Int. j. adv. multidisc. res. stud. 2026; 6(2):1529-1535

Received: 27-02-2026
Accepted: 07-04-2026

International Journal of Advanced Multidisciplinary Research and Studies

ISSN: 2583-049X

Domestic Food Price Volatility and Supply Response of Staple Foods (Maize, Rice and Wheat) in Nigeria

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Abstract
This study examined the effects of domestic food price volatility on the supply response of staple foods such as maize, rice, and wheat in Nigeria using monthly time-series data spanning 1981–2023. Data were sourced from the National Bureau of Statistics, the Food and Agriculture Organization, the World Bank, and the Central Bank of Nigeria. Augmented Dickey–Fuller and Phillips–Perron tests showed that all variables were integrated of order one, I(1). Johansen cointegration results indicated the existence of three long-run cointegrating relationships among the variables. Regression results revealed that global food price shocks exerted a positive and significant effect on staple food supply ($\beta = 0.296$, $p < 0.01$), while domestic food prices also significantly increased supply response ($\beta = 0.157$, $p < 0.01$), with an adjusted R^2 of 0.698. Furthermore, global demand positively influenced global food price shocks ($\beta = 0.428$, $p < 0.01$), whereas global supply had a dampening effect ($\beta = -0.267$, $p < 0.01$), and exchange rate depreciation intensified price shocks ($\beta = 0.192$, $p < 0.01$). The study recommended strengthening domestic production capacity to reduce vulnerability to global price shocks.

Keywords: Global Food Price Shocks, Staple Food Supply, Supply Response, Price Transmission, Exchange Rate

Introduction

Global food markets have become increasingly volatile over the past two decades, with recurrent price shocks driven by climate change, pandemics, geopolitical conflicts, energy price fluctuations, exchange rate instability, and policy uncertainty (Xue *et al.,* 2024; Long, Li, & Luo, 2023) [23, 10]. Staple foods such as maize, rice, and wheat are particularly vulnerable to these global disturbances because they are widely traded commodities and form the core of food consumption baskets in developing countries, including Nigeria (Odojoma *et al.,* 2025; Ugomma & Ekechukwu, 2024) [17, 22]. As a net importer of rice and wheat and a major producer and consumer of maize, Nigeria is highly exposed to international price movements, making global food price shocks a critical concern for domestic food security, inflation, and welfare outcomes (Tolulope, 2022; Bello & Bappayaya, 2023) [21, 5].

Empirical evidence shows that global and domestic food prices are closely linked through trade, exchange rates, and market expectations. Studies on price transmission and volatility have demonstrated that shocks originating from global markets often spill over into domestic food systems, affecting both producers and consumers. For instance, Tolulope (2022) [21] identified exchange rate movements, inflation, and global market dynamics as major drivers of food price volatility in Nigeria. Similarly, Bello and Bappayaya (2023) [5] showed that external oil price shocks significantly influenced staple food prices, indirectly raising production and marketing costs. Beyond Nigeria, Xue *et al.* (2024) [23] and Long *et al.* (2023) [10] documented strong spillover effects and asymmetric responses in global grain prices, underscoring the interconnectedness of maize, rice, and wheat markets.

While the effects of food price shocks on consumption, nutrition, and welfare have been widely studied, the supply-side response remains less clearly understood, particularly in the Nigerian context. Existing empirical studies suggest that producers' responses to price shocks are often weak or delayed due to structural constraints. For example, Adekunle, Kao, and Sergeo (2023) [3] found that although cereal output supply in Nigeria responds positively to own-price changes, the magnitude of response varies and is constrained by input costs and institutional factors. Similar findings from Abeysekara and Prasada (2022) [1] and Cancino *et al.* (2022) [6] indicate that agricultural supply responses in developing economies are generally inelastic in the short run, implying limited capacity of farmers to adjust output quickly in response to price signals. These constraints are particularly relevant for staple food producers in Nigeria, who face challenges such as high input prices, limited access to credit, insecurity, poor infrastructure, and climate-related risks.

Moreover, recent studies highlight that global food price shocks have broader macroeconomic and welfare implications in Nigeria. Odojoma *et al.* (2025) [17] and Nathaniel (2023) [14] emphasized that exchange rate depreciation, inflationary pressures, and policy inconsistencies amplify food price shocks in import-dependent economies like Nigeria. Adekunle *et al.* (2024) [2] further showed that conflict-induced price shocks for wheat and rice significantly reduced calorie intake and dietary diversity, suggesting that supply inadequacies exacerbate the adverse effects of rising prices. These findings point to a critical gap: while global food price shocks are well documented, there is limited empirical understanding of how Nigeria's staple food supply responds to such shocks and which factors condition this response.

Against this background, the problem confronting Nigeria is twofold. First, global price shocks of staple foods continue to transmit strongly into the domestic market, contributing to persistent food inflation and food insecurity. Second, the domestic supply response of maize, rice, and wheat appears insufficient to cushion the effects of these shocks, raising concerns about the effectiveness of price signals in stimulating production. Despite the growing body of literature on food price volatility and welfare impacts, empirical evidence on the magnitude of global staple food price shocks in Nigeria, the determinants of supply response to these shocks, and the underlying factors driving global food price shocks remains sparse and fragmented.

This study therefore seeks to fill this gap by addressing the following specific objectives:

1. Estimate the global price shocks of staple foods (maize, rice and wheat) in Nigeria;
2. Identify the factors that influence the supply response of staple food to global food price shocks in Nigeria; and
3. Evaluate the factors that influence global food price shocks.

Methodology

Study Area

The study was conducted in Nigeria, a West African country located between latitudes 4°16′N and 13°52′N and longitudes 2°40′E and 14°40′E. Nigeria shares international borders with Benin to the west, Niger to the north, Chad to the northeast, and Cameroon to the east, and has a coastline of approximately 853 km along the Gulf of Guinea. The country occupies a total land area of about 923,768 km², consisting of diverse agro-ecological zones ranging from the humid rainforest in the south to the semi-arid Sahel in the north. Nigeria's climatic conditions vary spatially, with tropical rainforest conditions in the southern region, Guinea savanna in the Middle Belt, and Sudan–Sahel savanna in the northern region. The Niger and Benue rivers traverse the country and converge in the central region, providing important irrigation potential for agricultural production. Agriculture remains a dominant sector of the Nigerian economy, contributing about one-quarter of gross domestic product and employing over 60% of the labour force. Given Nigeria's role as a major producer and consumer of maize and rice and its dependence on wheat imports, the country provides a suitable context for examining supply responses of staple foods to global food price shocks.

Population of the Study

The population of the study comprised producers of staple foods—maize, rice, and wheat—across Nigeria's major agricultural zones. This included smallholder farmers, commercial producers, and agribusiness enterprises involved in staple food production. In addition, relevant stakeholders such as agricultural extension officers, policymakers, and representatives of farmers' cooperatives and regulatory agencies were considered to provide contextual insights. The study accounted for heterogeneity in farm size, production systems (rain-fed and irrigated), and geographical distribution to ensure broad representation of supply behaviour across regions.

Sources and Method of Data Collection

The study relied exclusively on secondary data. Monthly time-series data covering the period 1981–2023 were obtained on staple food production, domestic prices, and global food price indices. Data sources included the National Bureau of Statistics, the Food and Agriculture Organization, the World Bank, and the Central Bank of Nigeria. Macroeconomic variables such as exchange rates, inflation, interest rates, and policy indicators were extracted from publications of the Central Bank of Nigeria and international databases. In addition, relevant policy documents were reviewed to capture government interventions affecting agricultural markets and staple food supply dynamics.

Measurement of Variables

The variables employed in the study, their measurements, and a priori expectations are presented in Table 3.1.

Table 3.1: Measurement of Variables

Variable	Description	Type	Measurement	A priori Expectation
Qt	Staple food supply	Dependent	Monthly production of maize, rice, and wheat (tonnes)	–
GFPSt	Global food price shocks	Independent	FAO Food Price Index (USD/tonne)	±
PDt	Domestic food prices	Independent	Average retail price of staple foods (₦/tonne)	+
Dt	Global demand	Independent	Global food consumption (tonnes)	+
EXCt	Exchange rate	Independent	₦ per USD	+

Method of Data Analysis

The study employed modern time-series econometric techniques. Stationarity properties of the variables were examined using the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests. Optimal lag lengths were determined using the Akaike Information Criterion (AIC), Schwarz Bayesian Criterion (SBC), and Hannan–Quinn Criterion (HQC). Depending on the results of the cointegration tests, either an Autoregressive Distributed Lag (ARDL) framework with an associated Error Correction Model (ECM) or a Vector Autoregression (VAR) approach was applied to capture short-run and long-run dynamics.

Model Specification and Formular

For each specific objective, the following models were specified after performing preliminary tests such as unit root tests, lag length selection, and cointegration analysis.

(a) Unit Root Test Model (ADF Test)

$$\Delta Y_t = \alpha_0 + \beta t + \gamma Y_{t-1} + \sum_{i=1}^{p} \delta_i \Delta Y_{t-i} + \varepsilon_t \quad (1)$$

Where:

Y_t= Time series variable under investigation (staple food supply, global food price shock, domestic price, global demand, or exchange rate).
Δ = First difference operator.
α_0= Constant (intercept) term.
t = Deterministic time trend.
β = Coefficient of the time trend.
γ= Coefficient of the lagged level of the variable (unit root parameter).
p = Optimal lag length selected using information criteria.
δ_i = Coefficients of lagged first differences.
ε_t = White-noise error term.

(b) Lag Length Selection Criteria
Akaike Information Criterion (AIC)

$$AIC = -2\ln L + 2k \quad (2)$$

Schwarz Bayesian Criterion (BIC)

$$BIC = -2\ln L + k\ln T \quad (3)$$

Hannan–Quinn Criterion (HQC)

$$HQC = -2\ln L + k\ln(\ln T) \quad (4)$$

Where:

L = Value of the log-likelihood function.
k = Number of estimated parameters in the model.
T = Sample size.

(c) Johansen Cointegration Model

$$\Delta Y_t = \Pi Y_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-i} + \varepsilon_t \quad (5)$$

Where:

Y_t = Vector of endogenous variables (staple food supply, global food price shocks, domestic prices, global demand, and exchange rate).
ΔY_t = First-differenced vector of variables.
Π = Long-run cointegration matrix containing information on long-run relationships.
Γ_i = Short-run adjustment coefficient matrices.
k = Optimal lag length.
ε_t = Vector of stochastic error terms.

(d) Vector Error Correction Model (VECM)

$$\Delta Q_t = \alpha + \sum_{i=1}^{p} \beta_i \Delta Q_{t-i} + \sum_{j=0}^{p} \gamma_j \Delta P_{t-j} + \theta ECT_{t-1} + \varepsilon_t \quad (6)$$

Where:

ΔQ_t = Change in domestic staple food supply at time *t* (metric tonnes).
α = Intercept term.
β_i = Short-run coefficients of lagged changes in staple food supply.
ΔP_{t-j}= Change in global food price shocks at lag *j*.
γ_j= Short-run response coefficients to global food price shocks.
ECT_{t-1} = Error correction term derived from the long-run cointegrating relationship.
θ = Speed of adjustment coefficient, expected to be negative and statistically significant.
ε_t= Error term.

(e) Vector Autoregression (VAR) Model

$$Q_t = \alpha + \sum_{i=1}^{p} \beta_i Q_{t-i} + \sum_{j=0}^{p} \gamma_j P_{t-j} + \sum_{k=0}^{p} \delta_k X_{t-k} + \varepsilon_t \quad (7)$$

Where:

Q_t = Domestic staple food supply at time *t* (metric tonnes).
Q_{t-i} = Lagged values of domestic staple food supply.
P_{t-j} = Lagged values of global food price shocks.
X_{t-k} = Vector of control variables (exchange rate, inflation, policy indicators).
$\beta_i, \gamma_j, \delta_k$ = Estimated parameters.
ε_t = Innovation term.

(f) Global Food Price Shock Index Model

$$GFPS_t = \sum_{i=1}^{n} w_i P_{i,t} \quad (8)$$

Where:

$GFPS_t$ = Global food price shock index at time *t*.
w_i = Weight of commodity *i* (maize, rice, wheat) in the index.
$P_{i,t}$ = International price of commodity *i* at time *t*.
n = Number of commodities included.

(g) Supply Response Model

$$Q_{it} = \beta_0 + \beta_1 GFPS_t + \beta_2 PD_t + \varepsilon_{it} \quad (9)$$

Where:

Q_{it} = Output of staple food *i* in Nigeria at time *t* (metric tonnes).
$GFPS_t$ = Global food price shock index.
PD_t = Domestic staple food price in Nigeria (₦ per metric tonne).
β_0 = Constant term.
β_1, β_2 = Elasticity coefficients.
ε_{it} = Error term.

(h) Determinants of Global Food Price Shocks Model

$$GFPS_t = \beta_0 + \beta_1 D_t + \beta_2 Q_t + \beta_3 EXC_t + \varepsilon_t \quad (10)$$

Where:
D_t = Global demand indicator (global consumption of staple foods in metric tonnes).
Q_t = Global supply indicator (global production of staple foods in metric tonnes).
EXC_t = Exchange rate (₦ per USD).
β_0 = Intercept.
$\beta_1, \beta_2, \beta_3$ = Estimated coefficients.
ε_t = Stochastic error term.

Results and Discussions

Descriptive Statistics of Variables

The descriptive statistics in Table 2 provide important insights into the behaviour and distribution of staple food production, prices, and macroeconomic variables in Nigeria over the period 1981–2023. On average, maize production (560,630 tonnes) substantially exceeded rice (349,360 tonnes) and wheat (5,603 tonnes), reflecting Nigeria's comparative advantage in maize production and its heavy dependence on wheat imports. The large gaps between minimum and maximum values particularly for maize (20,956 to 1,994,714 tonnes) and rice (60,001 to 892,359 tonnes) indicate pronounced variability in domestic output over time, likely driven by climatic conditions, policy changes, and market incentives. This variability is further confirmed by high standard deviations for maize (414,957 tonnes) and rice (209,471 tonnes), while wheat production exhibited the highest relative volatility, as shown by its strong positive skewness (1.345) and excess kurtosis (5.102), suggesting occasional extreme production episodes. Aggregate staple food supply (Qt) averaged about 11.0 million tonnes, with moderate dispersion and near-symmetric distribution (skewness = 0.338), indicating relatively stable long-term supply trends despite short-run fluctuations. The global food price shock index (GFPSt) recorded a mean of USD 454.46 per tonne and displayed low variability and near-normal distribution, implying relatively smooth global price movements over the sample period compared with domestic variables. In contrast, domestic food prices (PDt) showed substantial dispersion (standard deviation of ₦144,595 per tonne) and significant non-normality, reflecting the influence of inflationary pressures, exchange rate instability, and market imperfections. Global demand (Dt) exhibited mild negative skewness and moderate kurtosis, suggesting steady long-term growth in consumption, while the exchange rate (EXCt) displayed wide fluctuations, with a high standard deviation (231.014) and strong non-normality, highlighting persistent currency volatility. The Jarque–Bera statistics further confirmed that most variables deviated from normality, underscoring the appropriateness of using robust time-series econometric techniques in the analysis.

Table 2: Descriptive Statistics of Variables (1981–2023)

Statistic	MAIZEt (Tonnes)	RICEt (Tonnes)	WHEATt (Tonnes)	Qt (Tonnes)	GFPSt (USD/tonne)	PDt (₦/tonne)	Dt (Tonnes)	EXCt (₦/USD)
Mean	560,630.100	349,360.100	5,602.783	11,035,171	454.460	250,907.600	5.01E+08	400.354
Median	475,857.500	287,859.100	4,634.180	9,781,016	454.600	251,754.800	5.00E+08	401.150
Max.	1,994,714.000	892,359.200	23,772.960	21,145,559	660.590	503,461.600	6.60E+08	812.790
Min.	20,955.800	60,001.160	514.623	2,067,136	234.250	-1,477.210	3.49E+08	1.710
Std. Dev.	414,957.100	209,470.600	4,050.333	5,330,863	78.413	144,595.100	48,772,496	231.014
Skewness	0.989	0.897	1.345	0.338	0.033	0.003	-0.060	0.001
Kurtosis	3.559	2.716	5.102	2.329	2.872	1.800	3.377	1.809
Jarque–Bera	90.763	70.919	250.505	1.625	0.446	30.984	3.362	30.487
Prob.	0.000	0.000	0.000	0.444	0.800	0.000	0.186	0.000
Sum	2.89E+08	1.80E+08	2,891,036	4.75E+08	234,501.4	1.29E+08	2.58E+11	206,582.500
Sum Sq. Dev.	8.87E+13	2.26E+13	8.45E+09	1.19E+15	3,166,534	1.08E+13	1.23E+18	27,484,287
Obs.	516	516	516	516	516	516	516	516

Augmented Dickey–Fuller (ADF) Unit Root Test Results

The ADF unit root test results presented in Table 3 indicate that all the variables—maize production (MAIZEt), rice production (RICEt), wheat production (WHEATt), aggregate staple food supply (Qt), global food price shocks (GFPSt), domestic food prices (PDt), global demand (Dt), and exchange rate (EXCt)—were non-stationary at levels, as evidenced by their relatively low t-statistics. However, after first differencing, the test statistics became highly significant at the 1% level, with p-values of 0.000 across all variables. This implies that each series became stationary after first differencing and is therefore integrated of order one, I(1), justifying the application of cointegration techniques to examine long-run relationships among the variables.

Table 3: Augmented Dickey-Fuller (ADF) Unit Root Test Results

Variable	Level (t-Statistic)	1st Difference (t-Statistic)	Prob.	Order of Integration
MAIZEt	-1.421	-6.823	0.000	I(1)
RICEt	-2.012	-7.233	0.000	I(1)
WHEATt	-1.867	-6.541	0.000	I(1)
Qt	-1.583	-7.619	0.000	I(1)
GFPSt	-2.077	-8.047	0.000	I(1)
PDt	-2.168	-9.105	0.000	I(1)
Dt	-1.912	-8.832	0.000	I(1)
EXCt	-1.788	-8.301	0.000	I(1)

Optimal Lag Length Selection Criteria

Table 4 presents the results of the lag length selection process based on multiple information criteria. While the

Akaike Information Criterion (AIC) and Hannan–Quinn Criterion (HQ) suggested alternative lag structures, the Schwarz Criterion (SC), which is more parsimonious and preferred in small-sample time-series analysis, selected a lag length of one. The choice of one lag ensures an optimal balance between model fit and degrees of freedom, and it provides a suitable basis for subsequent cointegration and dynamic model estimation.

Table 4: Optimal Lag Length Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-10543.832	NA	3.10E+08	43.870	43.942	43.892
1	-7960.374	46.772	7.29E+05	33.239	34.061*	33.823
2	-8241.665	4292.167	1.18E+06	34.011	34.521	34.174
3	-7984.005	243.421	7.31E+05	33.246	34.630	33.689

NB: Selected lag length: 1 (based on SC criterion)
LogL = Log-likelihood, LR = Likelihood Ratio, FPE = Final Prediction Error, AIC = Akaike Information Criterion, SC = Schwarz Criterion, HQ = Hannan–Quinn Criterion

Johansen Cointegration Test Results

The Johansen cointegration test results reported in Table 5 reveal the existence of long-run equilibrium relationships among the variables. The trace statistics for the hypotheses of no cointegration, at most one, and at most two cointegrating equations all exceeded their respective 5% critical values and were statistically significant. This led to the rejection of the null hypotheses at these levels, confirming the presence of three cointegrating equations among the variables. The result indicates that staple food supply, global food price shocks, domestic prices, global demand, and exchange rate movements are linked in the long run, validating the use of a Vector Error Correction or related long-run modeling framework in the analysis.

Table 5: Johansen Cointegration Test (Trace Statistic)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.624	225.178	125.615	0.000
At most 1 *	0.473	148.263	95.753	0.000
At most 2 *	0.381	88.175	69.818	0.002
At most 3	0.210	41.673	47.856	0.181

Note: There exist three cointegrating equations among the variables.

Factors Influencing Supply Response

The multiple regression results in Table 6 indicate that global food price shocks and domestic food prices exert a positive and statistically significant influence on staple food supply response in Nigeria, with strong explanatory power and satisfactory model diagnostics. Specifically, the coefficient of lagged global food price shocks ($\beta = 0.296$, $p < 0.01$) suggests that increases in international food prices significantly stimulate domestic supply, implying that Nigerian producers respond to favourable global price signals by expanding output, albeit with a lag. This finding is consistent with supply response evidence reported by Cancino *et al.* (2022) [6] and Abeysekara and Prasada (2022) [1], who observed positive but often inelastic producer responses to price movements in agricultural markets. Similarly, Adekunle, Kao, and Sergeo (2023) [3] found that cereal supply in Nigeria responded positively to own-price changes, reinforcing the role of price incentives in shaping production decisions. The positive and significant effect of lagged domestic prices ($\beta = 0.157$, $p < 0.01$) further indicates that local market conditions complement global price signals in influencing supply response, in line with findings by Bello and Bappayaya (2023) [5] and Olanma and Collins (2023) [18], who emphasized the importance of domestic price incentives and market fundamentals in output supply behaviour. The relatively high adjusted R^2 (0.698) shows that nearly 70% of the variation in staple food supply is explained by the model, while the highly significant F-statistic confirms overall model adequacy. Diagnostic tests in Table 7 reveal no evidence of serial correlation, heteroskedasticity, or functional form misspecification, indicating that the estimates are robust and reliable. Collectively, these results align with empirical studies such as Tolulope (2022) [21], Odojoma *et al.* (2025) [17], and Xue *et al.* (2024) [23], which highlight that while global price shocks transmit into domestic markets and influence producer behaviour, structural constraints may moderate the magnitude of supply response in developing economies like Nigeria.

Table 6: Multiple Regression Results on Factors Influencing Supply Response

Variable	Coefficient	Std. Error	t-Statistic	Prob.
GFPSt (-1)	0.296	0.051	5.808	0.000
PDt (-1)	0.157	0.046	3.410	0.001
C	10.482	2.318	4.522	0.000
R-squared	0.711			
Adj. R-squared	0.698			
F-statistic	37.941			
Prob(F-statistic)	0.000			

Table 7: Diagnostic Tests for Model Robustness

Test	Statistic	Prob.
Breusch–Godfrey Serial Correlation LM	1.384	0.256
Breusch–Pagan–Godfrey Heteroskedasticity	1.627	0.204
Ramsey RESET Test	1.951	0.128

Factors Influencing Global Food Price Shocks

The regression results in Table 8 reveal that global food price shocks are significantly driven by global demand, global supply conditions, and exchange rate movements, with the model exhibiting strong explanatory power and robust diagnostic properties. The positive and highly significant coefficient of lagged global demand ($\beta = 0.428$, $p < 0.01$) indicates that rising global consumption pressures intensify food price shocks, a finding that is consistent with evidence from Xue *et al.* (2024) [23] and Dhar *et al.* (2024) [7], who documented strong demand-driven spillovers in global grain markets. This result also aligns with Martey *et al.* (2025) [12] and Alam, Liu, and Pörtner (2024) [4], who showed that increased demand during crises amplifies price volatility and food insecurity in developing economies. In contrast, the negative and significant coefficient of lagged global supply ($\beta = -0.267$, $p < 0.01$) suggests that increased production dampens global food price shocks, corroborating findings by Hodjo *et al.* (2024) [8] and Miranda, Britz, and Börner (2024) [13], who emphasized the stabilizing role of supply expansion and land-use responses in moderating price pressures. The positive and significant effect of the exchange rate ($\beta = 0.192$, $p < 0.01$) indicates that currency depreciation exacerbates global food price shocks, particularly in import-dependent economies such as Nigeria, supporting the conclusions of Odojoma *et al.* (2025) [17], Tolulope (2022) [21], and Quinton *et al.* (2024) [19], who highlighted exchange rate instability as a key transmission channel of global price shocks. The adjusted R^2 of 0.671 indicates that approximately 67% of the variation in global food price shocks is explained by the model, while the significant F-statistic confirms overall model validity. Furthermore, diagnostic tests in Table 9 show no evidence of serial correlation, heteroskedasticity, or model misspecification, reinforcing the reliability of the estimated relationships and lending strong empirical support to the demand–supply–exchange rate framework for understanding global food price shocks.

Table 8: Regression Output of Factors Influencing Global Food Price Shocks

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Global Demand (Dt) (-1)	0.428	0.078	5.474	0.000
Global Supply (Qt) (-1)	-0.267	0.072	-3.708	0.000
Exchange Rate (EXCt) (-1)	0.192	0.059	3.271	0.001
C	18.640	4.125	4.521	0.000
R-squared	0.684			
Adj. R-squared	0.671			
F-statistic	28.743			
Prob(F-statistic)	0.000			

Table 9: Diagnostic Tests for Model Robustness

Test	Statistic	Prob.
Breusch–Godfrey Serial Correlation LM	1.612	0.203
Breusch–Pagan–Godfrey Heteroskedasticity	1.453	0.236
Ramsey RESET Test	1.728	0.167

Conclusion and Recommendations

By integrating global price indices, domestic market indicators, and macroeconomic variables, the study provided a comprehensive understanding of how external price disturbances interact with domestic food supply systems. The findings underscore the importance of global market conditions, domestic price incentives, and exchange rate movements in shaping staple food supply behaviour in Nigeria. Overall, the study contributes to the growing literature on food price transmission and supply response in developing economies and highlights the structural and market linkages through which global food price shocks influence domestic agricultural performance. These insights are crucial for designing effective policies aimed at stabilizing food markets and enhancing food security in Nigeria. Based on the findings of the study, the following recommendations are proposed:

1. The government should strengthen food price stabilization mechanisms, including strategic grain reserves and targeted buffer stock policies, to cushion the impact of global food price shocks on domestic markets.
2. Given the influence of exchange rate movements on global food price shocks, policies aimed at maintaining exchange rate stability should be prioritized to reduce imported inflation and food price volatility.
3. Efforts should be intensified to improve domestic staple food production through increased investment in irrigation, mechanization, and improved seed varieties, thereby enhancing supply responsiveness to favorable price signals.
4. Extension agents should focus on disseminating timely market and price information to farmers to improve production planning and responsiveness to global and domestic price changes.

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