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Analysis of the Impact of Inflation Rates on Commodity Prices in Nigeria

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Abstract

Persistent inflation in Nigeria poses challenges for commodity prices, economic stability, and welfare, necessitating a clear understanding of its impact on commodity prices for effective policy formulation. This study investigated the impact of inflation rates on commodity prices in Nigeria via an annual time series dataset spanning from 1980 to 2023. The analysis was conducted using the Autoregressive Distributed Lag (ARDL) model. The results revealed a significant positive long-run relationship between inflation rates and commodity prices. Conversely, a negative and significant short-run relationship was observed. Additionally, money supply exerts a positive and significant influence on commodity prices in both the long and short run. Crude oil prices demonstrate a positive long-run connection with commodity. However, food imports, food exports, and interest rates exhibit significant negative long-term relationships with commodity prices. In the short run, food exports and insurgencies are positively and significantly associated with commodity price. Furthermore, a negative relationship was identified between crude oil prices, food imports, interest rates, and commodity prices in the short run. Based on these findings, the study recommends that the government and monetary authorities establish a clear inflation-targeting framework aimed at stabilizing prices and managing inflation expectations.

Keywords: Inflation, commodity prices, ARDL, ECM, money supply

1. Introduction

Commodity prices play a pivotal role in economic development, particularly in developing economies like Nigeria where commodities such as food, fuel, and raw materials constitute a significant portion of national output and trade. As essential drivers of economic growth, fluctuations in commodity prices directly affect the welfare of households, profitability of businesses, government revenue, and overall economic stability (Ajakaiye & Adeyeye, 2012; Samuelson & Nordhaus, 2010). The importance of commodity prices extends to their influence on key macroeconomic indicators, including inflation, exchange rates, and interest rates. Sharp increases in commodity prices, especially those of essential goods such as food and fuel, have profound implications for household welfare and poverty levels. Additionally, businesses reliant on commodity inputs face challenges in cost planning and maintaining profitability under volatile pricing conditions (Fowowe, 2017).

Despite the critical role of commodity prices in the economy, they remain highly susceptible to various factors, including inflation, exchange rate fluctuations, government policies, and global market conditions. In Nigeria, the persistent rise in the general price level, commonly referred to as inflation, has been a major concern for policymakers, businesses, and households alike. Inflation affects commodity prices through cost-push and demand-pull mechanisms, currency depreciation, and changes in monetary supply (CBN, 2019). Over the years, Nigeria has experienced varying levels of inflation driven by structural deficiencies, exchange rate volatility, monetary expansion, and fluctuations in global oil prices (Adeniran, 2016; Eze & Ojo, 2019). This has resulted in unpredictable shifts in commodity prices, particularly food and fuel, making basic necessities unaffordable for many Nigerians (NBS, 2020).

Previous studies have explored the impact of inflation on commodity prices in Nigeria. However, much of the literature has either focused on specific commodities or analyzed inflation as a dependent variable rather than an independent determinant of commodity prices (Ajayi & Olayemi, 2013; Fowowe, 2017). Furthermore, government policies aimed at controlling inflation, such as interest rate adjustments, monetary tightening, and subsidies, have yielded mixed results, often proving ineffective due to poor implementation and sustainability challenges (Saka, 2020). The gap in existing studies lies in the limited understanding of how inflation, as a macroeconomic variable, influences commodity prices across various sectors of the Nigerian economy. This study addresses these gaps by employing the Autoregressive Distributed Lag (ARDL) model to analyze the impact of inflation on commodity prices in Nigeria over the period 1980 to 2023. The ARDL approach is particularly suitable for capturing both short-term and long-term dynamics, providing a comprehensive understanding of how inflation affects commodity prices over different time horizons. The findings from this study will contribute to the existing literature by offering empirical evidence on the relationship between inflation and commodity prices, with particular emphasis on how various commodities respond differently to inflationary pressures. Moreover, the study will inform policymakers on designing effective interventions aimed at stabilizing commodity prices and mitigating the adverse effects of inflation on the economy. The paper is structured as follows: Section 2 presents the literature review, Section 3 outlines the methodology, Section 4 discusses the results, and Section 5 concludes with recommendations.

2. Literature Review

2.1 Conceptual Literature

This section presents the **conceptual literature** on the impact of inflation on commodity prices in Nigeria. It is organized into two parts: the first part explores the **concept and dynamics of inflation**, while the second part focuses on the **concept of commodity prices** and their relevance within the Nigerian economic context.

2.1.1 Concept of Inflation

Inflation is the rate at which the general level of prices for goods and services rises, resulting in the decrease of purchasing power of a currency. It is typically measured annually by indices such as the Consumer Price Index (CPI) or the Producer Price Index (PPI). When inflation occurs, each unit of currency buys fewer goods and services than it did before. Inflation can result from various factors, including demand-pull inflation (increased demand for goods and services), cost-push inflation (rising production costs), and built-in inflation (wage-price spirals) (Mankiw, 2018).

2.1.2 Concept of Commodity Price

Commodity Prices refer to the prices of raw materials and primary agricultural products that are typically traded on global markets. Commodities such as oil, gold, wheat, and coffee are essential for the global economy. Commodity prices are influenced by various factors, including supply and demand dynamics, geopolitical events, and seasonal weather conditions. Changes in commodity prices often have broader implications for inflation since rising costs of raw materials can contribute to higher prices for finished goods and services (Krugman & Wells, 2018).

2.2 Theoretical Framework

The theoretical framework of this study is grounded in the Quantity Theory of Money (QTM), which links money supply, price levels, and economic output. QTM posits that the general price level is directly proportional to the money supply, assuming constant velocity of money and stable real output. When the money supply grows faster than real output, inflation is the inevitable outcome. In Nigeria, this theory is especially relevant due to the frequent use of expansionary monetary policies by the Central Bank of Nigeria (CBN), including lowering interest rates and increasing liquidity to stimulate growth or cover budget deficits (CBN, 2019). While such measures may offer short-term benefits, they often result in inflation if not matched by increased production. Inflation erodes the purchasing power of the naira, raising the cost of essential commodities like food and fuel. Nigeria's dependence on imports worsens this effect, as domestic prices become vulnerable to global market changes and exchange rate fluctuations. QTM also explains how inflation disproportionately affects lower-income households, reducing their access to basic goods and deepening poverty and inequality. This framework illustrates that commodity prices in Nigeria are shaped by both domestic monetary actions and external economic factors. It emphasizes the importance of aligning money supply growth with real output to maintain price stability. In essence, QTM offers a solid foundation for understanding how inflation influences commodity prices and economic welfare in Nigeria.

2.3 Review of Empirical Studies on Impact of Inflation Rates on Commodity Prices

Several studies have examined the relationship between inflation and commodity prices in different countries, using various econometric methods: **Sharma et al. (2024)** analyzed food price inflation in India (2011-2022) using the ARDL model. They found

that money supply, per capita income, agricultural wages, and food prices positively influenced food inflation in both the short and long run. **Shehu et al. (2023)** investigated food prices in Nigeria (1990-2021) with the ARDL model. They identified a significant short-run relationship between oil prices and food inflation, while money supply affected food prices in both the short and long term. Likewise, **Akinbode et al. (2022)** studied Nigeria (1980-2028) using ARDL methods and found a strong positive relationship between oil prices and food price inflation in the short and long run, with exchange rates and money supply impacting food prices in the long run. **Similarly, Kashif et al. (2022)** explored the asymmetric relationship between oil prices and food inflation in Pakistan using the NARDL model. They noted a long-term positive effect of rising oil prices, significant in the short term for increases. Furthermore, **Mustafa (2021)** employed the SVAR model to analyze Turkey (2011-2021). Domestic factors like exchange rates and money supply significantly influenced high food prices, while international oil prices had a lesser impact. **Ertuğrul and Seven (2021) u**sed DCC-GARCH techniques in Turkey (2003-2019) and found a positive relationship between exchange rates and food prices, with a negative impact from oil prices. Also, **Balcilar and Bekun (2020)** used Diebold and Yilmaz spillover index and established a significant positive relationship between agricultural commodity prices and inflation in Nigeria over the period 2006 - 2016, attributing 75% of inflationary pressures to these commodities. In their study **Ajibade et al. (2020)** investigated food price volatility in Nigeria (1970-2019) using GARCH, identifying crop production, economic growth, insurgency, and trade liberalization as key drivers.

Moreover, Shehu et al. (2019) investigated asymmetrical oil price shocks on food prices, concluding that increases in oil prices significantly raised food prices, while decreases had a lesser effect. Additionally, **Sultana and Qayyum (2018)** examined factors influencing food price inflation in Pakistan (1970-2017) using OLS, finding that food imports, GDP, taxes, and exports positively affected food prices, while money supply had a negative relationship. Furthermore, **Hemmati et al. (2018)** analyzed inflation determinants in Iran (1978-2019) with ARDL techniques, concluding that exchange rates, money supply, import prices, and sanctions positively influenced inflation. **Bhattacharya and Sen Gupta (2017)**: Studied food inflation in India (2006-2013), identifying agricultural wage inflation as a key determinant, with fuel inflation playing a moderate role. These studies highlight the complex dynamics between inflation, commodity prices, and various macroeconomic factors across different countries. The above-reviewed studies reveal mixed findings concerning the relationship between inflation, macroeconomic variables, and commodity prices. While several studies highlight the significant positive influence of money supply and oil prices on commodity prices (Shehu et al., 2023; Akinbode et al., 2022; Kashif et al., 2022), others

report conflicting results, especially concerning the role of exchange rates (Mustafa, 2021; Ertuğrul & Seven, 2021). Additionally, most studies tend to focus on food price inflation, with limited attention to the broader spectrum of commodities. The current study seeks to address these gaps by employing a comprehensive dataset from 1980 to 2023, using the ARDL model to examine the impact of inflation rates on commodity prices in Nigeria. This approach provides a more robust understanding of the long-term and short-term dynamics between inflation and commodity prices, particularly in the

context of Nigeria's unique economic environment characterized by dependency on imports, exchange rate volatility, and fluctuating oil prices.

3. Methodology

This study employed secondary data spanning the period 2000 to 2023, a timeframe that captures significant global and national events such as the 2008 global financial crisis, the COVID-19 pandemic, and periods of insurgency in Nigeria. These events have profoundly impacted both inflation rates and commodity prices, making this time span suitable for analyzing the dynamic relationship between them. Commodity Prices (Dependent Variable) was sourced from the Central Bank of Nigeria (CBN) and the World Bank Indicators (WBI), and measured using the Producer Price Index (PPI). The PPI reflects the average changes in prices received by domestic producers for their output, offering a reliable measure of commodity price movements from the producers' perspective. Inflation Rate (Independent Variable) was measured by the Consumer Price Index (CPI), which tracks the annual percentage change in the cost of acquiring a fixed basket of goods and services. This approach is consistent with the World Development Indicators (2023) from the World Bank. Inflation Rate (IV) represents the general rise in prices over time. An increase in inflation is expected to exert upward pressure on commodity prices in the long run, as producers pass increased input costs on to consumers. In the short run, however, other factors like supply shocks or geopolitical issues may dominate. Commodity Prices (DV): As measured by the PPI, these reflect the changes in prices producers receive. The relationship with inflation is positive in the long run, as persistent inflation leads to increased production costs and price adjustments. In the short run, commodity prices may deviate due to external shocks, market sentiment, or supply chain disruptions. This study adapts model with modification in line with the work of Sharma, Meena, and Anwer (2024). The functional model is specified as:

$$CMP = f(INFR\ CRP, CPR, FDIM, FDEX, INR, MS, INS) \quad \ldots\ldots (3.1)$$

Where: *"CMP"* is commodity price, "*INFR*" denotes inflation rates, "*CRP*" represents crude oil price, "*CPR*" is crops production, "*FDIM*" signify food import, "*FDEX*" is food export, "*INR*" denote interest rates, "*MS*" symbolizes money supply, "*INS*" denotes insurgence. The functional model can be restated into mathematic model:

$$CMP_t = \beta_0 + \beta_1 INFR_t + \beta_2 CRP_t + \beta_3 CPR_t + \beta_4 FDIM_t + \beta_5 FDEX_t + \beta_6 INR_t + \beta_7 MS_t + \beta_8 INS_t \ldots (3.2)$$

Where: "*t*" is the time series variance, " β_0" represent the constant parameters, and "$\beta_1 - \beta_8$" are the parameters to be estimated. Thus, the mathematical equation can be

restated into econometric model to captured the error term. The econometric model is specified as:

$CMP_t = \beta_0 + \beta_1 INFR_t + \beta_2 CRP_t + \beta_3 CPR_t + \beta_4 FDIM_t + \beta_5 FDEX_t + \beta_6 INR_t + \beta_7 MS_t + \beta_8 INS_t + \mu_t$ ……….(3.3)

Where: "μ_t" is the error term or disturbance term. However, the equation 3.3 can be restated to capture the natural log of the parameter to be estimated as follows:

$lCMP_t = \beta_0 + \beta_1 lINFR_t + \beta_2 lCRP_t + \beta_3 lCPR_t + \beta_4 lFDIM_t + \beta_5 lFDEX_t + \beta_6 lINR_t + \beta_7 lMS_t + \beta_8 lINS_t + \mu_{t..}$(3.4)

Where: "*lINFR*" denotes logarithms of inflation rates, "*lCRP*" represents logarithms of crude oil price, "*lCPR*" is logarithms of crops production, "*lFDIM*" signify logarithms of food import, "*lFDEX*" is logarithms of food export, "*lINR*" denote logarithms of interest rates, "*lMS*" symbolizes logarithms of money supply, "*INS*" denotes logarithms of insurgence. Although inflation and interest rates are expressed as percentages, logging them reduces heteroscedasticity, manages extreme values during high volatility, and allows coefficients to be interpreted as elasticities, making percentage change interpretations more straightforward (Gujarati, & Porter, 2009; Wooldridge, 2016).

The data analysis employs both descriptive and inferential statistical techniques. Descriptive statistics are used to summarize the characteristics of each variable. These statistics provide insights into the distribution, central tendency, and dispersion of the data, assisting in the identification of patterns and potential outliers. For inferential analysis, the study applies multicollinearity test, unit root test, and ARDL techniques. Multicollinearity is assessed through correlation analysis, which identifies strong linear relationships between independent variables. High correlations (close to +1 or -1) indicate multicollinearity, potentially leading to inflated standard errors and unreliable coefficient estimates (Gujarati, 1995). Additionally, the stationarity of the time series data is examined using unit root tests such as Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. These tests determine whether the variables are stationary or require differencing to achieve stationarity. Non-stationary variables can result in spurious regressions (Philips, 1988; Granger, 1988). The ADF test is specified as:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \sum_{k=1}^{m} Y_i \, \Delta Y_{t-1} + \mu_t \quad \ldots (3.5)$$

Where: $\Delta Y_t =$ First difference of Y_t, Y_{t-1} represent the Lagged value of Y_t, δ denotes the Test coefficient, μ_t is the Error term, β_1 is the Constant, and β_2 represent the Coefficient of the time variable. The PP test (1988) equation is specified as.

$$\Delta \mathrm{CMP}_t = \partial_t + \beta_t + (\rho - 1)\gamma_{t-1} + \varepsilon_t \quad \ldots (3.6)$$

Where: CMP_t = Commodity prices is the variable of interest, ∂_t = the intercept, β_t = the linear time trend, Δ = the first difference operator, ε_t = the error term with zero mean and constant variance. The purpose of using ARDL in this study is that; the model is

applicable even if the series under investigation are stationary at I (0) or I (1) or a mixture of both. Secondly, it provides a robust and high reliable quality result even if the sample size is large or small. Finally, the approach takes into consideration the error correction model **(Pesaran, Shin, & Smith 2001)**. The ARDL model is specified as:

$$\Delta lCMP_{t-1} = \beta_0 + \sum_{i-1}^{m} \beta_1 lCMP_{t-1} + \sum_{i-1}^{m} \beta_2 lINFR_{t-1} + \sum_{i-1}^{m} \beta_3 lCRP_{t-1} + \sum_{i-1}^{m} \beta_4 lCPR_{t-1} + \sum_{i-1}^{m} \beta_5 lFDIM_{t-1} + \sum_{i-1}^{m} \beta_6 lFDEX_{t-1} + \sum_{i-1}^{M} \beta_7 lINR_{t-1} + \sum_{i-1}^{m} \beta_8 LMS_{t-1} + \sum_{i-1}^{M} \beta_9 lINS_{t-1} + \beta_1 \Delta lCMP_{t-1} + \beta_2 \Delta lINFR_{t-1} + \beta_3 \Delta lCRP_{t-1} + \beta_4 \Delta lCPR_{t-1} + \beta_5 \Delta lFDIM_{t-1} + \beta_6 \Delta lFDEX_{t-1} + \beta_7 \Delta lINR_{t-1} + \beta_8 \Delta lMS_{t-1} + \beta_9 \Delta lINS_{t-1} + \gamma ECM_{t-1} + \mu_t \ldots\ldots\ldots (3.7)$$

From the above ARDL model, *LCMP, LINFR, LCRP, LCPR, LFDIM, LFDEX, LINR, LMS,* and *LINS* stands for the lag length of the long run, the short run effect of the impact of inflation rates on commodity price in Nigeria are detected by the sign and significance of Δs, also the sign and significance of $\beta_1$normalized on β_9 showing the long run effects. The ARDL cointegration bound test is specified as:

$$Y_t = \alpha + \sum_{i=1}^{p} \beta_1 Y_{t-i} + \sum_{i=1}^{q} \beta_2 X_{t-i} + \mu_t \ldots\ldots\ldots (3.8)$$

Where: Y_t is the dependent variable, X_{t-i} represent the independent variable, p denotes the maximum lag length of the dependent, p is the maximum lag length of the independent variable, α represent the constant term, $\beta_1 - \beta_2$ represent the coefficient of the parameters to be estimated, while μ_t denotes the error term. Causality was employed to test for the causal relationship between the parameters. This is specified as follows:

$$X_t = \alpha_1 + \sum_{k=1}^{m} \beta_1, KX_{t-k} + \sum_{k=1}^{m} \beta_1, K\ Y_{t-k} + \sum_{k=1m}^{m} X_t \ldots\ldots\ldots (3.9)$$

$$Y_t = \delta_2 + \sum_{k=1}^{m} \delta_2, K\ Y_{t-k} + \sum_{k=1}^{m} \delta_2, K\ X_{t-k} + \sum_{k=1}^{m} Y_t \ldots\ldots\ldots (3.10)$$

The above Granger causality equation describes the Granger causality association inflation and commodity prices in Nigeria.

4. Results and Discussions

Table 4.1: Results of the Descriptive Analysis

Varbs.	Mean	Media	Max	Min	Std.Dev.	Skew.	Kurt.	Obs.

CMP	1.364	1.669	2.441	-0.142	0.837	-0.571	1.857	44
INFR	18.87	12.94	72.84	5.389	16.15	1.903	5.619	44
CRP	0.987	1.199.	2.501	-0.976	1.167	-0.465	1.843	44
FDIM	10.23	10.18	10.78	9.592	0.386	0.011	1.572	44
FDEX	10.42	10.35	11.06	9.712	0.383	0.106	1.709	44
INR	17.05	16.89	31.65	8.432	4.913	0.346	3.489	44
MS	1.250	1.274	1.943	0.142	0.367	-0.903	4.270	44
INS	0.943	0.928	1.425	0.383	0.288	-0.172	1.700	44

Source: Author's Computation EViews 12

Table 1 presents the descriptive statistics for inflation rates and commodity prices in Nigeria. The average inflation rate is 1.3, while the average commodity price is 18.8. The inflation rate ranges from -0.1 to 72.8, indicating periods of significant economic instability, whereas commodity prices range from 5.3 to 2.4, demonstrating greater stability. The standard deviation for inflation rates is 16.1, reflecting considerable volatility due to economic instability, policy changes, and external shocks. In contrast, commodity prices have a lower standard deviation of 0.8, suggesting relative stability driven by more predictable supply and demand factors. Overall, the results indicate that while commodity prices are relatively stable, inflation rates are prone to extreme variations often influenced by broader economic and geopolitical factors.

Table 4.2: Results of Multicollinearity Test (Correlation Analysis)

Varbls.	LCMP	INFR	LCRP	LFDIM	LFDEX	INR	LMS	LINS
LCMP	1	0.392	0.244	0.015	0.091	0.158	0.254	-0.202
INFR	0.392	1	0.385	0.109	-0.052	0.013	0.047	-0.005
LCRP	0.244	0.385	1	0.333	0.631	0.305	0.227	-0.383
LFDIM	0.015	0.109	0.333	1	0.765	-0.237	0.416	-0.043
LFDEX	0.091	-0.052	0.631	0.765	1	0.146	0.579	-0.225
INR	0.158	0.013	0.305	-0.237	0.146	1	0.030	-0.035
LMS	0.254	0.047	0.227	0.416	0.579	0.030	1	0.077
INS	-0.202	-0.005	-0.383	-0.043	-0.225	-0.035	0.077	1

Source: Author's Computation EViews 12

Table 4.2 revealed the results of the multicollinearity via correlation analysis. Evidence from the findings suggested that there is no presence of multicollinearity among the parameters used in this model. As evident by the coefficient correlation of less than 0.70 across all the parameter employ in this model. Multicollinearity arises when two or more independent variables are highly correlated, typically when correlation coefficients exceed ±0.8 or ±0.9 (Gujarati & Porter, 2009). High multicollinearity can distort the estimation of regression coefficients, inflate standard errors, and weaken the statistical

significance of predictors. In this study, none of the correlation coefficients exceed the 0.8 threshold, suggesting that multicollinearity is not a serious issue.

Table 4.3: Result of the Augmented Dickey Fuller (ADF) Unit Root Test

Augmented Dickey Fuller Test (ADF)

	Level				First Diff.			
Var.	Inter.	P-value	Trend	P-value	Inter.	P-value	Trend	P-value
LCMP	-1.76	0.39	-1.77	0.96	-3.80	0.00***	-4.032	0.01**
INFR	-2.03	0.04**	-3.08	0.12	-12.2	0.00***	-5.269	0.00***
LCRP	-1.20	0.66	-1.45	0.83	-7.13	0.00***	-8.421	0.00***
LFDI	-0.87	0.79	-2.52	0.32	-6.61	0.00***	-6.720	0.00***
LFDE	-0.96	0.76	-2.80	0.20	-6.36	0.00***	-6.256	0.00***
INR	-2.40	0.01	-2.21	0.48	-7.14	0.00***	-7.358	0.00***
LMS	-5.27	0.00***	-5.18	0.00***	-22.6	0.00***	-25.79	0.00***
LINS	-1.53	0.51	-1.87	0.65	-7.21	0.00***	-7.158	0.00***

Source: Author's Computation, Eviews 12, Significant at 1%(***), 5%(***), 10(*),

Table 4.4: Result of the Philip Perron (PP) Unit Root Test

Philip Perron (PP) Unit Root Test

	Level				First Diff.			
Var.	Inter.	P-value	Trend	P-value	Inter.	P-value	Trend	P-value
LCMP	-1.76	0.39	-0.77	0.96	-3.80	0.00***	-4.03	0.01**
INFR	-3.02	0.04**	-3.08	0.12	-12.1	0.00***	-12.80	0.00***

LCRP	-1.20	0.66	-1.45	0.83	-7.13	0.00***	-8.42	0.00***
LFDI	-0.87	0.79	-2.51	0.31	-6.60	0.00***	-6.72	0.00***
LFDE	-0.95	0.76	-2.80	0.20	-6.36	0.00***	-6.26	0.00***
INR	-2.40	0.14	-2.20	0.48	-7.14	0.00***	-7.36	0.00***
LMS	-5.27	0.00***	-5.18	0.00***	-22.6	0.00***	-25.0	0.00***
LINS	-1.53	0.50	-1.87	0.65	-7.20	0.00***	-7.16	0.00***

Source: Author's Computation, Eviews 12, Significant at 1%(***), 5%(***), 10(*)

Table 4.3 and 4.4 revealed the results of the Augmented Dickey-Fuller and Philips Perron unit root test. The result shows that all variables were all stationary at a level value 1(0) and after first difference and I(1) respectively. This is inconformity with the ARDL model requirement. The coefficient of all the variable employed in this study were negative and statistically significant which are expected for the unit roots test.

Table 4.5: Results of the Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-2823.4	NA	2.17e+51	138.07	138.36	138.17
1	-2613.8	337.52	8.88e+47	130.23	132.57*	131.08
2	-2523.4	76.581*	6.31e+47	129.68	134.06	131.27
3	-2484.5	63.853	4.49e+47*	128.70*	135.14	131.05*

Source: Author's computation, Eviews 12

Table 4.5 present the results of the lag length selection criteria, that is the lag length to be included in the model. The results revealed that the optimal lag length for the model is 3. This is based on the fact that lag 3 has the lowest values for the Schwarz Criterion (SC) and Hannan-Quinn Criterion (HQ); smaller values indicate a better model fit. Also, most of these selection criteria suggest using a lag of 3.

Table 4.6: Results of the Co-integration Bound Test

Test Stat.	Value	Sign. Level	Upper Bound 1(1)	Lower Bound 1(0)
F-Statistics	6.7	1%	3.9	2.7
K	7	5%	3.2	3.2

	10%	2.9	1.9

Significant at 1%(***), 5%(***), 10(*)

Source: Author's Computation, Eviews 12

Table 4.6 present the results of the long run cointegration between inflation rate and commodity prices. The result of the ARDL cointegration bound test revealed existence of co-integration among the time series variable. This is because the F-statistic of 6.7 is

larger than the upper bound I(1) of 3.9, 3.2, 2.9 at 1%, 5%, 10% and the lower bound I(0) of 2.7, 3.2, 1.9 at both 1%, 5%, 10% level of significance. This suggest that all the variable have long run equilibrium that kept them together in the long run. That is to say all the variables moves together in the same direction.

Table 4.7: Result of the ARDL Estimation Test (Long run and short run Estimate)

Dependent Variable: EXR

Ind. Variables	Coefficient	Std. Error	t-Statistic	P-value
INFR	0.0025	0.0010	2.3098	0.0462**
LCRP	0.6394	0.1899	3.3670	0.0083***
LFDIM	-0.4020	0.1455	-2.7613	0.0221**
LFDEX	-0.3898	0.1968	-1.9802	0.0790*
INR	-0.0191	0.0071	-2.7032	0.0243**
LMS	0.3237	0.0786	4.1164	0.0026***
LINS	-0.2474	0.1421	-1.7399	0.1159
ΔINFR	-0.0025	0.0010	-2.3098	0.0462
ΔLCRP	-0.7166	0.2355	-3.0418	0.0140**
ΔLFDIMP	-0.4020	0.1455	-2.7613	0.0221**
ΔLFDEX	0.7454	0.2392	3.1160	0.0124**
ΔINR	-0.0057	0.0036	-1.5746	0.1498
ΔLMS	0.1483	0.0441	3.3593	0.0084***
ΔLINS	0.2047	0.0822	-2.4893	0.0345**

C	6.6360	2.1157	3.1364	0.0120**
ECM	-0. 7165	0.0670	-10.682	0.0000***

$R^2 = 0.93$, Adjusted $R^2 = 0.86$, Dubin Watson Statistics = 2.92, F-Statistics = 290.83 (0.0000)

Source: Author's Computation, Eviews 12, Significant at 1%(***), 5%(**), 10%(*)

Table 4.7 shows the result of the long run and short run ARDL estimation on the impact of inflation rate on commodity prices in Nigeria. There is a positive and significant long-run relationship between inflation and commodity prices, meaning that as inflation rises, commodity prices tend to increase. Factors like demand-pull inflation and investor behavior (viewing commodities as a hedge against inflation) contribute to this relationship. The short-run relationship is negative, suggesting in the short run, commodity prices may be influenced more by supply and demand fluctuations, geopolitical events, or cost-push factors (e.g., rising production costs) rather than inflation alone. In the long run, higher crude oil prices have a positive effect on commodity prices, as oil price increases stimulate government spending and contribute to inflation. However, in the short run, rising oil prices may increase production costs, leading to a negative impact on commodity prices. Both food imports and money supply have a positive long-run relationship with commodity prices. An increase in money supply boosts consumer and business spending, increasing demand for commodities. Interest rates negatively impact commodity prices in the long run. Rising interest rates increase borrowing costs, reduce consumer spending, and lower investment in commodity production, leading to reduced demand for commodities. Insurgencies have a non-significant long-term impact on commodity prices, suggesting that the Nigerian commodity market has developed resilience to disruptions. However, in the short run, insurgencies can cause supply disruptions, leading to higher commodity prices.

In the short run, a rise in food exports can drive up prices, especially if there is strong international demand for agricultural commodities. This finding supports the idea that international demand can influence local prices in the short term. There is a non-significant short-run relationship between interest rates and commodity prices. In the short run, immediate factors like supply and demand, seasonal fluctuations, and geopolitical events play a more prominent role than interest rates. In summary, the relationship between inflation and commodity prices in Nigeria is complex, with long-run positive effects and short-run negative effects. Other factors like crude oil prices, food imports, and interest rates also play crucial roles in shaping commodity price trends. Short-run disruptions, such as insurgencies, can impact prices, but overall, the market has shown resilience to these shocks.

Table 4.8: Result of the Pairwise Granger Causality Test

Null Hypothesis	Obser.	F-statistics	P-value

INFR does not granger cause LCMP	42	1.9726	0.1535
LCMP does not granger cause LINFR	42	5.7096	0.0069***

Source: Author's Computation, Eviews 12, Significant at 1%(***), 5%(**), 10%(*)

Table 2 presents the results of the pairwise Granger causality tests examining the causal relationships between inflation rates and commodity prices. The findings reveal that there

is no significant Granger causality between inflation rates and commodity prices in either direction. This suggests that past values of inflation do not significantly predict future commodity prices, and vice versa. The absence of causality implies that fluctuations in inflation rates are not a reliable predictor of changes in commodity prices within the period studied. Therefore, the null hypothesis, which states that inflation rates do not Granger-cause commodity prices, is accepted, and the alternative hypothesis is rejected.

Table 4.9: Results of the Diagnostic Test

Test	F-statistics	P-value
Heteroscedasticity	0.4901	0.9264
Normality Test	0.6053	0.5522
Serial Correlation LM Test	3.2707	0.1948

Author's Computation Eviews 12.5

Table 4.9 displays the results of the diagnostic tests conducted, which included tests for heteroskedasticity, the Breusch-Godfrey serial correlation LM test, and a normality test. The results showed no evidence of heteroskedasticity or serial correlation among the variables, as the probability values for all tests were statistically non-significant.

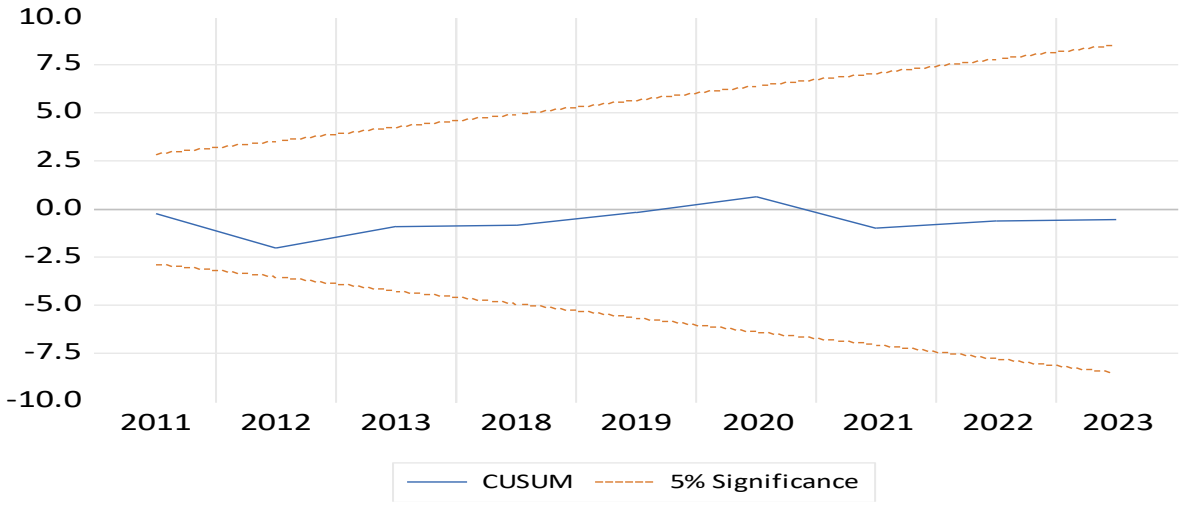

Figure 4.1: QUSUM Test

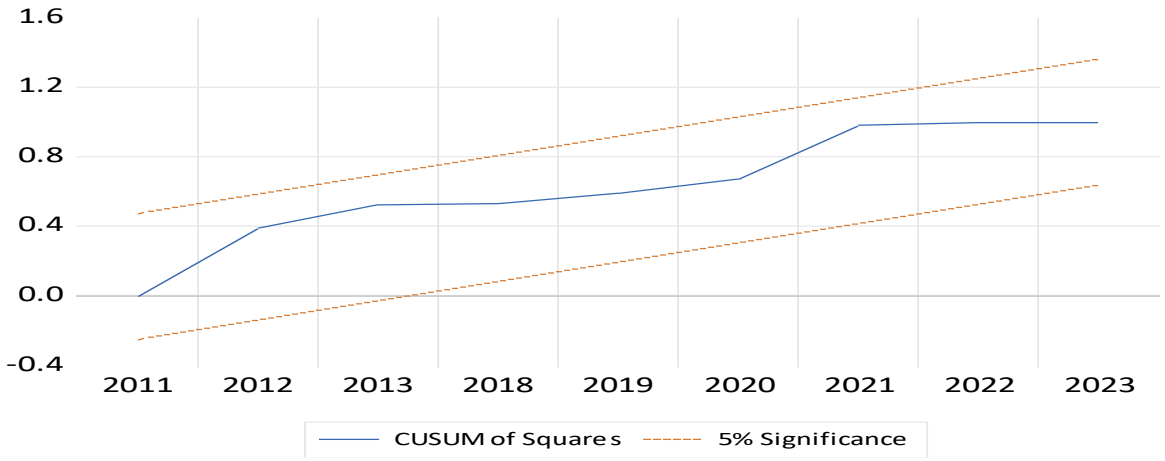

Figure 4.2: CUSUM-Q Test

Fig. 4.1 and 4.2 shows that the result of the stability test using Cusum and Cusum of squares test. The result from the Cusum and Cusum of squares test revealed that the estimated parameters under study were stable; this is because the sums of recursive errors for both the test fall between the two critical lines of the CUSUM and CUSUM of squares test. This implies that there is no structural break over the period of the study among the parameters under investigation.

5. Conclusion and Policy Recommendation

The study investigates the impact of inflation on commodity prices in Nigeria using both short-run and long-run ARDL estimations and Granger causality analysis. The findings indicate a positive and statistically significant long-run relationship between inflation and commodity prices, suggesting that over time, rising inflation contributes to higher commodity prices. This is likely due to mechanisms such as demand-pull inflation and investor behavior that favors commodities as an inflation hedge.

In contrast, the short-run relationship between inflation and commodity prices is negative, implying that short-term price changes are more influenced by supply-demand fluctuations, geopolitical events, and cost-push factors rather than inflation alone. Variables such as crude oil prices, money supply, and food imports show a positive long-run effect, while interest rates have a negative long-run impact. Insurgencies and food exports show short-run significance due to their disruptive effects on supply and market dynamics. Interestingly, the Granger causality test results show no significant causal relationship between inflation and commodity prices in either direction. This suggests that while inflation correlates with commodity prices over the long term, it does not necessarily *cause* those changes, and vice versa. The study recommends the need for policymakers should control inflation through sound economic policies, manage oil revenues efficiently, and invest in local agriculture to reduce import dependence. Ensuring stable interest rates and money supply, while addressing short-term shocks, can help stabilize commodity prices.

While there are numerous macroeconomic variables that influence commodity prices beyond inflation, this study addresses this limitation by focusing on the most **decisive factors** affecting commodity prices in Nigeria. Specifically, the analysis includes key variables such as **crop production, food imports, food exports, interest rates, money supply, and insurgencies**, which are considered highly relevant to the Nigerian context and have significant potential to impact commodity price trends. Nevertheless, future studies should integrate models that account for structural changes in the Nigerian economy, such as economic reforms or global crises (e.g., COVID-19, Russia-Ukraine war). Examine the impact of inflation on sector-specific commodity prices, like agriculture, energy, and metals, for more nuanced insights. Extend the analysis to a cross-country panel study within Sub-Saharan Africa to compare results and explore regional patterns.

Reference

Adeniran, A. I. (2016). Exchange rate volatility and economic growth in Nigeria. *African Journal of Economic Review, 4*(2), 124-138.

Ajakaiye, O., & Adeyeye, V. A. (2012). Concepts, measurement and causes of poverty. *Central Bank of Nigeria Economic and Financial Review, 39*(4), 8-44.

Ajayi, S. I., & Olayemi, A. A. (2013). The impact of inflation on commodity prices in Nigeria: A sectoral analysis. *Journal of Economic Studies, 10*(3), 45-62.

Ajibade, A., Bakare, T., & Olowu, A. (2020). Analysis of food price volatility in Nigeria from 1970 to 2019 using the GARCH approach. *Journal of Agricultural Economics, 45*(3), 245-260.

Akinbode, A., Adekunle, O., & Yusuf, I. (2022). Oil prices and food price inflation in Nigeria: Evidence from ARDL methods (1980–2028). *African Journal of Economic Policy, 29*(1), 101-121.

Balcilar, M., & Bekun, F. V. (2020). Agricultural commodity prices and inflation in Nigeria: Evidence from the Diebold and Yilmaz spillover index (2006–2016). *Economic Modelling, 94*, 12-20.

Bhattacharya, R., & Sen Gupta, A. (2017). Drivers of food inflation in India (2006–2013). *Journal of Economic Analysis, 55*(2), 132-150.

Central Bank of Nigeria (CBN). (2019). *Annual report and financial statements 2019*. Abuja, Nigeria: Central Bank of Nigeria.

Eze, C., & Ojo, M. O. (2019). Structural deficiencies and inflation in Nigeria: A critical review. *Journal of Monetary Economics and Finance, 15*(2), 98-115.

Fowowe, B. (2017). Commodity price volatility and economic growth in Nigeria. *Journal of Development Studies, 53*(1), 45-63.

Granger, C. W. J. (1988). Some recent developments in a concept of causality. *Journal of Econometrics, 39*(1-2), 199-211.

Gujarati, D. N. (1995). *Basic econometrics* (3rd ed.). New York , NY: McGraw-Hill.

Hemmati, M., Khoshnevis, H., & Ghahramani, E. (2018). External determinants of inflation in Iran (1978–2019): Evidence from ARDL techniques. *Iranian Economic Review, 24*(3), 55-73.

Kashif, M., Rashid, A., & Ahmad, N. (2022). Asymmetric relationship between oil prices and food inflation in Pakistan: Evidence from NARDL model. *Pakistan Economic Review, 28*(2), 101-118.

Krugman, P., & Wells, R. (2018). *Microeconomics* (5th ed.). Worth Publishers.

Mustafa, O. (2021). Drivers of high food prices in Turkey: A structural vector auto regression approach (2011–2021). *Journal of Economic Policy Research, 34*(1), 89-110.

Mankiw, N. G. (2018). *Principles of Economics* (8th ed.). Cengage Learning.

National Bureau of Statistics (NBS). (2020). *Nigeria's consumer price index report*. Abuja, Nigeria: National Bureau of Statistics.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics, 16*(3), 289-326. doi:10.1002/jae.616

Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika, 75*(2), 335-346.

Samuelson, P. A., & Nordhaus, W. D. (2010). *Economics* (19th ed.). New York, NY: McGraw-Hill.

Saka, J. O. (2020). The effectiveness of monetary policy in curbing inflation in Nigeria. *Journal of Economics and Public Policy, 12*(4), 78-95.

Sharma, R., Meena, S., & Anwer, M. (2024). The impact of macroeconomic variables on food price inflation in India using the ARDL model (2011–2022). *Indian Journal of Economics and Development, 39*(4), 401-419.

Shehu, M., Idris, A., & Bello, S. (2019). The impact of asymmetrical oil price shocks on food prices in Nigeria. *Journal of Economic Analysis, 44*(1), 89-107.

Shehu, M., Idris, A., & Bello, S. (2023). The dynamic effects of inflation on food prices in Nigeria (1990–2021): Evidence from ARDL model. *Nigerian Journal of Economic Studies, 45*(2), 101-122.

Sultana, S., & Qayyum, A. (2018). Factors influencing food price inflation in Pakistan (1970–2017). *Journal of Economic Research, 30*(2), 199-212.

Wooldridge, J. M. (2016). *Introductory econometrics: A modern approach* (6th ed.). Boston, MA: Cengage Learning.