Fuel Subsidy and Consumer Price Index (CPI) in Nigeria

Okore Amah Okore (PhD)[1], & Charles Amobi Aneke[2]

[1]*Department of Finance, Federal University Lokoja – Kogi State, Nigeria*
okore.okore@fulokoja.edu.ng
[2]*Department of Accounting, Federal University, Gashua - Yobe State, Nigeria*

Abstract
This study investigated the effect of fuel subsidy on consumer price index (CPI) in Nigeria from 1981 to 2023. The ex-post facto research design was adopted, using annual time series secondary data. The Augmented Dicky Fuller (ADF) unit root test was used to ascertain the stationarity properties of the variables. The unit root test revealed a mixed order of integration among the variables, leading to the application of the Auto-regressive Distributed Lag (ARDL) method in the analysis. Oil prices were used as proxy for fuel subsidy. Findings from the study revealed that, fuel prices have a statistically insignificant impact on CPI in the short run, but a statistically significant positive impact in the long-run. There is also a unidirectional causality from fuel price to CPI. This implies that changes in oil prices can significantly influence the level of CPI in the country. All the empirical evidence presented in the study underscored the importance of considering oil price fluctuations as a crucial determinant of CPI in Nigeria. The study therefore recommends that policymakers and stakeholders need to closely monitor and manage the impact of oil price movements on CPI by adopting proactive inflation management policies to mitigate the adverse effects of oil price-induced inflationary pressures.
Keywords: Fuel, Subsidy-Effect, Consumer Price Index, Nigeria

Introduction

Subsidy is a concept used to refer to the financial assistance or benefit provided by a government to reduce the cost of goods or services, thus making them more affordable for consumers. Subsidies can take various forms, including direct financial payments, tax reductions, or price controls. They are commonly used in sectors like agriculture, healthcare, and energy to achieve social welfare objectives, stimulate economic growth, or stabilize prices (World Bank, 2020). The concept of subsidy is rooted in the economic principle of government intervention to correct market inefficiencies and promote social equity and fairness. Subsidies are designed to reduce production costs for businesses or retail prices for consumers, thereby enhancing accessibility to essential goods and services (Adebayo, 2021).

Over the years, however, fuel subsidies have created a significant financial burden on government revenues, with billions of naira allocated annually to maintain artificially low fuel prices (World Bank, 2020). This unsustainable expenditure has necessitated multiple attempts to remove or reduce subsidies, yet the ripple effects of such policies have often outweighed their intended benefits (Mohammed et al., 2024).

One major consequence of subsidy removal is its impact on cost-of-living and Consumer Price Index (CPI), a key measure of inflation. According to Adebayo (2021), the removal of subsidies led to higher fuel prices, which in turn raise transportation and production costs across various sectors of the economy. This creates a chain reaction, escalating the prices of essential goods and services and disproportionately affecting low- and middle-income households (Adebayo, 2021). For instance, the removal of fuel subsidy in Nigeria has triggered widespread inflation, contributing to heightened socioeconomic tensions, as seen during the "Occupy Nigeria" protests (Obi, 2023).

Empirical evidence on the relationship between fuel subsidy removal and CPI in Nigeria remains limited and fragmented. Most studies focus on the fiscal implications of subsidy removal, while insufficient attention has been paid to its effects on Consumer Price Index over an extended period. Understanding how fuel subsidy removal

has influenced the CPI between 1981 and 2023 is crucial for addressing these knowledge gaps and informing more effective policy design for Nigeria.

This study, therefore, seeks to investigate the impact of fuel subsidy removal on CPI in Nigeria from 1981 to 2023.

Review of Related Literature

Conceptual Framework

Subsidy and Fuel Subsidy

Subsidy is generally defined as a financial assistance or benefit provided by a government to reduce the cost of goods or services, thereby making them more affordable for consumers. Subsidies can take various forms, including direct financial payments, tax reductions, or price controls. However, fuel subsidies stand out as one of the most contentious forms of government intervention. In oil-producing nations like Nigeria, fuel subsidies have been used to stabilize domestic energy prices and prevent the adverse effects of global oil price volatility on local economies (Obi, 2023).

Fuel subsidies are a specific type of subsidy aimed at reducing the cost of petroleum products such as gasoline, diesel, and kerosene. These subsidies are typically implemented to protect consumers from the volatility of global oil prices and ensure affordability, especially in developing countries where energy consumption is critical to livelihoods. While fuel subsidies provide short-term economic relief, they often lead to long-term inefficiencies, including fiscal burdens, resource misallocation, and environmental degradation (Adebayo, 2021). In Nigeria, fuel subsidies have historically played a pivotal role in shaping economic policies and consumer price dynamics, but their removal often triggers inflationary pressures due to increased transportation and production costs (Adebayo, 2021).

Consumer Price Index

The Consumer Price Index (CPI) serves as a crucial tool for understanding and measuring inflationary trends within an economy. Defined as a numerical representation of changes in the cost of a basket of goods and services over time, the CPI provides valuable insights into overall price movements that affect consumers' purchasing power (Smith & Brown, 2020). Inflation, as explained by Brown and Green (2019), manifests as a sustained increase in the general price level, and the CPI serves as a primary gauge for tracking this phenomenon. By monitoring the prices of essential goods and services commonly purchased by households, the CPI captures the impact of inflation on consumers' daily lives and economic decision-making processes.

Theoretical Framework

This study is anchored on the Symmetric Relationship Theory and the Cost-Push Inflation Theory.

The Symmetric Relationship Theory

This study is anchored on the Symmetric Relationship Theory. The Symmetric Relationship Theory involves a comprehensive understanding of the interconnected dynamics between oil prices and economic growth. It posits that fluctuations in oil prices play a crucial role in shaping the volatility of Gross National Product (GNP) growth (Hamilton, 1983; Gisser & Godwin, 1986; Hooker, 1996; Laser, 1987). According to this theory, events in the oil market, particularly changes in oil prices, exert a substantial influence on the economies of both oil-exporting and oil-importing nations. Hooker (2002) emphasizes the significant impact of oil price levels and variations on GDP growth during specific historical periods, highlighting the broad economic ramifications of oil price dynamics.

Cost-Push Inflation Theory

The Cost-Push Inflation Theory is another relevant framework for understanding the impact of fuel subsidy on the Consumer Price Index (CPI). This theory, developed by economists such as John Hicks (1939) and further expanded by later scholars, posits that inflation occurs when the cost of production inputs rises, leading businesses to pass these increased costs onto consumers in the form of higher prices. Fuel prices play a pivotal role in production and transportation costs across various sectors of the economy. According to this theory, an increase in fuel prices, such as what occurs following the removal of fuel subsidies, directly raises the costs of goods and

services. For instance, higher transportation costs increase the prices of food and other consumer goods, while energy-intensive industries experience escalated production costs, further exacerbating inflation (Mankiw, 2016). In the context of this study, the Cost-Push Inflation Theory is highly relevant. The removal of fuel subsidies in Nigeria is expected to act as a cost-push factor, triggering inflationary pressures due to increased fuel and transportation costs.

Empirical Review

Adepoju, Balogun, and Bekesuomowei (2023) explored the economic challenges resulting from increased transportation costs due to fuel subsidy removal in Nigeria. Secondary data were collected from Statista, the World Bank database, and Premium Motor Spirit (PMS) price records from 2011 to 2023. Using Pearson Product Moment Correlation Coefficient as test statistics and SPSS software to aid analysis, the study examined the relationships between GDP, PMS prices, and inflation rates. The results indicated that inflation rose by 64% as fuel prices increased, while GDP declined by 42.5%.

Ikenga and Oluka (2023) investigated the effects of petroleum subsidy withdrawal, fuel price hikes, and their impact on the Nigerian economy. The study aimed to evaluate how subsidy reductions influence fuel prices and the cost of goods in other economic sectors. Using an input-output model, the study computed sectoral value-added data from the flow of goods table. The effects of varying subsidy reductions (10%, 20%, 30%, 40%, and 50%) on product prices in other sectors were analyzed. The results revealed that subsidy reductions led to higher petroleum product prices, which in turn increased transportation fares. This ripple effect extended to other sectors, causing price surges due to the interdependence among sectors. The study emphasized the importance of policymakers considering the broad economic consequences of subsidy removal to mitigate adverse effects.

Greve and Lay (2023) examined the consequences of fossil fuel subsidy removal on household choices of cooking fuels. The research indicates that households, in response, "stepped down the energy ladder," manifesting a decrease in modern fuel use and an expansion in the use of transitional and traditional fuels. Following a 50% price increase for liquefied petroleum gas (LPG) and a 20% increase for diesel, the study observes a 3-percentage-point rise in the share of households primarily using firewood. Urban households exhibited a 17% increase in charcoal consumption, while LPG expenditure remained constant, suggesting a decline in consumption. Preliminary cost-benefit calculations imply that overall welfare costs, encompassing the rise in cooking-related greenhouse gas emissions, slightly surpassed fiscal savings. Notably, the removal of the LPG subsidy was likely to have negative social implications.

Harring et al. (2023) conducted a comparative examination of attitudes regarding carbon taxation and the removal of fossil fuel subsidies in five developing countries spanning four continents. Their findings indicate that (1) the undesirability of removing fossil fuel subsidies is not higher than introducing carbon taxation, and (2) the public exhibits more favourable attitudes toward subsidy removal when there is a specified optimal utilization of the saved fiscal revenues.

Wang et al. (2022) analyzed the interplay between oil price volatility, inflation, and economic growth in oil-importing and oil-exporting nations over a 30-year period. Using advanced econometric techniques like generalized methods of moments (GMM) and fixed effects models, the study finds that oil price volatility negatively affects economic growth in both oil-importing and oil-exporting countries. Oil-exporting nations like Norway and Canada are particularly vulnerable to price volatility. The study highlights the need for these countries to diversify their economic base to mitigate oil price-induced economic shocks.

Zakaria et al. (2021) explored the effects of global oil prices on inflation in South Asian nations, analyzing monthly data from 1980 to 2018 using cointegration and vector autoregressive (VAR) models. The findings reveal that global oil price shocks have a permanent and asymmetric effect on inflation. Positive oil price shocks significantly increase inflation, whereas negative shocks have minimal impact. This asymmetry suggests that policymakers must address oil price volatility through targeted economic strategies to manage inflation effectively.

Oloko et al. (2021) investigated how oil price shocks influence inflation persistence in 10 oil-exporting and importing nations using a fractional cointegration vector autoregressive (FCVAR) model. The study shows that inflation persistence remains stable despite oil price shocks, suggesting that monetary policies in these nations absorb such shocks effectively. The results emphasize the importance of accounting for oil price asymmetry in inflation models to avoid overstating inflation persistence.

Talha et al. (2021) analyzed the effects of oil prices, energy consumption, and economic growth on inflation in Malaysia from 1986 to 2019. Using econometric models, the study finds a positive relationship between oil prices and inflation, highlighting the role of energy consumption in driving economic growth. The study recommends that the Malaysian government adopt policies to stabilize oil prices and manage energy consumption to control inflation effectively.

Methodology

Research Design

This study adopted the ex-post facto research design to investigate the impact of fuel subsidy on the Consumer Price Index in Nigeria from 1981 to 2023. The ex-post facto design is appropriate because it examines the relationships between the variables without manipulating them, relying on historical data and pre-existing conditions. This approach allows for the analysis of how changes in fuel prices, used as a proxy for subsidy removal, have influenced the CPI over time while accounting for control variables such as exchange rate and unemployment rate.

Nature and Sources of Data

The study made use of secondary data which were collected from the Central Bank of Nigeria Statistical Bulletin, World Bank Indicator and the Nigerian National Petroleum Corporation (NNPC). The nature of data is annual time series (trend) from 1981 to 2023, focusing on key variables such as the Consumer Price Index (CPI), fuel prices (used as a proxy for fuel subsidy removal), exchange rates, and unemployment rates. These data points are critical for analyzing the relationship between fuel subsidy removal and inflationary trends in Nigeria. The choice of secondary data is motivated by its availability, reliability, and the fact that it allows the study to examine historical trends and correlations, enabling a robust analysis of the economic effects of the policy change over time.

Models Specification

This study adopted the framework of the Linear/Symmetry Relationship Theory, building upon empirical findings from Umar and Umar (2013) and Siddig et al. (2014), while modifying some variables to enhance the model's applicability. The theory elucidates the intricate dynamics between policy changes and economic indicators, suggesting that shifts in key variables such as fuel prices significantly influence inflationary trends. However, for the purpose of this study, the relationship between the dependent variable (Consumer Price Index - CPI) and the independent variable (fuel price, used as a proxy for fuel subsidy removal), alongside the control variables (exchange rate and unemployment rate), is specified as follows:

$CPI = f(\text{OILP, EXCH, UNEMP})$ - - - - - - - 1

Where;

CPI = Consumer Price Index

OilP = Crude Oil Price as proxy to fuel subsidy

Exch = exchange rate

Unemp = Unemployment rate

The exact form of the above linear function (equation 1) expressed in econometric form can be rewritten as:

$CPI = \alpha_0 + \beta_1 OilP_t + \beta_2 Exch_t + \beta_3 UNEMP_t + \mu_t$ - - - - - 2

To ensure unison in measurement of the variables in this model and to analyze the variables based on its growth rate, the variables employed in this model are logged. Hence, the logged model specification is given as:

$CPI = \alpha_0 + \beta_1 LNOilP_t + \beta_2 Exch_t + \beta_3 UNEMP_t + \mu_t$ 3.3

Where, ln is natural logarithm and μ_t is error term. It should be noted that CPI, exchange rate and unemployment rate are not logged because they are in rate

Method of Data Analyses

In an attempt to achieve the objectives of this study, the Autoregressive Distributed Lag (ARDL) and Granger Causality test are employed. Other Statistics test performed before and after the functions stated above in order to test for stationarity, stability and to diagnose serial correlation and heteroscedasticity are detailed below;

Analysis of Result and Discussion of Findings

Analysis of Results

Descriptive Statistics

Table 4.1: Summary Statistics

	CPI (%)	OILP ($)	EXCH(N)	UNEMP (%)
Mean	21.15204	39.96048	115.6556	3.555238
Median	10.75185	28.28500	114.8990	3.790000
Maximum	219.0028	99.67000	425.9792	9.900000
Minimum	0.686099	0.000000	0.617708	0.000000
Std. Dev.	34.32635	30.91786	119.1827	2.909904
Skewness	4.806612	0.521029	1.025345	0.515355
Kurtosis	27.76471	2.085590	3.230143	2.711403
Jarque-Bera	1234.983	3.363556	2.452019	2.004888
Probability	0.000000	0.186043	0.214089	0.366981
Observations	43	43	43	43

Source: Researcher's computation from E-views 11, 2025

Over the period from 1981 to 2023, the average CPI was 21.15%, with a minimum of approximately 0.69% and a maximum of 219%. This reflects the rate at which general prices in the economy rose. On the other hand, the average oil price over the same period was $39.96, with a maximum of $99.67. This signifies the correlation between consumer prices and oil price, where higher oil prices (subsidy removal) often lead to increase in consumer prices, and vice versa.

The average unemployment rate for the study period was 3.55%, with the highest reaching 9.9% and the lowest at 0.0%. These figures provide insights into the levels of unemployment in Nigeria during this time frame. Furthermore, the average exchange rate was N115.65, with a minimum of approximately N0.61 and a maximum of N425.98. This reflects the rate at which Naira was being paid per dollar in Nigeria.

The data's skewness measured how far the distribution deviates from the mean. Positive skewness indicates a longer right tail, while negative skewness indicates a longer left tail. In this analysis, all variables displayed positive skewness, indicating longer right tails in their distributions.

Kurtosis and the Jarque-Bera test assess the tailedness and normality of the distribution. If the Jarque-Bera probability exceeds the typical 5% level of significance, the variable can be considered normally distributed. According to this finding, all variables were normally distributed except inflation which has a p-value less than 0.05. Additionally, two variables, UNEMP (unemployment) and oil price, had kurtosis values less than 3, suggesting that they had fewer extreme values or outliers compared to a normal distribution.

These findings provide a comprehensive understanding of the economic indicators and their distributions, which are crucial for assessing the impact of fuel subsidy removal on CPI in Nigeria during the specified period.

Stochastic and Econometrics Properties of the Series
Unit Root Test
Table 4.2: Unit Root Test Result

Variables	Level		First Difference		Orde of integration
	ADF	P-value	ADF	P-value	
CPI	-14.12496	0.0000	-16.85979	0.0000	1(0)
EXCH	2.863066	1.0000	-4.211353	0.0019	1(1)
OilP	-1.385374	0.5801	-6.675253	0.0000	1(1)
UNEMP	0.192237	0.9688	-5.913806	0.0000	1(1)

Source: Researcher's computation from E-views 11, 2025

This study carried out a unit root test on the variables of interest. This was done to ascertain their stationary properties and to ensure these variables do not exceed order one (I (1)). To achieve this, the study employed the use of Augmented Dicky Fuller (ADF) unit root test. The conclusions and assertions made were based on the rule of thumb which states that, if the P-value is at least less than the 5% significant level, then the variable is stationary.

Based on the results presented in Table 4.2, it was observed that only the CPI exhibited stationarity at level form, with statistical significance at the 5% level. On the other hand, the variables OILP (oil price), exchange rate (EXCH) and UNEMP (unemployment rate) were found to be integrated of order one (I(1)), implying that they became stationary after the first difference, again with statistical significance at the 5% level.
This outcome implies a mixed order of integration among the variables, suggesting the application of the Auto-regressive Distributed Lag (ARDL) method for further analysis in this study.

Lag Length Selection Criteria
Table 4.3: Optimal Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-633.2793	NA	1.83e+09	32.68099	32.85161	32.74221
1	-500.7711	231.0400	4687338.	26.70621	27.55932*	27.01230*
2	-486.4045	22.10244	5242586.	26.78997	28.32557	27.34093
3	-465.1488	28.34094*	4303174.*	26.52045*	28.73853	27.31628

Source: Researcher's computation from E-views 11, 2025

The result of ARDL procedures is sensitive to the lag length, thus the lag length for this model is carefully selected. This model followed the Pesaran et al. (2001) recommendation to use Akaike Information Criterion (AIC) in choosing lag length to determine the lag length structure. Based on the result in Table 4.3, the Akaike information criterion lag length selection suggested the optimal lag length appropriate for model in this study is Lag three (3), with its predictive value of 26.52045*. Thus, this model will be estimated using the optimal lag three (3).

Long-Run Co-Integration Relationship
For this study, considering the various orders of integration observed among the variables, the ARDL *F*-Bounds test was used to determine the presence of a co-integrating equation among the specified variables. The result of this test is presented in Table 4.4.

Table 4.4: F-Bounds Test for Co-integration

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
F-statistic	6.048545	10%	2.72	3.77
K	3	5%	3.23	4.35
		2.5%	3.69	4.89
		1%	4.29	5.61

Source: Researcher's Computation using Eviews 11, 2025

According to the Table 4.4, the *F*-statistic (6.049) is greater than both the 5% Lower-Bound value (3.23) and its Upper-Bound value (4.35). This effectively means that there is a significant long-run relationship in the model or among the variables as they have been specified within the study period.

Based on table 4.4, the null hypothesis is rejected at 10%, 5%, 2.5% and 1% level of significance which mean that the series converge in the long run irrespective of the disequilibrium in the short run.

4.2.4 Diagnostic Tests

In accordance with econometric principles, five diagnostic tests were conducted to assess the accuracy, reliability, and stability of the estimated model. These tests included evaluations for residual normality, serial correlation, heteroscedasticity, specification, and stability. The results of these tests are presented in Table 4.5.

Table 4.5: Diagnostic F tests P-values

Tests	***Prob.***	***Remark***
Residual normality	0.855	The residuals are normal
Serial Correlation	0.668	No serial correlation in the residuals
Heteroscedasticity	0.085	No heteroscedasticity in the model
Ramsey RESET	0.052	Model is well-specified

Source: Researcher's Computation using Eviews 11, 2025

Based on the results of these diagnostic tests, it can be confidently concluded that the estimated model is accurate, reliable, and stable. There is no evidence of residual non-normality, serial correlation, heteroscedasticity, or specification errors, further enhancing the credibility of the model's findings and insights into the relationships between the variables.

ARDL Model

The ARDL model estimation resulted in the generation of two equations: a static short-term equation and a dynamic long-run equation. To determine the optimal lag length, the Akaike information criterion was employed, leading to the selection of a maximum lag 3 for the model.

The static short-term equation and dynamic long-run equation derived from the ARDL model are presented in the subsequent subsections. These equations capture the relationships and dynamics among the variables under investigation, providing insights into the short-term and long-term effects of the independent variables on the dependent variable.

Short-Term Dynamics of the ARDL Model

Table 4.5: ARDL Short run Regression

Variable	***Coefficient***	***Std. Error***	***t-Statistic***	***Prob.***	***Remarks***
OILP	0.007211	0.077651	0.092868	0.9266	*Not Significant*
EXCH	-0.012570	0.052371	-0.240019	0.8119	*Not Significant*
UNEMP	1.708996	2.755310	0.620255	0.5396	*Not Significant*
R-squared	0.751344				
Adjusted R-squared	0.650034				
F-statistic	5.442169	**Durbin-Watson stat**		1.725029	
Prob(F-statistic)	0.000382				
CointEq(-1)*	-0.634799	0.123232	-5.151267	0.0000	*Significant*

Source: Researcher's computation from E-views 11, 2025.

Based on the information presented in Table 4.5, it can be deduced that the combined impact of oil price (subsidy removal), Unemployment (UNEMP) and Exchange rate (EXCH) accounts for approximately 65% of the

variability in CPI, as indicated by the Adjusted R-Squared, this implies that all these variables could only influence 65% variations in CPI while all other variables not included in this model will influence 35%. Furthermore, the statistical significance of the model is confirmed by the F probability value (Fprob. = 0.000, which is less than 0.05).

However, it's important to note that in the short run, all the coefficients of the independent variables are statistically weak. Specifically:

A 1% increase in crude oil prices (as a proxy for fuel subsidy removal) is associated with a 0.7% statistically insignificant increase in the Consumer Price Index (CPI) in the short run. This implies that, in the short term, a rise in oil prices (fuel subsidy removal) positively influences (CPI), though the effect is not statistically significant. This finding is consistent with the study by Wale-Awe and Sulaiman (2020), which also observed a positive relationship between oil prices and inflation.

Furthermore, the effect of the exchange rate (EXCH) on CPI shows that a 1% increase in EXCH results in an insignificant 1.3% decrease in CPI. This implies an adverse relationship between inflation rate and exchange rate in the short run, although the effect is not statistically significant.

The coefficient of Unemployment (UNEMP) is positive and statistically insignificant, indicating that an increase in unemployment leads to an insignificant increase of 170% in CPI in the short run. This finding is contrary to the theoretical expectations of the Philips curve, which suggested a negative relationship between unemployment and inflation.

Furthermore, the error correction term (ECT), which represents the long-run relationship, is both negative and statistically significant. This implies that any deviation of CPI from its equilibrium will be corrected at an annual speed of 63%.

Above all, this model suggests that in the short run, changes in oil prices, exchange rate, and unemployment have specific effects on CPI, although these effects are not statistically significant.

Long Run Relationship Result

Following this evidence from the Bounds test, the long-run coefficients of the ARDL is estimated and provided in Table 4.6.

Table 4.6: Long-Run Coefficients

Variable	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*	*Remark*
OILP	0.634799	0.159791	3.972675	0.0004	*Significant*
EXCH	0.019801	0.079751	0.248291	0.8055	*Not Significant*
UNEMP	-2.171471	3.589774	-0.604905	0.5496	*Not Significant*

Source: Researcher's Computation using Eviews 11, 2025

The long-term estimation results offer valuable insights into the relationship between the independent variables and CPI. Similarly, to the short run, all coefficients were statistically insignificant in the long run, except for Oil price (OilP).

A 1% increase in oil price was found to statistically induce the CPI by 63% in the long run. This implies that as the government reduces or removes fuel subsidies, leading to higher fuel prices, it stimulates consumer prices thereby leading to a sustained increase in general price level, in the long run. This effect is seen as statistically significant. The finding aligns with theoretical expectations and previous research, including the study conducted by Sarmah and Bal (2021), which also found a positive impact of fuel prices on CPI. The rationale behind this is that as oil price increases this translate to higher cost of production which in turn will lead to increase in prices and invariably leading to inflation.

Furthermore, a 1% increase in exchange rate leads to a 2% insignificant increase in CPI during the period under study. This result aligns with the work of Kose and Unal (2021). Unemployment (UNEMP) on the other hand, exhibits a weak negative impact on CPI in the long run. Specifically, a 1% increase in unemployment leads to an insignificant 217% decrease in CPI. This finding validates the Philips curve theory in Nigeria, which suggests a stable and an inverse relationship between the unemployment rate and the rate of inflation.

Overall, this study provides empirical evidence that supports and aligns with economic theories and existing studies, shedding light on the complex interplay between these variables and their impact on inflation rate in Nigeria.

Granger Causality Test

The results of the Pairwise Granger Causality test, as presented in Table 4.7, provide valuable insights into the causal relationships between the variables under consideration. To address the specific objectives of this study, this study will focus on the relationship between oil price, exchange rate, and unemployment:

Table 4.7: Granger Causality result

OILP does not Granger Cause CPI	38	3.13353	0.0294
CPI does not Granger Cause OILP		0.47712	0.7522
EXCH does not Granger Cause CPI	38	1.16775	0.3454
CPI does not Granger Cause EXCH		0.75519	0.5628
UNEMP does not Granger Cause CPI	38	4.62164	0.0052
CPI does not Granger Cause UNEMP		0.98186	0.4328

Source: Researcher's computation from E-views 11, 2025

The results of the Pairwise Granger Causality test provide important insights into the relationships between the variables in this study, particularly in relation to CPI in Nigeria.

1. **Oil Price and CPI:** There is a unidirectional causality from oil price to CPI. This implies that changes in oil prices can significantly influence the level of CPI in the country. In other words, fluctuations in oil prices can serve as a predictor of the country's CPI levels. This finding underscores the impact of oil price movements on CPI in Nigeria. This finding is consistent with the work of Zakaria, Khiam, and Mahmood (2021).
2. **Exchange rate and CPI:** The findings suggest the presence of independent causality between EXCH and CPI. This means that changes in exchange rate in Nigeria cannot be used to predict inflation levels. In other words, high exchange rate does not correspond to lower level of CPI and vice versa. This finding highlights that the relationship between exchange rate and CPI in Nigeria is not statistically significant.
3. **Unemployment and CPI:** The findings suggest the presence of uni-causality between unemployment and CPI. This means that changes in unemployment rate in Nigeria can be used to predict CPI levels. In other words, high unemployment does significantly correspond to lower levels of CPI.

Testing of Hypothesis

The Three-hypotheses formulated earlier in this research work would be tested and resolved in this section.

H_{01}: Fuel subsidy removal has no significant short-term impact on the Consumer Price Index (CPI) in Nigeria.

H_{02}: Fuel subsidy removal has no significant long-term impact on the Consumer Price Index (CPI) in Nigeria.

H_{03}: There is no causality effect between fuel subsidy removal and the Consumer Price Index (CPI) in Nigeria.

Table 4.8: Results for the Resolution of Hypotheses

Series	Test	Co-efficient	P-value	Decision
Oil price on CPI	Short run	0.007211	0.9266	*Positive and insignificant*
	Long run	0.634799	0.0004	*Positive and significant*
Oil price to CPI	Granger Causality	3.13353	0.0294	*Causality exists*

Source: Researcher's Computation using Eviews 11, 2025

Testing Hypothesis 1 and 2: Relationship between Oil Price and CPI

Based on the long-run estimation and a 5% degree of freedom, this study rejects the null hypothesis that there is no significant relationship between oil price and CPI in Nigeria. The p-value of 0.0004 is less than the 5% significance level, indicating a statistically significant relationship between oil price and CPI in the long run. This means that changes in oil prices in Nigeria do indeed have a significant impact on the Nigerian CPI over the long term. This result is consistent with the theoretical expectation and findings gotten by Wale-Awe and Sulaiman, (2020), Goh et al., (2022).

Testing Hypothesis 3: Granger Causality Relationship

The findings in Table 4.7 indicate that oil price indeed Granger-Cause CPI in Nigeria. Therefore, the null hypothesis stating that oil price (fuel subsidy removal) has no significant impact on CPI in Nigeria is not true. Consequently, we reject the null hypothesis at a 5% significance level, indicating that oil price is a significant factor for predicting the level of CPI in Nigeria. This result aligns with the work of Zakaria, Khiam, and Mahmood (2021).

Conclusion

The findings of this study provide valuable insights into the empirical relationship between oil prices (fuel subsidy removal) and the consumer price in Nigeria. Firstly, in the short run, the study reveals that fluctuations in oil prices (fuel subsidy removal) have a statistically insignificant impact on CPI in Nigeria. This suggests that while changes in oil prices may influence short-term inflation dynamics, other factors may also play significant roles in driving inflation levels during this period. However, the long-run analysis presents a contrasting picture, indicating a statistically significant positive relationship between oil prices and CPI in Nigeria. This implies that over an extended period, increases in oil prices lead to sustained inflationary pressures in the economy. Such findings underscore the importance of considering long-term trends and dynamics in economic analyses and policy formulations.

Moreover, the Granger causality analysis reveals intriguing insights into the causal relationships between oil prices and inflation in Nigeria. Specifically, the unidirectional causality from oil prices to inflation suggests that changes in oil prices can serve as predictors of CPI in the country. This highlights the significant influence of global oil market dynamics on domestic inflationary trends and emphasizes the interconnectedness of the Nigerian economy with the global energy market.

Above all, the empirical evidence presented in this study underscores the importance of considering oil price fluctuations as a crucial determinant of CPI in Nigeria.

The study therefore recommends that policymakers and stakeholders need to closely monitor and manage the impact of oil price movements on CPI by adopting proactive inflation management policies to mitigate the adverse effects of oil price-induced inflationary pressures. Measures such as effective monetary policy implementation, targeted fiscal interventions, and supply-side reforms can help stabilize inflation rates and maintain price stability in the economy.

References

Adebayo, T. (2021). The impact of fuel price deregulation on inflation in Nigeria. *Journal of Economic Policy Studies, 15*(3), 45–58.

Adepoju, O. O., Balogun, A. Q., & Bekesuomowei, O. D. (2023). Impact of fuel subsidy removal on gross domestic product and transportation cost in Nigeria. *European Journal of Theoretical and Applied Sciences*, *1*(5), 769-777.

Brown, R., & Green, L. (2019). Inflation dynamics and the role of CPI. *Economic Analysis Quarterly*, 56(3), 334-350.

Greve, H., & Lay, J. (2023). Stepping down the ladder: The impacts of fossil fuel subsidy removal in a developing country. *Journal of the Association of Environmental and Resource Economists*, *10*(1), 121-158.

Harring, N., Jonsson, E., Matti, S., Mundaca, G., & Jagers, S. C. (2023). Cross-national analysis of attitudes towards fossil fuel subsidy removal. *Nature Climate Change*, *13*(3), 244-249.

Ikenga, A. F., & Oluka, N. L. (2023). An examination of the benefits and challenges of the fuel subsidy removal on the Nigerian economy in the fourth republic. *International Journal of Applied Research in Social Sciences*, *5*(6), 128-142.

Köse, N., & Ünal, E. (2021). The effects of the oil price and oil price volatility on inflation in Turkey. *Energy*, *226*, 120392.

Mohammed, A., Yusuf, A. A., Mele, I. B., Yahaya, H., & Olowo-Oribi, F. A. (2024). Evaluating the challenges and prospects of fuel subsidy removal on Nigeria's economy. *Kashere Journal of Politics and International Relations*, *2*(1), 271-279.

Oloko, T. F., Ogbonna, A. E., Adedeji, A. A., & Lakhani, N. (2021). Oil price shocks and inflation rate persistence: A Fractional Cointegration VAR approach. *Economic Analysis and Policy*, *70*, 259-275.

Obi, C. (2023). The politics of protest: The Occupy Nigeria movement and the challenge of inclusive governance. *African Development, 38*(3), 27–40.

Sarmah, A., & Bal, D. P. (2021). Does crude oil price affect the inflation rate and economic growth in India? A new insight based on structural VAR framework. *The Indian Economic Journal*, *69*(1), 123-139.

Smith, A., & Brown, T. (2021). The role of interest rates in monetary policy: Strategies and implications. *Economic Policy Review*, 28(1), 45–62.

Talha, M., Sohail, M., Tariq, R., & Ahmad, M. T. (2021). Impact of oil prices, energy consumption and economic growth on the inflation rate in Malaysia. *Cuadernos de economía: Spanish Journal of Economics and Finance*, *44*(124), 26-32.

Wang, G., Sharma, P., Jain, V., Shukla, A., Shabbir, M. S., Tabash, M. I., & Chawla, C. (2022). The relationship among oil prices volatility, inflation rate, and sustainable economic growth: Evidence from top oil importer and exporter countries. *Resources Policy*, *77*, 102674.

World Bank. (2020). *Nigeria development update: Rising to the challenge.* World Bank Publications.

Zakaria, M., Khiam, S., & Mahmood, H. (2021). Influence of oil prices on inflation in South

Asia: Some new evidence. *Resources Policy*, *71*, 102014.