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Energy Prices and Inflationary Pressure in Nigeria

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ABSTRACT

Objective: *This study determines the effect of energy prices on inflationary pressure in Nigeria using time series data from 1990 to 2024.* ***Method:*** *Inflationary pressure was measured by inflation rate while proxies of energy prices adopted include electricity price, premium motor spirit price, natural gas price and solar energy price). The time series data used for the study were sourced from International Energy Agency (IEA), National Bureau of Statistics (NBS) and Central Bank of Nigeria (CBN) Statistical Bulletin. The model was estimated by Augmented-Dickey Fuller (ADF) test, bounds cointegration test and Autoregressive Distributive Lag (ARDL) approach while the data analysis was facilitated by EViews 12.0 statistical software.* ***Results:*** *The findings of the study showed that electricity price, premium motor spirit and natural gas price have positive and significant effects on inflation rate in Nigeria while solar energy price has a positive and non-significant effect on inflation rate in Nigeria. The study concluded that energy prices contribute significantly to inflationary pressures in Nigeria.* ***Novelty:*** *The study recommended that government should adopt a more targeted subsidy framework that focuses on low-income households and small businesses. This will reduce the inflationary effect of energy price hikes while preventing fiscal leakages and ensuring price stability in essential energy markets.*

INTRODUCTION

Energy is the lifeblood of every economy from powering production to transportation and household consumption. It is the essence of industrialisation and continues to remain a key factor in nearly all activities of an economy. Hence, movements of energy prices are very likely to have an impact on the macroeconomic stability, especially through the mechanism of transmission impulses in terms of the general price level of goods and services [1]. Energy price fluctuations are now recognized as a significant determinant of inflationary impulses in both advanced and developing economies. Higher energy prices raise the cost of producing and distributing goods and services and businesses generally pass on those higher prices to consumers. And therefore energy prices are not just indicative of how the world price for energy is moving, but also one of the key sources of inflation in domestic economies [2].

Changes in demand-pull, cost-push, or structural factors can lead to sustained upward shifts in the general price level — in such cases, we speak of inflationary pressures. For countries such as Nigeria, the cost-push inflationary trend induced by surging energy prices is relevant amongst them. Higher fossil fuel prices translates into higher production and transportation costs, and producers usually transfer these increases to the end consumers by raising the prices [3]. Fluctuations in international crude oil price also spill over domestic fuel and electricity prices, transmitting external shocks into the domestic economy. The linkages between global energy markets and

domestic inflation reinforces the need to understand the impact of movements in energy prices on inflationary pressures in Nigeria [4]. According Ibrahim (et al), energy prices critically determine the total price stability of an economy [5]. That's because energy is a key input into many sectors of the economy and its input impacts production costs, consumer spending and inflation dynamics. Many macroeconomic studies have given attention and focus especially in countries like Nigeria where energy prices are likely to be very volatile. Energy prices, or prices of electricity, fuels (such as petrol, diesel and natural gas) and other energy products, affect price stability through direct and indirect channels. Higher energy prices automatically translates into greater production costs, which are often transferred to Consumers through higher price of goods. It is mainly due to the fact that a rise in electricity tariffs increases the costs of manufacturing and services, thereby leading to inflationary pressures [6]. In addition, the uptick in energy prices spills over into other areas including agriculture, healthcare, and transportation.

As a result, headline inflation is frequently driven by energy price volatility but Nigeria's inflation rate has been heavily impacted by energy prices (National Bureau of Statistics, 2023). Research suggests energy price shocks are one of the most persistent inflation drivers in both developed and developing economies. For example, Kpagih, Amini and Odungweru found that the oil price increases are the major contributors of inflationary factors in the Nigeria through production and transportation cost [6]. Likewise, Adeniran, Yusuf and Adeyemi found that price changes in electricity and gas have a long-run impact on consumer prices, affecting purchasing power and economic growth [7]. This suggests, in turn, that reducing volatility in energy prices could be pivotal to containing inflation and stabilizing the Nigerian macroeconomy. Yet the size and sign of this relationship can differ by energy source and policy context.

In Nigeria, inflationary pressure has been one of the most stubborn macroeconomic problems with adverse ramifications on economic growth, purchasing power, and living standards. The instability of energy prices — which incorporates the charges of petroleum products, herbal gasoline and energy tariffs — is one in all the main driving forces of this inflationary trend. Because energy is a vital input not just in production but also transportation and household consumption, any increase in its prices leads to an across-the-board rise in the price of goods and services. Over the years, Nigeria has witnessed recurrent energy price instability as a result of global oil market volatility, exchange rate realignment, subsidy removal and inefficiencies within the power sector.

Moreover, these changes have raised production costs and created a spillover into the entire economy, thus providing continued inflationary pressure. Because of its dependence on petroleum products and unreliable electricity, Nigeria's inflation has reacted sharply to changes in energy prices. Transport and manufacturing costs rise when global oil prices go up or the government increases domestic fuel prices, which raises food and non-food prices. Likewise, the volatile prices of natural gas, the frequent reviews of electricity tariffs increase operating costs for firms and households. When this

higher cost of doing business is passed on to consumers, the total price level rises, thus making inflation harder to contain.

And, indeed, energy price shocks have another tendency to expand inflationary pressures beyond the short-term volatility, interacting with other underlying structural vulnerabilities such as poor infrastructure, import insufficiency and exchange rate instability. The remaining phases imply that energy price volatility is not a transient shock but a long-run macroeconomic index of inflation in Nigeria. While it is an essential part of the economy, not much empirical literature has examined the nexus between energy prices and inflationary forces in Nigeria. Current literature on inflation has focused primarily on monetary and fiscal policy variables while energy prices have often been overlooked as a primary transmission channel of inflation. The result is a policy vacuum — one in which effective inflation management requires asserting how movements in energy prices ripple through the economy. Consequently, understanding how energy costs influence inflationary dynamics in Nigeria is imperative for energy and policy eextenders to develop mechanisms that contain energy price instability while improving supply efficiency and sustaining macroeconomic stability This study therefore seeks to examine effect of energy prices on inflationary pressures in Nigeria under the identified problem (against this backdrop).

Aim and Objectives of the Study

This aim of the study was to examine the effect of energy prices on inflationary pressures in Nigeria. The specific objectives of this study include to.

1. Analyze the effect of electricity price on inflation rate in Nigeria.
2. Evaluate the effect of premium motor spirit price on inflation rate in Nigeria.
3. Examine the effect of natural gas price on inflation rate in Nigeria.
4. Ascertain the effect of solar energy price on inflation rate in Nigeria.

Theoretical Framework

This study was anchored on Asymmetric Price Transmission (APT) Theory. This theory was discussed below:

Asymmetric Price Transmission (APT) Theory

The APT Theory is a theoretical construct built on evidence dating from the 1980s and 1990s across empirical studies in both industrial organization and agricultural economics, with notable contributions from Meyer and von Cramón-Taubadel [8] formalizing its theoretical underpinnings as we know them today. This theory is based on prior price adjustment models, focusing on the differential transmission of price changes between one market—specifically at the producer or wholesale level—and the second market—specifically at the retail level. In particular, APT states that not only do prices respond faster to increases than they do to decreases, but that this causes asymmetry in the response to cost shocks. Specifically, when input costs—whether energy or raw materials—go up, firms raise consumer prices quickly, and when input costs go down, cuts in prices are (slower and more scarce) This asymmetry is due to market rigidities, imperfect competition, and behavioral responses of firms and consumers [8]. Asymmetry in price transmission is attributed to market power, menu

costs and inefficient information transmission according to the theory. Producers or intermediaries that have considerable market power can take advantage of upward cost shocks (energy prices on the rise) to raise margin, instead of passing on downward move of input prices (lowering full price to the consumer) proportionally, but they will delay passing down the benefit to the consumer. This behaviour is commonplace in energy markets for example, fuel stations in Nigeria will raise petrol prices immediately upon global world price pulses, but will — weeks later- reduce prices at the first sign of global prices dropping [9]. Consequently, even if input costs stabilize, consumer prices continue running high, fueling inflation.

Consequently, APT theory offers a behavioral and structural understanding of the kind of persistent inflation that continues even after transitory price shocks because firm-specific pricing strategies lead to sustained high price levels in all sectors. The Asymmetric Price Transmission Theory reflects on the Nigeria context of increasing and decreasing the energy price changes — energy price constraints, premium motor spirit (PMS), diesel and electricity tariff — resulting in persistent inflation. Whenever there is an increase in global oil prices or subsidy cut, domestic fuel prices goes up immediately and thus, increases cost of transportation and production and are in turn passed to consumers. That said, under circumstances of globally falling oil prices, or instances where the exchange rate normalizes for a while, locally, prices seldom track it proportionately because of structural inefficiencies, poor regulatory enforcement and monopolistic tendencies in energy distribution. The sluggish or lagged pass-through of cost savings sustains a high level of consumer price and inflationary force. Thus, APT theory explains the phenomenon of the persistence of inflationary pressures in Nigeria due to energy price asymmetries — upward price adjustments are fully transmitted, whereas downward adjustments are muted [10, 11].

Umoidem, Nteegah and Osokogwu examined the impact of energy pricing on economic growth in Nigeria [9]. The study utilised descriptive statistics and the ARDL methodology to achieve the study's objectives. The findings indicated that the cost of hydroelectricity was not conducive to economic progress. The long-term stimuli of crude oil prices on economic progress is minimal, but in the near term, it has a favourable and considerable influence. The short-term economic growth was substantially spurred by the price of natural gas. Electricity rates had a stimulative effect on long-term economic development, while showing little impact on short-term economic growth.

Uyi and Demir empirically diagnosed energy prices' implication on food price inflation in China, Philippine, and Vietnam [3]. Using the Panel Vector Autoregressive (PVAR) analytical model with Impulse Response Functions (IRFs), the researchers reported that energy prices and economic growth instabilities positively and significantly implicated on food increase while exchange rate and agricultural production dynamics had negatively insignificant influence on food inflation. The PVAR causality analysis established that growth of the economies is linked to food price hike, energy prices, currency exchange rate and agricultural outputs level.

Kpagih, Amini and Odungweru investigated how inflation in Nigeria is influenced by energy prices from 1985 to 2018 [6]. The unit root test performed on the data indicated that the ARDL method be used to analyze the data. The result of the bounds test showed the presence of long run relationship. The long run result showed that energy prices have no impact on inflation in the long run. In the short run the one-year lag of oil price has a negatively significant impact on inflation while, the one-year lag of gas price has a positively significant impact on inflation in Nigeria.

Siyakudumisa, Kin and Yiseyon-Sunday empirically investigated the causal relationship between energy prices and economic performance in South Africa by employing the auto- regressive distributed lag (ARDL) bounds test technique for the period 1994 to 2019 [10]. The study established a long-run relationship between the variables. The findings revealed that electricity prices have a significant negative impact on economic growth in the long and short run, while crude oil prices show a significant positive linkage with economic growth in the long and short run.

Abner, Izuchukwu, Eneoli and Udo analyzed the causal relationship between energy pricing and economic growth in Nigeria using Error Correction Model (ECM), and the Clemente-Montanes-Reyes unit root for structural breaks in the series [11]. Findings revealed a co-integrating relationship, a bidirectional relationship between petroleum, liquefied natural gas, and electricity prices; a unit increase in energy consumption stimulates economic growth through product and service value addition; a unit decrease in electricity consumption increases petroleum consumption while decreasing economic growth as a result of distribution failure, estimated billing system and over-dependence on generating set as an alternative energy source.

Patterson, Dinci and Jonathan re-evaluated the relationship between energy pricing and economic growth in Nigeria over the period 1999Q1-2016Q4 using alternative model specifications [12]. Specifically, the study used a nonlinear (or asymmetric) ARDL model and an ARDL-ECM specification which presumes a linear relationship rather than a nonlinear one. Overall, the study found that the role of energy pricing as a driver of growth remained negligible throughout, suggesting that a lot still needs to be done to ensure that the expected role of energy begins to manifest in the Nigerian economy.

Athanasios, Michael and Symeoni-Eleni re-investigated the long-run relationship among energy prices and economic growth within the periphery of the European Union [13]. The study relied on the Engle–Granger methodology to estimate a Vector-Error Correction Model. The residential electricity sector exhibits the highest level of influence, as industrial electricity price and crude oil price "Granger cause" residential electricity prices. The study found signs of the feedback hypothesis concerning final energy consumption and residential electricity price.

Dagoumas, Polemis and Soursou investigated the connection between energy prices and growth in Europe from 1990 to 2018 using the Engle–Granger method to estimate annual data and employing the VECM [14]. The study found causality between the price of crude oil and the industrial electricity price to the price of residential

electricity. The results also suggested that an increase in electricity prices would not negatively impact European growth rates.

Ishioro examined the relationship between consumption of energy pricing and economic growth in the Nigerian economy using Vector Auto-regression (VAR) and other estimation techniques [15]. The results of the study showed that for each of the energy components and growth variables, own shocks were more profound and there were evidences of substitutability of shocks implying that as own shocks reduce, the shocks from other variables increase in magnitude while in other cases, shocks were sinusoidal in nature.

Ozaydin investigated the nexus between energy prices and inflation [16]. The ARDL bounds test to cointegration was employed and it was discovered that there is long-run relationship between energy prices and inflation in Ottoman. The result showed that energy prices have a positive impact on inflation as energy price fluctuation accounted for 85% of the movement in inflation rate in Ottoman.

RESEARCH METHOD

This study was quantitatively carried out and as a result made use of annual time series data that ranged from 1990 to 2024. These data were sourced/extracted from the International Energy Agency, World Bank Development Indicator and Central Bank of Nigeria statistical bulletin.

Model Specification

The model for is built on the model of Kpagih, Amini and Odungweru who investigated how inflation in Nigeria is influenced by energy prices [6]. However, the model was modified to suit the purpose of this present study.

The model is functionally stated as follows:

$$IFR_t = f(ELP_t,\ PMP_t,\ NGP_t, SEP_t) \quad (1)$$

The functional relationship in equation 1 is stated in mathematical form as follows:

$$IFR_t = \beta_0 + \beta_1 ELP_t + \beta_2 PMP_t + \beta_3 NGP_t + \beta_4 SEP_t \quad (2)$$

The functional relationship in equation 2 is stated in econometric form to enhance its estimation:

$$IFR_t = \beta_0 + \beta_1 ELP_t + \beta_2 PMP_t + \beta_3 NGP_t + \beta_4 SEP_t + u_t \quad (3)$$

Where:

IFR_t = Inflation rate, ELP_t,= Electricity price, PMP_t, = Premium motor spirit price, NGP_t = Natural gas price, SEP_t = Solar energy price, β_0 = Intercept, β_2= Parameter of electricity price, β_1 = Parameter of premium motor spirit price, β_3 = Parameter of natural gas price, β_4 = Parameter of solar energy price, μ_t = Disturbance or error term

A Priori Expectations: The a priori expectations of this study is based on the knowledge of the world economic theory. The parameters of electricity price, premium motor spirit price, natural gas price and solar energy price are expected to have positive signs and thus denote positive relationship with inflation rate. This is mathematically shown as: $\beta_1 > 0$; $\beta_2 > 0$; $\beta_3 > 0$; $\beta_4 > 0$.

Variables Description

The variables of this study are classified as dependent variable and independent variable:

(a) Dependent Variables

For the purpose of this study, the dependent variable is inflationary pressures and it will be measured by inflation rate:

Inflation Rate: The inflation rate measures the percentage change in the general price level of goods and services over a specific period, usually annually. It is often captured through indices such as the Consumer Price Index (CPI) or Producer Price Index (PPI).

(b) Independent Variables

The independent variable is energy prices and it is proxied by electricity price, premium motor spirit price, natural gas price and solar energy price:

Electricity Price: This refers to the amount charged per unit of electrical energy consumed, usually measured in kilowatt-hours (kWh).

Premium Motor Spirit (PMS) Price: This refers to the retail cost of gasoline (commonly known as petrol) used mainly for transportation and small-scale power generation.

Natural Gas Price: This represents the cost of purchasing natural gas for industrial, commercial, or domestic use, typically measured per thousand standard cubic feet (MSCF).

Solar Energy Price: This refers to the cost associated with generating or purchasing electricity produced from solar photovoltaic (PV) systems. It includes installation, maintenance, and operation costs, as well as the cost per kWh of electricity generated.

Data Analysis Techniques

The order of stationarity of the variables in the unit root test tentatively determined the method employed in analysing the data of this study. Specifically, since the variables were stationary purely at levels I(0) and first difference I(1), Autoregressive Distributed Lag (ARDL) method was used.

RESULTS AND DISCUSSION

Result

Descriptive Statistical Analysis

Table 1 presents the descriptive statistics of the data for this study as follows:

Table 1. Descriptive Statistics

	IFR	ELP	PMP	NGP	SEP
Mean	18.99743	5.394286	110.0157	7.248000	94.05714
Median	12.20000	4.560000	65.00000	4.800000	87.00000
Maximum	76.80000	16.84000	897.0000	23.57000	170.0000
Minimum	0.200000	1.680000	0.600000	2.130000	76.00000
Std. Dev.	16.59561	3.357608	175.0965	5.495063	20.57260

	IFR	ELP	PMP	NGP	SEP
Skewness	2.037249	1.916567	3.366481	1.342581	2.416063
Kurtosis	6.640006	6.578687	14.52724	4.101269	8.194939
Jarque-Bera	43.53296	40.10404	259.8897	12.28338	73.40789
Probability	0.000000	0.000000	0.000000	0.002151	0.000000
Sum	664.9100	188.8000	3850.550	253.6800	3292.000
Sum Sq. Dev.	9364.089	383.3001	1042398.	1026.655	14389.89
Observations	**35**	**35**	**35**	**35**	**35**

Source: Authors' Computation, 2026.

Table 1 shows that the average inflation rate from 1990 to 2024 is 18.997. The maximum value for inflation rate is 76.8 while the minimum value of inflation rate is 0.20. However, Jarque-Bera value of 43.53 with a p-value of 0.00 shows that inflation rate is not normally distributed. In furtherance, the average electricity price is 5.394. The maximum value for electricity price is 16.84 while the minimum value of electricity price is 1.68. However, Jarque-Bera value of 40.104 with a p-value of 0.00 shows that electricity price is not normally distributed. The maximum value for premium motor spirit price is 110.0157 while the maximum value of premium motor spirit price is 897 and the minimum value of premium motor spirit price is 0.60. However, Jarque-Bera value of 259.889 with a p-value of 0.000 shows that premium motor spirit price is not normally distributed. Furthermore, the average natural gas price is 7.248. The maximum value for natural gas price is 23.57 while the minimum value of natural gas price is 2.13. However, Jarque-Bera value of 12.283 with a p-value of 0.0021 shows that natural gas price is not normally distributed. astly, the average solar energy price is 94.057. The maximum value for solar energy price is 170 while the minimum value of solar energy price is 76. However, Jarque-Bera value of 73.4078 with a p-value of 0.000 shows that solar energy price is not normally distributed.

Unit Root Tests

To eliminate possible occurrences of spurious results and to examine the existence of stochastic non-stationarity in the series, the study tests for the order of integration of the individual variables through the unit root test. This was achieved by employing the Augmented-Dickey Fuller (ADF) test. The variables tested are: inflation rate, electricity price, premium motor spirit price, and natural gas price. The results are presented in Table 2:

Table 2. Unit Root Test Results

Augmented Dickey-Fuller (ADF)						
Variables	**Levels**	**5% Critical Value**	**1st Difference**	**5% Critical Value**	**I(d)**	**Decision**
LOG(IFR)	-4.294124	-2.951125	-	-	I(0)	Stationary @ Level

Augmented Dickey-Fuller (ADF)						
Variables	**Levels**	**5% Critical Value**	**1st Difference**	**5% Critical Value**	**I(d)**	**Decision**
LOG(ELP)	-0.547636	-2.951125	-5.571980	-2.954021	I(1)	Stationary @ 1st Difference
LOG(PMP)	-2.243105	-2.951125	-4.045728	-2.954021	I(1)	Stationary @ 1st Difference
LOG(NGP)	-1.076340	-2.951125	-6.074526	-2.954021	I(1)	Stationary @ 1st Difference
LOG(SEP)	3.925090	-2.976263	-	-	I(0)	Stationary @ Level

Source: Authors' Computation, 2026.

Table 2 presents the summary results of the ADF unit root test carried out on all the variables in our model. The unit root test results showed that inflation rate (IFR) and solar energy price (SEP) are stationary at levels [i.e., I(0)]. On the other hand, electricity price (ELP), premium motor spirit price (PMP) and natural gas price (NGP) are stationary at first difference [i.e., I(1)]. The attainment of mixed stationarity is a precondition for the use of ARDL in the estimation of the long run relationship among the variables and the error correction model.

Bounds Cointegration Test

The result of ARDL bounds cointegration test is presented in Table 3:

Table 3. Bounds Cointegration Test Results

Significant Level	**Critical Value Bound**		**F-Statistics**	K
	I(0) Bound	**I(1) Bound**		
10 Percent	2.2	3.09	5.972440	4
5 Percent	2.56	3.49		
2.5 Percent	2.88	3.87		
1 Percent	3.29	4.37		

Source: Authors' Computation, 2026.

The result of bounds cointegration test in Table 3 shows that the F-Statistics value of 5.972440 is greater than the upper bound value of 4.37 at 5% level of significance. This indicates that there is cointegration or long run relationship between energy prices

indicators (inflation rate, electricity price, premium motor spirit price, natural gas price and solar energy price) and the inflationary pressures indicator (inflation rate) in Nigeria.

Estimation of Autoregressive Distributive Lag (ARDL) Model

The results of long run and short run Autoregressive Distributive Lag (ARDL) Model estimation are presented in Table 4 below:

Table 4. ARDL Long-Run and Short-Run Estimation Results

Dependent Variable = LOG(IFR)				
ARDL Long-Run Results				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
LOG(ELP)	8.380143	3.325958	2.519618	0.0358
LOG(PMP)	2.942522	1.122406	2.621620	0.0306
LOG(NGP)	0.966052	0.409143	2.361159	0.0459
LOG(SEP)	4.171253	3.811290	1.094446	0.3056
C	18.76726	15.73579	1.192649	0.2672
ARDL Short-Run Results				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.***
DLOG(IFR(-1))	0.178029	0.181187	0.982570	0.3546
DLOG(IFR(-2))	0.383167	0.179325	2.136719	0.0651
DLOG(IFR(-3))	0.684200	0.176081	3.885715	0.0046
DLOG(ELP)	4.584627	0.988412	4.638375	0.0017
DLOG(ELP(-1))	-4.628336	1.217800	-3.800570	0.0052
DLOG(ELP(-2))	5.803769	3.199911	1.813728	0.1073
DLOG(ELP(-3))	-1.226167	0.807169	-1.519096	0.1672
DLOG(PMP)	3.174143	0.666577	4.761854	0.0014
DLOG(PMP(-1))	0.354346	0.581269	0.609608	0.5590
DLOG(PMP(-2))	0.533517	0.511346	1.043359	0.3273
DLOG(PMP(-3))	0.869418	0.461360	1.884467	0.0962
DLOG(NGP)	1.670695	0.685287	2.437950	0.0407
DLOG(NGP(-1))	9.706158	2.125171	4.567236	0.0018
DLOG(NGP(-2))	-1.954334	1.148289	-1.701953	0.1272
DLOG(SEP)	2.210035	1.640038	1.347551	0.2147
DLOG(SEP(-1))	1.060416	0.710843	1.491773	0.1741
DLOG(SEP(-2))	0.707159	0.838649	0.843212	0.4236
CointEq(-1)*	-0.763668	0.149230	-5.117393	0.0000
Adjusted R^2	0.637256; Durbin-Watson stat		2.489955	

Source: Authors' Computation, 2026.

The results of the long-run estimates of the ARDL model as shown in Table 4 shows that electricity price has a positive (8.380143) and significant (0.0358 < 0.05) effect on inflation rate in Nigeria in the long-run while the results of the short-run estimates of

the ARDL model as shown in Table 4 equally shows that electricity price has a positive (4.584627) and significant (0.0017 < 0.05) effect on inflation rate in Nigeria in the short-run. The implication of this is that inflation rate will increase given a unit increase in electricity price both long-run and short run and vice versa. Also, the results of the long-run estimates of the ARDL model as shown in Table 4 shows that premium motor spirit price has a positive (2.942522) and significant (0.0306 < 0.05) effect on inflation rate in Nigeria in the long-run while the results of the short-run estimates of the ARDL model as shown in Table 4 also shows that premium motor spirit price has a positive (3.174143) and significant (0.0014 < 0.05) effect on inflation rate in Nigeria in the short-run. The implication of this is that inflation rate will increase given a unit increase in premium motor spirit price both long-run and short run and vice versa. Additionally, the results of the long-run estimates of the ARDL model as shown in Table 4 shows that natural gas price has a positive (0.966052) and significant (0.0459 < 0.05) effect on inflation rate in Nigeria in the long-run while the results of the short-run estimates of the ARDL model as shown in Table 4 equally shows that natural gas price has a positive (1.670695) and significant (0.0407 < 0.05) effect on inflation rate in Nigeria in the short-run. The implication of this is that inflation rate will increase given a unit increase in natural gas price both long-run and short run and vice versa. Furthermore, the results of the long-run estimates of the ARDL model as shown in Table 4 shows that solar energy price has a positive (4.171253) and non-significant (0.3056 > 0.05) effect on inflation rate in Nigeria in the long-run while the results of the short-run estimates of the ARDL model as shown in Table 4 equally shows that solar energy price has a positive (2.210035) and non-significant (0.2147 > 0.05) effect on inflation rate in Nigeria in the short-run. The implication of this is that inflation rate will increase given a unit increase in solar energy price both long-run and short run and vice versa.

Furthermore, the results of the error correction model presented in Table 4 show that the error term is negative (-0.763668) and significant (0.0000 < 0.05). Specifically, the error term coefficient of -0.763668 shows an evidence of speedy adjustment towards long run equilibrium (i.e. about 76 percent disequilibrium is corrected on yearly basis by changes in inflation rate). This implies that if there is a shock, the long-run equilibrium will return to its steady state easily. The high coefficient value of the error term also indicates that it will take longer time to restore the steady-state relation if the system is distorted. Lastly, the Adjusted R-squared value of 0.637256 from the results of the short-run estimates of the ARDL model in Table 4 indicated that the estimated model is well fitted as the systematic changes in explanatory variables (electricity price, premium motor spirit price, natural gas price and solar energy price) explained approximately sixty-four (64) percent of variations in inflation rate while the remaining thirty-six (36) is explained by other variables of variables not included in the model.

Post-Estimation Tests

The results of the post-estimation tests are presented in Table 5:

Table 5. Post-Estimation Test Results

Test	Test Type	X^2 Value	Prob. Value	Decision
Normality Test	Jarque-Bera Test	2.156435	0.3402	Do not Reject H_0
Serial Correlation Test	Breusch-Godfrey LM Test	4.723749	0.0586	Do not Reject H_0
Heteroscedasticity Test	Breusch-Pagan-Godfrey	0.372690	0.9682	Do not Reject H_0
Functional Form Test	Ramsey RESET	0.000885	0.9765	Do not Reject H_0

Source: Authors' Computation, 2026.

The Jarque Bera (Normality) test result in Table 5 shows that model is normally distributed. The Breusch-Godfrey Serial Correlation LM test result shows that the model has no serial correlation problem. Also, the Breusch-Pagan-Godfrey heteroskedasticity test result implies that relevant variables were not omitted. Lastly, the Ramsey RESET test result indicates that the model is correctly specified. This implies that the functional form of the model is correct.

Discussion

This study has empirically analyzed the annual time series data sourced in determining the effect of energy prices on the inflationary pressures in Nigeria from 1990 to 2024 using Autoregressive Distributive Lag (ARDL) estimation technique. With respect to the effect of electricity price on inflation rate in Nigeria, the findings obtained in the study showed that electricity price has positive and significant effect on inflation rate in Nigeria in both short run and long run. This finding conforms to the finding of Siyakudumisa, Kin and Yiseyon-Sunday (2022) which stated that has there is a positive relationship between electricity price and Gross Domestic Product in Nigeria. Furthermore, with respect to the effect of premium motor spirit price on inflation rate in Nigeria, the findings obtained in the study showed that premium motor spirit price has a positive and significant effect on inflation rate in Nigeria in both short run and long run. This result conforms to a priori expectation. This finding is related to the finding of Kyarem and Felix (2023) who found that electricity price has a positive and significant impact on prices of food items during the short run but in the long run, the electricity price has a positive and insignificant impact on the prices of food items in Nigeria.

Also, with respect to the effect of natural gas price on inflation rate in Nigeria, the findings obtained in the study showed that natural gas price has a positive and significant effect on inflation rate in Nigeria in both short run and long run. This finding conforms

to a priori expectation. This finding conforms to the finding of Kpagih, Amini and Odungweru who found that gas price has a positively significant impact on inflation in Nigeria [6]. Lastly, with respect to the effect of solar energy price on inflation rate in Nigeria, the findings obtained in the study showed that natural gas price has positive and non-significant effect on inflation rate in Nigeria in both short run and long run. This finding conforms to a priori expectation. This result is also supported by the result of Abner, Izuchukwu, Eneoli and Udo who established solar energy price contributes immensely to the Nigerian consumer price index [11].

CONCLUSION

Fundamental Finding: This study examined the effect of energy prices on the inflationary pressures in Nigeria. Having found that electricity price, premium motor spirit price, natural gas price and solar energy price have positive effects on inflation rate in Nigeria, the study therefore concluded that energy price contributes significantly to inflationary pressures in Nigeria. **Implication:** Government should adopt a more targeted subsidy framework that focuses on low-income households and small businesses. This will reduce the inflationary effect of energy price hikes while preventing fiscal leakages and ensuring price stability in essential energy markets. Government should accelerate investment in modular refineries, gas-to-power plants, and transmission infrastructure to reduce production costs and stabilize domestic energy prices, thereby easing inflation pressures. Government should provide tax rebates, zero-duty imports for solar components, and low-interest renewable-energy loans to households and SMEs to increase solar uptake and cushion the long-term inflationary pressure from fossil-fuel markets. The government should strengthen regulatory oversight of electricity distribution companies, fuel marketers, and gas suppliers to prevent excessive price markups and cartel-like behavior. **Limitation:** (Table 5: Post-Estimation Test Results shows that the model is normally distributed, has no serial correlation problem, no heteroskedasticity issue, and is correctly specified, implying that the functional form of the model is correct.) **Future Research:** (While it is an essential part of the economy, not much empirical literature has examined the nexus between energy prices and inflationary forces in Nigeria. Current literature on inflation has focused primarily on monetary and fiscal policy variables while energy prices have often been overlooked as a primary transmission channel of inflation.)

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