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Analysis of the Impact of Food Import on Commodity Prices in Nigeria

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Abstract

As Nigeria grapples with inflation and external shocks, understanding the drivers of commodity price movements has become increasingly important for policymakers. This study investigated the impact of food imports on commodity prices in Nigeria from 2020 to 2024 using an Autoregressive Distributed Lag (ARDL) model to analyze both short- and long-run relationships. The results show that food imports and money supply have a significant positive long-run effect on commodity prices, as increased liquidity stimulates demand. Inflation also contributes positively in the long run, although it exerts a negative influence in the short term due to supply shocks, geopolitical instability, and other transient factors. Crude oil prices emerge as a key driver, positively affecting commodity prices in the long run through increased government spending and inflationary pressure. However, in the short run, higher oil prices raise production costs, dampening price levels. Interest rates negatively affect commodity prices in the long run by curbing investment through higher borrowing costs, while their short-run effect is negligible. Insecurity does not have a significant long-term impact, suggesting market resilience, though it triggers short-term supply disruptions and price volatility. Inclusive, the study highlights the influence of macroeconomic variables particularly inflation, oil prices, and money supply on Nigeria's commodity market. Despite short-run volatility driven by factors like insecurity and cost-push pressures, the market shows long-term stability. The study urges Nigerian policymakers to adopt a clear inflation-targeting framework, enabling the Central Bank to stabilize commodity prices and manage inflation through flexible monetary tools.

Keywords: Food, import, commodity prices, ARDL, ECM, money supply

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1. Introduction

Food security and commodity price stability are critical concerns for many developing economies, particularly those with large and growing populations. In sub-Saharan Africa, agriculture remains a central pillar of economic development, poverty reduction, and nutritional well-being. Nigeria, as one of the largest and most populous countries in Africa, exemplifies the complex challenges associated with achieving food security amid economic volatility and global supply chain disruptions. Despite its vast arable land, favorable climatic conditions, and significant labor force, Nigeria continues to struggle with low agricultural productivity. Over the years, the country has failed to meet domestic food demand through local production, resulting in a growing dependence on food imports. This dependency places considerable strain on foreign exchange reserves, widens the trade deficit, and exposes the economy to global food price fluctuations (FAO, 2022; World Bank, 2023). The prices of staple commodities such as rice, maize, and wheat have exhibited considerable volatility, influenced by external factors like global market trends and currency depreciation, as well as internal issues including insecurity, poor infrastructure, and supply chain inefficiencies (Adeniran & Yusuf, 2021).

In response to these challenges, the Nigerian government has launched several policy interventions aimed at revitalizing agriculture and reducing reliance on food imports. Programs such as the Agricultural Transformation Agenda and the Anchor Borrowers' Programme have sought to enhance local food production through credit access, subsidies, and institutional support (CBN, 2020). Additionally, trade measures including import bans and tariffs have been used to protect local producers. However, the effectiveness of these interventions remains contested. While intended to foster self-sufficiency, such measures have at times contributed to inflationary pressures and supply shortfalls, especially when domestic production fails to meet demand (Ajakaiye & Fakiyesi, 2019).

Although there is a growing body of literature on agricultural policies, food inflation, and the effects of currency fluctuations in Nigeria, few studies have directly examined the empirical relationship between food imports and commodity prices. For instance, Ajakaiye & Fakiyesi (2019) focused on trade policy impacts on inflation, while Adeniran & Yusuf (2021) analyzed the influence of exchange rate movements on food price volatility. However, these studies did not explicitly explore how food import levels interact with domestic commodity prices, leaving a gap in the literature that this study seeks to fill. This research is particularly timely given the rising concerns over food inflation, global supply chain fragility, and Nigeria's continuing dependence on food

imports amid macroeconomic uncertainty. Understanding how food imports influence commodity prices is crucial for crafting policies that promote price stability, protect consumers' purchasing power, and enhance food security.

Therefore, this study aims to empirically analyze the relationship between food imports and commodity prices in Nigeria from 2020 to 2024. By applying an Autoregressive Distributed Lag (ARDL) model, it investigates both short-run and long-run effects, offering evidence-based insights for policymakers, stakeholders, and researchers. The paper is organized into five sections: Section One presents the introduction; Section Two reviews relevant literature; Section Three outlines the research methodology; Section Four discusses the results; and Section Five provides conclusions and policy recommendations.

2. Literature Review

2.1. Concept of Food Import

Food imports refer to the purchase and movement of food products from foreign countries into domestic markets to meet consumption needs. This process is influenced by factors such as domestic agricultural output, consumer demand, and international trade policies. These imports include a wide range of products like grains, fruits, vegetables, meat, dairy, and processed foods (OECD, 2021). Countries like Nigeria face significant challenges in producing sufficient food due to climate conditions, land availability, and resource constraints. Moreover, globalization has diversified consumer preferences, increasing demand for food items not produced locally (Adeniran & Yusuf, 2021). Food imports help stabilize markets during periods of insufficient local supply or seasonal fluctuations.

However, heavy reliance on food imports poses economic challenges. It can contribute to trade deficits and pressure foreign exchange reserves, especially when food imports constitute a large share of total imports (World Bank, 2023). Dependence on imported food also exposes the economy to inflation risks from rising global prices or currency depreciation. Additionally, food imports create competition for local farmers, which may affect their profitability but also incentivize productivity improvements (Ajakaiye & Fakiyesi, 2019). To protect domestic agriculture, governments often use tariffs, quotas, and subsidies. Dependence on food imports increases vulnerability to global market volatility and supply chain disruptions, which can threaten long-term food security and sustainable agricultural development. International trade agreements

and food safety regulations further influence the volume and types of imports by setting tariffs, quotas, and standards (CBN, 2020).

Staple commodity prices such as rice, wheat, and maize have shown significant volatility in recent years due to global market dynamics, currency depreciation, and domestic supply challenges (Adeniran & Yusuf, 2021). Understanding the role of food imports in this context is critical for achieving price stability. The Nigerian government has introduced programs like the Agricultural Transformation Agenda and the Anchor Borrowers' Programme to increase local production (CBN, 2020). Nevertheless, the effectiveness of these initiatives in reducing import dependence and stabilizing prices remains uncertain. Import restrictions aimed at protecting local producers can sometimes lead to inflationary pressures when domestic supply is inadequate (Ajakaiye & Fakiyesi, 2019).

With commodity prices on the rise, food security is an urgent concern in Nigeria. The impact of food imports on local prices affects consumers' purchasing power and the broader economy. While considerable research exists on food security and agricultural economics in Nigeria, few studies have directly examined the relationship between food imports and commodity prices. This study addresses that gap by offering an empirical analysis to better inform policymakers and stakeholders. In conclusion, food imports are a key element of the global food system, shaped by complex economic, social, and environmental factors. Understanding their influence on domestic markets and food security is vital for developing effective agricultural policies, particularly in Nigeria where import reliance is significant. This study aims to provide insights that support more stable commodity prices and a resilient economic environment.

2.1.2. Concept of Commodity Prices

Commodity prices refer to the cost of raw materials and primary agricultural products such as oil, grains, metals, and food. These prices are highly sensitive to market forces and can fluctuate significantly due to supply and demand changes, geopolitical developments, and international trade policies. Often, commodity prices are among the first indicators to respond to inflationary pressures, as rising costs for inputs like fuel, labor, and raw materials increase production expenses (Ajayi & Olayemi, 2013). In Nigeria, key commodities including crude oil, food items, and agricultural inputs are strongly affected by both domestic inflation and external factors such as global price trends, exchange rate fluctuations, and government policies (CBN, 2019). As inflation rises, prices for essential goods like food and fuel typically increase, placing pressure on

household finances, business costs, and overall economic stability. Understanding the link between inflation and commodity prices is essential for grasping broader economic impacts, particularly in developing economies like Nigeria that depend heavily on imports and are vulnerable to global market volatility (Fowowe, 2017).

2.2. Theoretical Framework

A theoretical framework provides the foundation for understanding the key concepts and relationships that underpin a study. It helps to explain how variables interact and guides the research design and analysis. In this study, the impact of food imports on commodity prices in Nigeria is examined through the lens of three complementary economic theories: the Law of Supply and Demand, Cost-Push Inflation Theory, and Structuralist Theory. Together, these theories offer a comprehensive explanation of the mechanisms driving commodity price fluctuations in Nigeria. The **Law of Supply and Demand**, as articulated by Marshall (1890), states that prices are determined by the balance between supply and demand in the market. An increase in food imports expands the supply of food commodities, which typically exerts downward pressure on prices. Conversely, import restrictions or disruptions in global supply chains reduce available supply, causing domestic prices to rise. This theory is fundamental for analyzing how changes in import volumes directly influence commodity prices.

The **Cost-Push Inflation Theory**, discussed by Blanchard (2017), explains inflation as a result of rising production costs. In Nigeria's context, increases in global food prices or depreciation of the local currency raise the cost of food imports. These higher costs are passed on to consumers, pushing up food prices and intensifying inflationary pressures. This theory highlights the role of external cost factors in shaping domestic price levels. The **Structuralist Theory** of inflation, emphasized by Taylor (1983), attributes persistent inflation in developing economies to structural inefficiencies such as low agricultural productivity, inadequate infrastructure, and high import dependence. For Nigeria, insufficient domestic food production renders the country vulnerable to external shocks, causing instability in commodity prices and contributing to food insecurity. This theory complements the previous two by focusing on deeper, systemic issues that exacerbate price volatility. By integrating these theories, this framework captures both market dynamics and structural challenges that influence commodity prices in Nigeria. It provides a robust basis for investigating how food imports affect price stability and food security. This theoretical foundation aligns with the study's objective to analyze both short- and long-term impacts of food

imports on commodity prices, ultimately guiding the formulation of relevant policy recommendations.

2.3. *Review of Empirical Studies on Impact of Price Stability on Commodity Prices in Nigeria*

Several studies examine the influence of macroeconomic variables on food price inflation, employing time-series econometric techniques. Sharma, Meena, and Anwer (2024) analyzed monthly data from India (2011–2022) using the ARDL model to explore the pass-through between non-food and food inflation. They identified money supply, per capita income, agricultural wages, and food prices as positive drivers of food inflation in both short and long terms. Use of monthly data offers fine-grained insights; robust ARDL framework captures both short- and long-term dynamics. Focus limited to India; external shocks or trade variables not deeply explored. The Demonstrates important macroeconomic drivers applicable to import-dependent economies like Nigeria. Shehu, Bello, and Abdullatef (2023) applied the ARDL model to Nigerian annual data (1990–2021), revealing short-run impacts of oil prices on food inflation but no long-run effect, while money supply consistently influenced prices. *Strengths:* Long data span offers historical perspective; context-specific insights into oil-price-food-inflation nexus. While the study used annual frequency may miss short-term fluctuations; exchange rates impact ambiguous. Directly pertinent to Nigerian context, highlighting complex interactions among macro variables and food prices. These studies collectively affirm the significance of macroeconomic factors such as money supply and oil prices in shaping food inflation, underscoring the need to consider external price shocks and monetary dynamics in food import analyses.

However, a growing body of literature explores how food imports directly affect commodity prices, incorporating behavioral, climatic, and policy dimensions. Choi and Lee (2023) investigated behavioral economic responses to food import changes, finding a positive relationship between imports and commodity prices driven by consumer expectations.

Strengths: Novel behavioral focus enriches understanding of price formation beyond supply-demand. The study is limited to market participants' perceptions; causality remains unclear.

Relevance: Adds psychological dimension to import-price relationship, useful for demand-side policy design. Nguyen *et al.* (2023) focused on Vietnam and Thailand, using time-series analysis to show rice imports raise local prices during off-seasons,

recommending improved storage and distribution to reduce volatility. While the study employed region-specific, with policy recommendations addressing supply chain constraints. Thus, the study is limited to rice and two countries; broader applicability uncertain. Highlights seasonal import effects and infrastructure role, relevant to Nigeria's agricultural cycles. Chen *et al.* (2023) assessed climate change's role in intensifying reliance on food imports and resulting price fluctuations through simulation models, noting significant positive associations. The study incorporates environmental factors and future projections. Simulations depend on assumptions; empirical validation needed. Emphasizes climate risks that exacerbate import dependence, pertinent for sustainable policy.

Similarly, Bello and Olufemi (2023) employed difference-in-differences to analyze trade agreements in Africa, finding increased imports linked to commodity price spikes during global disruptions. Quasi-experimental design enhances causal inference; regional focus. Trade agreement heterogeneity may complicate generalization. Connects trade policies to import-price dynamics in African context. Martinez and Reyes (2023) surveyed consumer behavior in Latin America, demonstrating demand elasticity in response to import-driven price rises. Empirical consumer data with econometric rigor. Survey bias potential; regional focus limits transferability. The study illustrates consumer adaptation, vital for evaluating welfare impacts. Pérez *et al.* (2023) combined qualitative and quantitative methods to study COVID-19 supply chain disruptions, linking increased import costs to domestic price hikes. Mixed-method approach captures complex dynamics. Pandemic-specific context; may not reflect normal conditions. Shows vulnerability of import-reliant economies to global shocks. These studies underscore that food imports influence commodity prices not only through supply changes but also via behavioral, climatic, and policy-related channels, suggesting multidimensional impacts requiring integrated policy responses.

Research highlights the role of global price volatility, exchange rate movements, and policy interventions. Zhang *et al.* (2023) used a structural VAR model to show how global food price shocks transmit to domestic markets in emerging economies, significantly raising staple food prices. The study applied advanced econometrics capturing transmission mechanisms. Emerging economy focus may limit applicability to advanced economies. Vital for understanding international price pass-through in Nigeria. Adetunji *et al.* (2023) applied dynamic panel data to Nigerian import policies, finding restrictive policies cause short-term price spikes and shortages, recommending balanced approaches. Policy-relevant, panel approach improves robustness. Short-

term focus; long-term impacts less clear. Directly informs Nigerian policy on import regulation. Kumar and Singh (2022) analyzed India's exchange rates and food imports using cointegration and error correction models, highlighting depreciation-induced price rises. Strong econometric evidence of currency effects. India-specific; different trade structures elsewhere. Reinforces importance of stable currency policy in managing import costs.

Akinbode *et al.* (2022) and Kashif *et al.* (2022) explored oil prices' asymmetric effects on food inflation in Nigeria and Pakistan, respectively, revealing significant positive impacts predominantly for oil price increases. Focus on asymmetry improves understanding of price dynamics. Mixed evidence on short-run effects. Oil prices critical for energy-intensive food production and import costs. Smith and Johnson (2023) studied tariffs across countries, finding higher tariffs reduce price volatility but may harm consumer welfare, especially for lower-income groups. While the study used cross-country comparative analysis. Yet, welfare effects need further exploration. Highlights trade-offs in protective trade policy design. These findings emphasize the complex interplay between external shocks, exchange rates, and policy instruments in shaping food import impacts on commodity prices, stressing the need for nuanced strategies.

Nevertheless, Emerging literature considers how technology, environment, and structural factors mediate import-price relationships. In their study Li and Wang (2023) and Nguyen and Tran (2023) highlight technological innovations in agriculture and supply chains as key to mitigating price volatility from imports, using panel data and case studies. While the study used empirical support for tech-driven stability. Thus, technological adoption varies widely. Suggests technology as a strategic tool for Nigeria's food system resilience. Elhassan *et al.* (2022) examined environmental impacts of imports, linking increased carbon footprints to rising production costs and commodity prices, advocating sustainable practices. Integrates sustainability concerns with economic analysis. Causal pathways need empirical validation. Important for long-term policy balancing economic and environmental goals. Ogunbiyi *et al.* (2022) found enhanced local agricultural productivity reduces import dependence and stabilizes prices in West Africa using ARDL models. while the study applied contextualized regional analysis. Thud, aata constraints may limit external validity. Supports local production as a key policy lever for Nigeria. Akinwumi and Ojo (2023) revealed that sustained import reliance stifles local agricultural development, perpetuating food insecurity through a cyclical effect. Longitudinal approach captures dynamic impacts, yet, causality complex

to disentangle. Highlights structural challenges Nigeria faces. These studies suggest that beyond trade and macroeconomics, structural and technological factors critically influence how imports affect commodity prices and food security.

The literature converges on the importance of food imports in shaping commodity prices but reveals inconsistencies regarding the magnitude and duration of effects across contexts. While many studies highlight positive relationships between imports and prices, others find mitigating factors such as subsidies, technology, or trade policies. Most focus on short- to medium-term effects; long-term impacts and structural adjustments are less understood. Methodological diversity (ARDL, VAR, panel data, behavioral surveys) enriches insights but complicates direct comparisons. Notably, few studies comprehensively integrate environmental, behavioral, and policy factors in a unified framework.

This review underscores the complexity of the food import–commodity price nexus in Nigeria, marked by macroeconomic volatility, trade policy challenges, structural constraints, and environmental risks. It justifies the current study's comprehensive analytical framework that incorporates multiple theories and empirical methods to address these intertwined factors. By filling gaps on long-term effects and integrating behavioral and structural perspectives, the study aims to inform more effective and sustainable food security and price stabilization policies.

3. Methodology

3.1. Data and Source

This study employed a secondary dataset spanning from 2000 to 2024, a period marked by several major global events influencing food imports and commodity prices. Notably, the 2008 financial crisis triggered widespread economic instability and heightened volatility in commodity markets. More recently, the COVID-19 pandemic severely disrupted global supply chains, shifted demand patterns, and intensified inflationary pressures. Additionally, episodes of insurgency have adversely affected commodity supply by disrupting agricultural production and distribution networks. Data for the dependent variable commodity prices and independent variables including food imports, inflation rate, crude oil prices, economic growth, interest rates, money supply, and insecurity were sourced from the World Bank Indicators (WBI, 2024). Commodity prices, the study's dependent variable, capture fluctuations in the market value of essential goods, particularly natural resources, which are prone to significant short-

term volatility and are vital for evaluating the economic feasibility of resource-related projects. Food imports were measured using both the quantity and value of food products imported into the country, consistent with the methodology of the World Development Indicators (2023) published by the World Bank.

3.2. Model Specifications

This study on the assessment of the impact of food import on commodity prices adapts econometric model with modification which is in line with the work of ogunbiyi *et al.* (2022). The functional model is specified as:

$$CMP = f(FIM, INFR, CRP, INR, MS, INS) \quad (3.1)$$

Where: *"CMP"* is commodity price, "*FDIM*" signify food import, "*INFR*" denotes inflation rate, "*CRP*" represents crude oil price, "*INR*" denote interest rates, "*MS*" symbolizes money supply, "*INS*" denotes insurgence. The above functional model can be restated into mathematic model or equation as follow:

$$CMP_t = \beta_0 ++ \beta_1 FIM_t + \beta_2 PRS_t + \beta_3 CRP_t + \beta_4 INR_t + \beta_5 MS_t + \beta_6 INS_t \quad (3.2)$$

Where: "*t*" is the time series variance, "β_0" represent the constant parameters, and "β_1–β_6" are the parameters to be estimated. Thus, the mathematical equation can be restated into econometric model to captured the error term. The econometric model or equation is specified as:

$$CMP_t = \beta_0 ++ \beta_1 FIM_t + \beta_2 INFR_t + \beta_3 CRP_t + \beta_4 INR_t + \beta_5 MS_t + \beta_6 INS_t + \mu_t \quad (3.3)$$

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:

$$lCMP_t = \beta_0 + \beta_1 lFIM_t + \beta_2 lINFR_t + \beta_3 lCRP_t + \beta_4 lINR_t + \beta_5 lMS_t + \beta_6 lINS_t + \mu_t \quad (3.4)$$

Where: $lCMP_t$ is logarithms of commodity price, "*lFIM*" signify logarithms of food import, "*lIFR*" denotes logarithms of inflation rate, "*lCRP*" represents logarithms of crude oil price, "*lINR*" denote logarithms of interest rates, "*lMS*" symbolizes logarithms of money supply, "*INS*" denotes logarithms of insecurity.

3.3. Methods of Data Analysis

This study applied both descriptive and inferential statistical techniques for data analysis. Descriptive statistics are used to summarize the characteristics of each variable, aiding in data interpretation and comparison. These include measures of central tendency (mean, median, and mode), as well as the maximum and minimum values. Additionally, the distributional properties of the data are assessed using skewness and kurtosis to identify trends, patterns, and potential outliers (Jaggi, 2012). For inferential analysis,

the study employs multiple regression techniques, appropriate when the dependent variable is continuous and the independent variables are of various types (Gujarati, 2004). The inferential analysis is divided into three stages: pre-estimation testing, model estimation, and post-estimation diagnostics.

The pre-estimation phase involves testing for multicollinearity and stationarity. Multicollinearity is assessed to determine whether independent variables are excessively correlated, as this can distort the accuracy of regression estimates. Correlation analysis is used to measure the strength and direction of relationships between variables, with correlation coefficients ranging from -1 to +1. Values close to ±1 indicate strong relationships, while those near zero suggest weak or no correlation. Statistical significance is typically evaluated at the 0.01 or 0.05 level, with p-values above 0.05 indicating insignificant relationships (Zakari, 2017). High multicollinearity inflates standard errors and hampers the identification of the individual effects of each independent variable (Gujarati, 1995). Because time series data are commonly non-stationary—where statistical properties like the mean and variance change over time—unit root tests are necessary. Non-stationary variables can produce misleading regression results, known as spurious regression. To address this, the study applies unit root tests such as the Dickey-Fuller (DF), Augmented Dickey-Fuller (ADF), and Phillips-Perron (PP) tests to determine whether variables require differencing to achieve stationarity (Gujarati, 2004; Phillips, 1988). Ensuring stationarity is essential for producing reliable regression estimates (Granger, 1988). The ADF test equation, incorporating constant terms and trends, is formulated as follows:

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

Where: ΔY_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 Phillips-Perron (PP) test, introduced by Phillips and Perron (1988), modifies the t-statistic to account for serial correlation and heteroskedasticity in time series data. Unlike the Augmented Dickey-Fuller (ADF) test, which can be biased in the presence of structural breaks, the PP test adopts a non-parametric approach that remains robust even when structural changes occur at unknown points in time. This makes it particularly useful for analyzing real-world economic data, where such shifts are common. As noted by Hamilton (1994), the PP test is often regarded as more reliable than the ADF test, especially in datasets with autocorrelation and non-constant variance.

$$\Delta CMP_t = \partial_t + \beta_t + (\rho - 1)\gamma_{t-1} + \varepsilon_t \quad (3.6)$$

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 Autoregressive Distributed Lag (ARDL) model, originally introduced by Pesaran *et al.* (2001), offers several methodological advantages, making it well-suited for this study. One key strength of the ARDL approach is its flexibility—it does not require all variables in the model to be integrated of the same order. It can be applied whether the variables are stationary at level [I(0)], first difference [I(1)], or a combination of both. Additionally, the ARDL model yields reliable and robust results regardless of whether the sample size is small or large. Another significant benefit is that it incorporates the Error Correction Model (ECM), which captures both the short-run dynamics and long-run equilibrium relationships among variables.

$$\begin{aligned}\Delta lCMP_{t-1} = {} & \beta_0 + \sum_{i-1}^{m} \beta_1\, lCMP_{t-1} + \sum_{i-1}^{m} \beta_2\, lFDIM_{t-1} + \sum_{i-1}^{m} \beta_3\, lINFR_{t-1} + \sum_{i-1}^{m} \beta_4\, lCRP_{t-1} + \sum_{i-1}^{M} \beta_5\, lINR_{t-1} \\ & + \sum_{i-1}^{m} \beta_6\, LMS_{t-1} + \sum_{i-1}^{M} \beta_7\, lINS_{t-1} + \beta_1 \Delta lCMP_{t-1} + \beta_2 \Delta lFIM_{t-1} + \beta_3 \Delta lINFR_{t-1} \\ & + \beta_4 \Delta lCRP_{t-1} + \beta_5 \Delta lINR_{t-1} + \beta_6 \Delta lMS_{t-1} + \beta_7 \Delta lINS_{t-1} + \mu_t\end{aligned} \quad (3.7)$$

From the above ARDL model, *LCMP, LFDIM, LINFR, LCRP, LINR, LMS,* and *LINS* stands for the lag length of the long run, the short run effect of the impact of price stability on commodity price in Nigeria are detected by the sign and significance of Δs, also the sign and significance of β_1 normalized on β_7 showing the long run effects. The most important econometric tools for examining the nature of ARDL long-run relationship that exists among time series variables are the co-integration bound test. The term co-integration test refers to a relationship that exists between a non-stationary series in the unit root processes. The existence of a co-integrating relationship between two variables has the following economic intuition. Firstly, if two series are co-integrated even though both processes are non-stationary it means that there is a long-run equilibrium relationship linking both series so that the relationship is stationary (Gujarati, 2004). Secondly, a set of variables are co-integrated if the series is 1 (1). The ARDL cointegration bound test is specified as:

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

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, β_1–β_2 represent the coefficient of the parameters to be estimated, while μ_t denotes the error term. The error correction model measure long run relationships that exist among time series variables. The error correction model can be specified as follows:

$$\Delta lCMP_{t-1} = \beta_0 + \sum_{i-1}^{m} \beta_1 lCMP_{t-1} + \sum_{i-1}^{m} \beta_2 lFDIM_{t-1} + \sum_{i-1}^{m} \beta_3 lINFR_{t-1} + \sum_{i-1}^{m} \beta_4 lCRP_{t-1} + \sum_{i-1}^{M} \beta_5 lINR_{t-1} + \sum_{i-1}^{m} \beta_6 LMS_{t-1} + \sum_{i-1}^{M} \beta_7 lINS_{t-1} + ECM + \mu_t \quad (3.9)$$

Where: Δ represents the difference or changes capturing short-run impact, ε capture the long-run impact ECM (-1) is the Error Correction Term, μ_t represent the error term. From the above equation the short run impact is addressed via the individual coefficients of the different terms, also the ECM coefficient of the specification contains information about whether the past values of variables affect the current values.

4. Results and Discussions

Table 4.1: Results of the Descriptive Analysis

Varbs.	Mean	Media	Max	Min	Std.Dev.	Skew.	Kurt.	Obs.
CMP	1.3640	1.6693	2.4408	-0.1419	0.8370	-0.5711	1.8572	44
FDIM	10.230	10.178	10.780	9.5923	0.3860	0.0114	1.5717	44
INFR	18.872	12.941	72.835	5.3888	16.149	1.9032	5.6196	44
CRP	0.9868	1.1997.	2.5006	-0.9763	1.1665	-0.4650	1.8428	44
INR	17.048	16.898	31.650	8.4316	4.9129	0.3458	3.4887	44
MS	1.2500	1.2746	1.9433	0.1423	0.3666	-0.9032	4.2701	44
INS	0.9430	0.9283	1.4248	0.3830	0.2877	-0.1719	1.7004	44

Source: Author's Computation EViews 12

Table 4.1 presents the descriptive statistics for food imports and commodity prices in Nigeria, highlighting key measures such as the mean, maximum and minimum values, standard deviation, skewness, and kurtosis. The average inflation rate stands at 1.3, while the average commodity price is 18.8. The higher average inflation rate reflects broader macroeconomic trends, whereas the relatively stable average for commodity prices suggests they are driven by more sector-specific factors. Inflation ranges from

-0.1 to a peak of 72.8, indicating episodes of hyperinflation likely tied to economic crises or political unrest. In contrast, commodity prices range narrowly between 2.4 and 5.3, suggesting more consistent behavior, possibly due to more predictable supply and demand dynamics. The inflation rate exhibits a high standard deviation of 16.1, indicating substantial volatility. This variability is likely driven by macroeconomic instability, policy fluctuations, and external shocks. Commodity prices, on the other hand, have a lower standard deviation of 0.8, implying greater stability over time.

Inflation is positively skewed (1.9), indicating a distribution with a long right tail, suggesting that extreme inflationary episodes occur more frequently. Commodity prices show negative skewness (-0.5), reflecting a tendency for occasional price drops, likely due to market oversupply or demand shocks. The kurtosis value for inflation is 5.6, indicating a leptokurtic distribution characterized by fat tails and a higher likelihood of extreme values highlighting Nigeria's vulnerability to inflationary shocks. Conversely, commodity prices show a kurtosis of 1.8, suggesting a platykurtic distribution with lighter tails and fewer extreme fluctuations. **Overall Insight:** These descriptive statistics reveal that while commodity prices in Nigeria tend to remain relatively stable, inflation exhibits considerable volatility, often driven by macroeconomic conditions, policy uncertainty, and geopolitical factors. This contrast underscores the importance of monitoring inflationary pressures when evaluating commodity price behavior.

4.2.1. Pre-test Estimation

Table 4.2: Results of Multicollinearity Test (Correlation Analysis)

Varbls.	*LCMP*	*LFIM*	*LINFR*	*LCRP*	*INR*	*LMS*	*LINS*
LCMP	1	0.0152	0.3919	0.2444	0.1581	0.2535	-0.2018
LFIM	0.0152	1	0.1097	0.3331	-0.2370	0.4156	-0.0431
LINFR	0.3919	0.1097	1	0.3846	0.0134	0.0472	-0.0053
LCRP	0.2444	0.3331	0.3846	1	0.3048	0.2266	0.3829
LINR	0.1581	-0.2370	0.0134	0.3048	1	0.0304	-0.0349
LMS	0.2535	0.4156	0.0472	0.2266	0.0304	1	0.0773
LINS	-0.2018	-0.0431	-0.0053	-0.3829	-0.0349	0.0773	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. Therefore, the null hypothesis of no multicollinearity among the variables is accepted and reject the.

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	-1.761	0.394	-1.767	0.960	-3.804	0.005***	-4.032	0.015**
LFIM	-0.865	0.789	-2.515	0.319	-6.609	0.000***	-6.720	0.000***
LINF	-2.026	0.040**	-3.081	0.123	-12.19	0.000***	-5.269	0.000***
LCRP	-1.204	0.663	-1.452	0.830	-7.131	0.000***	-8.421	0.000***
INR	-2.403	0.014	-2.205	0.477	-7.142	0.000***	-7.358	0.000***
LMS	-5.269	0.000***	-5.178	0.000***	-22.60	0.000***	-25.79	0.000***
LINS	-1.530	0.508	-1.869	0.652	-7.206	0.000***	-7.158	0.000***
Significant at 1%(***), 5%(***), 10(*), Source: Eviews 10								

Source: Author's Computation, Eviews 12

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	-1.761	0.394	-0.767	0.960	-3.804	0.005***	-4.032	0.015**
LFIM	-0.865	0.789	-2.515	0.319	-6.609	0.000***	-6.720	0.000***
LINF	-3.026	0.040**	-3.081	0.123	-12.19	0.000***	-12.805	0.000***
LCRP	-1.204	0.663	-1.452	0.830	-7.131	0.000***	-8.421	0.000***
INR	-2.403	0.146	-2.2005	0.477*	-7.142	0.000***	-7.358	0.000***
LMS	-5.269	0.000***	-5.178	0.000***	-22.60	0.000***	-25.09	0.000***
LINS	-1.530	0.508	-1.869	0.652	-7.206	0.000***	-7.158	0.000***
Significant at 1%(***), 5%(***), 10(*), Source: Eviews 10								

Source: Author's Computation, Eviews 12

Table 4.3 and 4.4 revealed the results of the Augmented Dickey-Fuller and Philips Perron unit root test. The result shows that variables such as commodity prices, food import, inflation, crude oil price, interest rates, money supply, and insecurity 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. Thus, the null hypothesis that the variables are not stationary is

rejected and accept the alternative hypothesis that the variables capture in the model are stationary.

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 I(1)*	*Lower Bound I(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 food import 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. Thus, the null hypothesis of there is no cointegration among the parameters employed in this study is rejected and accept the alternative hypothesis of there is cointegration between inflation rate and commodity prices Nigeria. 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: CMP				
Ind. Variables	Coefficient	Std. Error	t-Statistic	P-value
LFDIM	-0.4020	0.1455	-2.7613	0.0221**
LINFR	0.0025	0.0010	2.3098	0.0462
LCRP	0.6394	0.1899	3.3670	0.0083***
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
ΔLFDIMP	-0.4020	0.1455	-2.7613	0.0221**
ΔINFR	-0.0025	0.0010	-2.3098	0.0462
ΔLCRP	-0.7166	0.2355	-3.0418	0.0140**
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 presents the results of the ARDL model estimating both long-run and short-run relationships between food imports and commodity prices in Nigeria. Food imports and money supply exhibit a positive and significant long-run relationship with commodity prices. An increase in food imports contributes to higher commodity prices, likely due to higher import costs being passed on to consumers. Similarly, increased money supply stimulates demand, thereby driving up prices. These findings are consistent with those of Shehu *et al.* (2023) and Hemmati *et al.* (2018). Inflation also shows a positive long-run effect on commodity prices. Although a 1% increase in inflation corresponds to a relatively small 0.0% rise in commodity prices, the direction suggests that inflationary pressures such as demand-pull dynamics or commodities being used as a hedge support gradual price increase. This aligns with Sharma *et al.* (2024), Akinbode *et al.* (2022), Shehu *et al.* (2023), and Hemmati *et al.* (2018), but contradicts the findings of Ertuğrul and Seven (2021).

Crude oil prices also positively affect commodity prices in the long run. Rising oil prices can boost government revenue and spending, which may fuel inflation and drive-up commodity prices a result consistent with Akinbode *et al.* (2022). Interest rates, however, have a negative long-run effect on commodity prices. Higher interest rates raise borrowing costs and dampen consumer and producer spending, thereby reducing

demand for commodities. This finding corroborates with Akinbode *et al.* (2022). In terms of insecurity, the long-run relationship with commodity prices is statistically insignificant, implying that the Nigerian commodity market has developed a degree of resilience against prolonged security challenges. This finding is in line with Oderinde *et al.* (2022).

In the short run, the relationship between inflation and commodity prices is negative, albeit with a small magnitude. A 1% increase in inflation is associated with a 0.0% decrease in commodity prices, suggesting that short-term price behavior is more sensitive to immediate supply-demand dynamics, cost-push shocks, and geopolitical uncertainties. This observation supports the work of Shehu *et al.* (2023), Kashif *et al.* (2022), and Shehu *et al.* (2019), though it diverges from Akinbode *et al.* (2022), who found a positive short-term relationship. Crude oil prices in the short run exert a negative effect on commodity prices. This may reflect increased production and transportation costs, which dampen demand. The result aligns with Ertuğrul and Seven (2021). Interest rates show a non-significant short-run effect on commodity prices, suggesting that monetary policy shifts do not immediately influence commodity prices. Instead, short-term fluctuations are likely driven by seasonal, market, or external factors. Insecurity, while not significant in the long run, shows a positive short-run relationship with commodity prices. This reflects supply chain disruptions and reduced agricultural output during conflict periods, consistent with Oderinde *et al.* (2022).

The ARDL estimation reveals a nuanced relationship between food imports and commodity prices in Nigeria. In the long run, key drivers such as food imports, inflation, money supply, and crude oil prices contribute positively to rising commodity prices. Interest rates exert a dampening effect, while insecurity shows no significant long-term impact. In the short term, commodity price behavior is shaped more by immediate shocks and market volatility, with inflation and oil prices having negative or insignificant effects. Overall, the Nigerian market exhibits both vulnerability and resilience in the face of macroeconomic and geopolitical challenges.

4.2.3. Post-test Estimation

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 presents the results of the diagnostic tests conducted to verify the validity of the regression model. These tests include checks for heteroskedasticity, the Breusch-Godfrey Serial Correlation LM test, and the normality of residuals. The primary objective of these diagnostics is to assess whether the model meets the key assumptions of classical linear regression. The findings indicate no evidence of heteroskedasticity or serial correlation, as all associated p-values were statistically insignificant. Consequently, we fail to reject the null hypothesis for both tests confirming the absence of autocorrelation and supporting the model's reliability. These results validate the regression estimates and reinforce confidence in the model's specification.

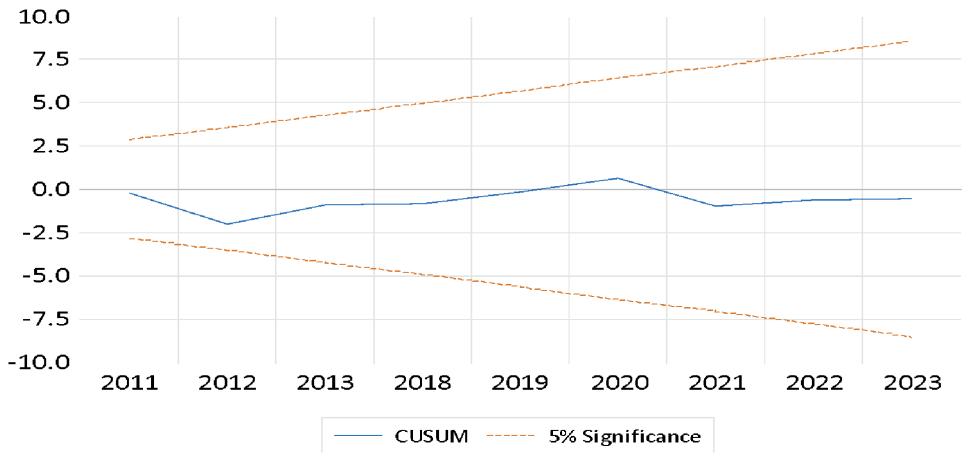

Figure 4.1: QUSUM Test

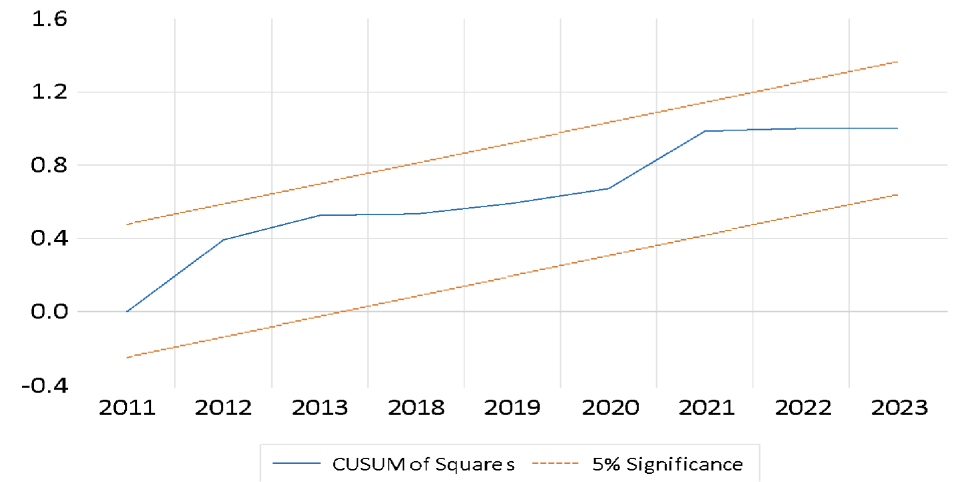

Figure 4.2: CUSUM-Q Test

Figures 4.1 and 4.2 present the results of the model stability test using the CUSUM and CUSUM of squares procedures. Both tests indicate that the estimated parameters remain stable throughout the study period. This conclusion is drawn from the fact that the cumulative sums of recursive residuals fall within the 5% significance boundaries (the critical lines) for both tests. As a result, we accept the null hypothesis of no structural break and reject the alternative hypothesis suggesting the presence of instability. This confirms that the model's parameters are structurally stable over time.

5. Conclusion and Policy Recommendation

The analysis of the long-run and short-run ARDL estimation on the impact of food imports on commodity prices in Nigeria reveals a complex interplay of economic factors. In the long run, food imports and money supply positively influence commodity prices, reflecting increased consumer and business demand. Additionally, inflation exhibits a positive long-run relationship with commodity prices, indicating that as price stability rises, commodity prices tend to increase. However, in the short run, the relationship is more nuanced; inflation appears to exert a negative effect on commodity prices, suggesting that immediate supply and demand dynamics, geopolitical events, and cost-push factors dominate over inflationary pressures.

Crude oil prices significantly impact commodity prices, positively in the long run but negatively in the short run, highlighting the dual nature of this relationship. Interest rates have a long-run negative effect on commodity prices due to increased borrowing costs that suppress demand. Insecurity, while non-significant in the long run, presents short-run challenges through supply disruptions. Overall, the findings emphasize the importance of both long-term trends and short-term fluctuations in understanding commodity price dynamics in Nigeria. The paper recommends among other thing the need for government through the Central Bank of Nigeria to consider adjusting interest rates and money supply carefully to manage inflation while supporting economic growth. Policies that stabilize the money supply can help mitigate inflation's adverse effects on commodity prices. To ensure food security and stabilize commodity prices, the government should implement policies that promote local agricultural production. This includes providing subsidies, improving infrastructure, and facilitating access to technology for farmers. By implementing these policy recommendations, Nigeria can better navigate the complexities of commodity price dynamics, fostering a more stable economic environment that supports sustainable growth and food security.

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