relevant to this study in several ways as it can help explain how market failures in the electricity sector can lead to deadweight losses, which can contribute to unemployment it can also explain how the lack of electricity supply can have negative externalities, such as increased unemployment, which can lead to deadweight losses and lastly the theory can help explain how taxes and subsidies in the electricity sector can lead to deadweight losses, which can contribute to unemployment.

By applying the Deadweight Loss Theory to this study, we can identify the market failures in the electricity sector that lead to deadweight losses and contribute to unemployment also estimate the deadweight loss resulting from the market failures and externalities in the electricity sector and evaluate the effectiveness of policy interventions, such as taxes and subsidies, in reducing deadweight losses and unemployment in the electricity sector. Overall, the Deadweight Loss Theory provides a useful framework for analyzing the impact of electricity supply on unemployment in Nigeria, and can help develop policy recommendations to address the challenges in the electricity sector.

3. Methodology

This study employs a quantitative research design, using secondary data on electricity supply and unemployment in Nigeria from 1990 to 2023 to examine the relationship between electricity supply and unemployment in Nigeria. The secondary data is sourced from the Nigerian National Bureau of Statistics (NBS) and the Central Bank of Nigeria (CBN). The variables used are unemployment rate (UR) which is the dependent variable, electricity supply (ELS), inflation rate (INF) and labor force participation rate (LFPR) as the independent variables. The study employs the ARDL bounds test to capture the long-run relationship/cointegration and Granger causality test to analyze the relationship between electricity supply and unemployment. The study also conducted unit root test, and some post-diagnostic test such as autocorrelation test and heteroscedasticity test.

3.1 MODEL SPECIFICATION

The model utilized in this study is derived from Frederick's (2014) presentation of The Effect of Electric Power Fluctuations on the Profitability of Unemployment Reduction, which employed an implicit variant of the stochastic demand function model. Given this, the following linear functional model represents the economic factors found in the literature for this study: The following is the model that was chosen for the study:

The functional form of the model;

UR = f(ELS, INF, LFPR)……..... (3.1)

Where:

ELS is electricity supply, INF is inflation rate and LPFR is Labor force participation rate and f = functional relationship.

The model finds the short-run and long-run impacts of electricity supply on unemployment in Nigeria as follows:

$UR_t = \alpha_0 + \alpha_1 ELS_t + \alpha_2 INF_t + \alpha_3 LFPR_t + \mu_t$ …… (3.2)

Where: μ_t = Disturbance term; α_0 = intercept term; α_1, α_2, α_3 = stimulus coefficients that measures percentage change in response.

A'priori Expectations

$\alpha_1, \alpha_2, \alpha_3 > 0$

The Autoregressive Distributed Lag (ARDL) model used in this study is expressed by further restructuring the model above and it is given as follows:

$$\Delta UR_t = \delta_0 + \delta_1 UR_{t-1} + \delta_2 ELS_{t-1} + \delta_3 INF_{t-1} + \delta_4 LFPR_{t-1} + \sum_{i=j}^{a} \gamma_1 \Delta UR_{t-i} + \sum_{i=j}^{b} \gamma_2 \Delta ELS_{t-i} + \sum_{i=j}^{c} \gamma_3 \Delta INF + \sum_{i=j}^{d} \gamma_4 \Delta LFPR_{t-i} + \mu_t \text{..... (3.3)}$$

Where: δ_0 = Constant Parameter

Δ = First difference operator

δ_i, γ_i = Vector of the parameter of the lagged values of the explanatory variables.

μ_t = Error term

Co-integration Test

The study used the autoregressive distributed lag (ARDL) bounds testing approach to evaluate the long-term relationship between unemployment rate and electricity supply in order to ascertain the co-integration or long-term link between the variables taken into consideration. Compared to other traditional co-integration methods like Engle and Granger (1987), the ARDL offers a number of benefits. Accordingly, the previously mentioned Autoregressive Distributed Lag Model (ARDL) will be applied. Following the determination of a co-integration relationship, the co-integration equation's long- and short-term parameters are estimated. The following specification is used to estimate the long-run co-integration relationship:

$$UR_t = \delta_0 + \delta_1 UR_{t-1} + \delta_2 ELS_{t-1} + \delta_3 GDPgr_{t-1} + \delta_4 INF_{t-1} + \delta_5 LFPR_{t-1} + \delta_6 POP_{t-1} + \mu_t \text{…… (3.4)}$$

Error Correction Mechanism (ECM)

The appropriate error correction equation is estimated as follows in order to determine the short-term relationship between the variables and the rate at which the model adjusts to equilibrium:

$$UR_t = \gamma_0 + \sum_{i=j}^{a} \gamma_1 \Delta UR_{t-i} + \sum_{i=j}^{b} \gamma_2 \Delta ELS_{t-i} + \sum_{i=j}^{d} \gamma_3 \Delta INF_{t-i} + \sum_{i=j}^{d} \gamma_4 \Delta LFPR_{t-i} + \gamma_5 ECM_{t-i} + \mu_t \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.5)$$

Where, ECM is the Error correction term of one period lag, while the coefficient γ_5 measures the speed of adjustment of the model's convergence to equilibrium.

4. Results and Interpretation

4.1 Summary Statistics

	UR	ELS	INF	LFPR
Mean	14.76235	7346.582	18.45500	75.08824
Median	14.00000	5082.550	13.45000	73.90000
Maximum	33.20000	23361.00	72.80000	82.70000
Minimum	1.800000	884.0000	5.400000	64.90000
Std. Dev.	9.009399	7710.853	15.84911	6.018143
Skewness	0.049467	0.988901	2.165469	-0.133840
Kurtosis	1.906295	2.663654	6.832764	1.751800
Jarque-Bera	1.708470	5.701840	47.38339	2.308679
Probability	0.425609	0.057791	0.000000	0.315266
Sum	501.9200	249783.8	627.4700	2553.000
Sum Sq. Dev.	2678.586	1.96E+09	8289.413	1195.195
Observations	34	34	34	34

The Summary statistics as derived through E-Views 9.0 version.

UNIT ROOT TEST RESULT

To ascertain the degree of stationarity of the data gathered on the variables included in the study, a unit root test was performed on the time series. Since none of the variables are integrated of order two 1(2), the results of the unit root tests using the Augmented Dickey Fuller (ADF) show that all of the variables satisfy this criterion.

Table 4.2: Unit Root Test

VARIABLE	ADF STAT	CRITICAL VALUES	STATIONARITY STATUS
UR	-8.328899	1% Critical Value (-3.653730) 5% Critical Value (-2.957110) 10% Critical Value (-2.617434)	*I* (1)
EL	-5.321230	1% Critical Value (-3.653730) 5% Critical Value (-2.957110) 10% Critical Value (-2.617434)	*I* (1)
INF	-4.408507	1% Critical Value (-3.661661) 5% Critical Value (-2.960411) 10% Critical Value (-2.619960)	*I* (1)
LFPR	-6.600428	1% Critical Value (-3.653730) 5% Critical Value (-2.957110) 10% Critical Value (-2.617434)	1 (1)

Source: *Computed using E-views 9 (See appendix II)*

Cointegration Test Results

From the table below, the bound test reveal the existence of long run cointegration among the variables. When unemployment rate (UR) is the dependent variable, i.e. in the function F_{UR}(UR/ELS, INF, LFPR), the null hypothesis of no cointegration between electricity supply and unemployment rate is rejected at 5% level of significance as the F-statistic 4.433277 is greater than the critical value 3.23 at lower bound level and 4.35 at upper bound level, indicating there is cointegration between electricity supply and unemployment rate.

Table 4.3

Dependent Variable	**Function**		**F-statistic**
UR	F_{UR} (UR/ELS, INF, LFPR,)		4.433277
Independent Variable	**Coefficients**	**Standard Error**	**T-Ratio (Prob)**
ELS (-1)	-0.000169	0.000120	-1.400514 (0.1817)
INF	-0.204196	0.065652	-3.110281 (0.0072)
LFPR (-1)	-0.172765	0.222534	-0.776352 (0.4496)
Asymptotic Critical Value for Rejecting Null Hypothesis			
Critical Value	At 5%		At 10%
Lower Bound	3.23		2.72
Upper Bound	4.35		3.77

Results of Error Correction Mechanism

Table 4.4

(Dependent variable: ΔUR)

Independent Variables	Coefficients	Standard Error	T-Ratio (Prob)
ΔELS	-0.000132	0.000212	-0.619344 (0.5473)
ΔINF	-0.778938	0.139365	-5.589210 (0.001)
Δ LFPR	-0.372183	0.291569	-1.276484 (0.2259)
CointEq(-1)	-0.571300	0.150539	-3.795023 (0.0026)

The Error Correction Model (ECM) result aids in quantifying how quickly the dependent variable (UR) adjusts to the explanatory variables. The % unemployment rate appropriately adapts to changes in the explanatory factors, according to the Error Correction Mechanism. Given the probability value of 0.0026, the Error Correction coefficient, which is roughly -0.571300, has the predicted negative sign and is statistically significant. After a shock, the ECM value indicates an average speed of adjustment to equilibrium, which can be attained with a 57% adjustment speed.

In contrast to the long-term estimation, the short-term results indicate that, at the 5% level of significance, there is a negligible negative correlation between the unemployment rate and the electricity supply (ELS) for the corresponding explanatory variables. Aside from the inflation rate (INF), which exhibits a negative but statistically significant link in the short term, the coefficient of labor force participation rate (LFPR) also indicates a negative and statistically insignificant relationship. In conclusion, the short-term findings show that factors related to the energy supply have no discernible impact on Nigeria's unemployment rate.

Results of Causality Test

Pairwise Granger causality test was conducted to determine whether or not causality runs between the variables and the direction of such causality. The results from the Pairwise Granger causality test are presented in table 4.5

Based on the results from the Pairwise Granger Causality test conducted, the null hypothesis that ELS does not Granger-cause UR is rejected and the alternative is accepted same for the null hypothesis that UR does not Granger cause ELS based on the statistical significance of the P-value which shows a bi-directional causality. But, there is only a unidirectional relationship between UR and LFPR and the rest results shows no causality.

Table 4.5: Results of Pairwise Granger Causality Test

S/NO	**NULL HYPOTHESIS:**	**OBS**	**F-STATISTIC**	**PROB.**
1	ELS does not Granger Cause UR	30	3.35216	0.0285
	UR does not Granger Cause ELS		5.21486	0.0045
2	INF does not Granger Cause UR	30	0.75740	0.5645
	UR does not Granger Cause INF		0.40157	0.8053
3	LFPR does not Granger Cause UR	30	1.37923	0.2750
	UR does not Granger Cause LFPR		2.82413	0.0509
4	INF does not Granger Cause ELS	30	0.13393	0.9681
	ELS does not Granger Cause INF		0.42935	0.7858
5	LFPR does not Granger Cause ELS	30	0.91721	0.4723
	ELS does not Granger Cause LFPR		1.42074	0.2618
6	LFPR does not Granger Cause INF	30	1.03749	0.4114
	INF does not Granger Cause LFPR		0.58433	0.6774

Note: *Significant at 5% (**) and 10% (*)*

Source: *Computed using E-views 9 (See appendix VI)*

Results of Post-Diagnostic Tests

The results of post-estimation diagnostic tests for serial correlation and heteroscedasticity were conducted in order to support the suitability of the estimated ARDL model, and they are shown in the table below.

Table 4.7: Results of the Diagnostic Test of the Selected ARDL Model

Test of Serial Correlation of Residuals		
L M Version	CHSQ (1)	3.8452 (0.050)
F Version	F (2,11)	3.4033 (0.064)
Autoregressive Conditional Heteroscedasticity Test of Residuals		
L M Version	CHSQ (1)	0.25233 (0.0415)
F Version	F (2,11)	0.20314 (0.075)

Note: *The values in parenthesis are probability values.*

The Langrange Multiplier (LM) test was used to check for serial correlation, and the study can accept the null hypothesis that there is no serial correlation if the p-value is 0.050. This is a desirable outcome that demonstrates the suitability of the estimated ARDL model. Additionally, the autoregressive conditional heteroscedasticity test was used to test for heteroscedasticity, and the p-value (0.0415) did not support the null hypothesis, which states that the model is homoscedastic. The model is not heteroscedastic, according to this. To put it briefly, the two post-estimation tests have supported one another in demonstrating that the estimated ARDL model is adequate.

5. Conclusion

In line with the findings of earlier studies such as (Muktar & Zakari 2021, George and Oseni, 2012), which have demonstrated that electricity supply has a significant impact on economic growth and development over the long term, the results of this study conclude that electricity supply has a significant impact on unemployment in Nigeria. The negative relationship between electricity supply and unemployment suggests that an increase in electricity supply can lead to a decrease in unemployment.

The results of this study, therefore indicate that there is a long-run relationship between electricity supply and unemployment in Nigeria. The ECM results contrary to the long-run estimation, show the existence of an insignificant negative relationship between Electricity supply (ELS) and Unemployment rate at 5% level of significance in the short-run. The findings of this study have important implications for economic policy in Nigeria.

Policy Recommendations:

The causality and long-term link between Nigeria's electricity supply and unemployment have been examined in this study. The study's conclusions have significant ramifications for Nigerian economic policy. The research suggests that:

- The Nigerian government should prioritize investments in the power sector like Renewable Energy Development, Grid Expansion and upgrade, increased Rural Electrification projects, implementation of Energy Efficiency Measures, increasing power generation Capacity and upgrading/expanding transmission and distribution infrastructure to help reduce power losses, ensure reliable electricity supply and reduce unemployment.
- The government should also implement policies such as Expatriate Employment Levy to encourage companies to hire local labor instead of foreign workers, Prohibition of Casualization in all forms and Redundancy and Business Transfer which will help protect workers' rights and promote the development of labor-intensive industries that can absorb the unemployed labor force.
- Furthermore, the government should invest in vocational training programs to enhance the skills of the labor force and improve their employability, Provide incentives for companies such as tax breaks, subsidies, and low-interest loans to companies that invest in labor-intensive industries and encourage public-private partnership to provide job opportunities for local workers.

References

1. Adeyemi A. Ogundipe and Ayomide Apata (2013). Electricity Consumption and Economic Growth in Nigeria. *Scientific Journal of Business Management and Applied Economics Vol. II, Issue 4.*
2. Alo Ebnezer Adebisi. (2021) Distorted Electricity Supply and the Profitability of SMEs: A survey of selected inhabitants in southwest Nigerian States. *Journal of Economics and allied Research. Vol. 6 No. 1. ISSN:2536-7447.*
3. Asaju Kayode , Samuel Arome and Silas Felix Anyio (2016). The rising rate of unemployment in Nigeria: the socio-economic and political implications. *Global Business and Economics Research Journal ISSN: 2302-4593 Vol. 3 (1).*
4. Daniel Adebamiwi and Stephen Ogundeyi (2023). Unemployment Rate and Economic Growth in Nigeria: An Empirical Analysis. *Ilaro Journal*

of Humanities and Management (IJOHAM) Volume 4, 2024 Edition ISSN: 2682- 6577 P a g e 1 | 5.

5. E.O. George and J.E. Oseni (2012). The Relationship between Electricity Power and Unemployment Rates in Nigeria. *Australian Journal of Business and Management Research Vol.2 No.02 [10-19]*.

6. Etim Akan, Alwell Nteegah and Barisua Nwinee (2023). Electricity consumption and economic growth in Nigeria: A Causality Analysis using ARDL Approach. *International Journal of Economics and Management Studies*. V10. No10. P105.

7. International Monetary Fund (IMF) (2020). Nigeria*: Staff Report for the 2020 Article IV Consultation.*
Iroh, O., Kalu, I. & Nteegah, A. (2022). Empirical impact of electricity outage on labour and capital productivity in Nigeria. Applied Journal of Economics, Management and Social Sciences, 3(1), 9–16. https://doi.org/10.53790/ajmss.v3i1 .23

8. Leera Lenu Kpagih, Chidum Chibueze Chinda and Victor Akidi (2022). Energy Price Fluctuation and Inflation in Nigeria: A Granger Causality Analysis. *Journal of Economics, Finance and Management Studies. Volume 5 Issue 03. Page 449-454.*

9. Muktar Iliyasu & Abdullahi Zakari (2021). Impact of electricity supply on unemployment in Nigeria (1986-2020)**.** *International Journal of Intellectual Discourse (IJID) ISSN: 2636- 4832Volume 4, Issue 4.*

10. Nnachi, D. N., & Ugochukwu, E. (2023). Unemployment, Inflation and Economic Growth: Evidence from Nigeria. *African Journal of Politics and Administrative Studies* (AJPAS), 16 (2), 762-783.

11. Nwankwo, Cosmas Anayochukwu and Ifejiofor, Adaobi Patrictia (2014). Impact of Unemployment on Nigerian Economic Development: A Study of Selected Local Government Area in Anambra State Nigeria. *European Journal of Business and Management Vol.6, No.35, 103-111*

12. O'Nwachukwu, Chinedu Increase (2017). Determinants of the Rate of Unemployment in Nigeria. *International Journal of Information Research and Review http://www.ijirr.com Vol. 04, Issue, 01, pp.3593-3595*.

13. Sa'ada Abba Abdullahi and Sabiu Bariki Sani (2021). Price and Income Elasticities of Domestic Petroleum Consumption in Nigeria. *Iranian Economic Review 2021, 25(4).*

14. Sabiu Bariki Sani (2014). Analysis of the effect of oil subsidy withdrawal on the economic growth of Nigeria. *University of Abertay Dundee*

15. Sabiu Bariki Sani and Sa'ada Abba Abdullahi (2019). Analysis of Electricity Consumption and Economic Growth in Nigeria: An ARDL Approach. *Journal of Economics and Finance. Volume 10, Issue 1.*

16. Ukoima Kelvin Nkalo and Ekwe Ogbonnaya Agwu (2019) Review of the Impact of Electricity Supply on Economic Growth: A Nigerian Case Study. *Journal of Electrical and Electronics Engineering Volume 14, Issue 1 Ser. I, PP 28-34.*

17. Umar Ali Hadiza, Mathias Fonkam and Rajesh Prasad (2022). Towards the sustainability of Power utilities in Nigeria: A Bayesian network approach. *International Journal of Information Technology. Vol.14, No. 2.*