



IMPACT OF STOCK MARKET VOLATILITY ON FOOD PRICES IN NIGERIA

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<https://doi.org/10.70118/aijbfd.02012026002>

KEYWORDS

EGARCH Model, Food Prices, GARCH Model, Stock Market Volatility

ABSTRACT

This study is motivated by the persistent rise in food price amid increasing fluctuations in the Nigeria stock market. Hence, this study investigated the impact of stock market volatility on food prices in Nigeria using monthly time series data from January 2008 to December 2024. Heteroscedasticity and serial correlation test were conducted to ascertain the volatility behaviour. The generalized autoregressive conditional heteroscedasticity (GARCH) and the exponential GARCH (EGARCH) models were used for estimation. The finding revealed that the volatility of all share index, market capitalization and number of deals traded on the Nigeria stock market have significant positive effect on food commodity prices. The number of deals traded showed the strongest influence on food prices, indicating that stock market instability contributes to food price increase in Nigeria. It is therefore concluded that there is evidence of volatility persistent in the market. The diagnostic test confirmed the appropriateness of the estimated models. The study recommend that financial regulators should strengthen risk-monitoring system and introduce early warning mechanism to manage volatility shocks and stabilize food prices in Nigeria.

ARTICLE HISTORY

Received: 03/05/2025
Revised form: 23/06/2026
Accepted: 04/07/2026
Available online: 28/07/2026

Published by Department of Finance, University of Abuja, Nigeria.

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1. Introduction

The economy of Nigeria has a close connection with her stock market and commodity sectors, and it has a significant effect on the nation's stability and development. The Nigerian stock market which has her new name as Nigerian Exchange Group (NGX) is a platform for investment opportunities, capital formation and wealth creation, that shows any investor sentiment and financial landscape. Also, prices of essential commodities for key exports like agricultural products (staple foods), are key in economic performance for their great contributions on export earnings and government revenues. And the rate of volatility displayed by the NGX and the commodity prices is reasonable. Instability in commodity prices, mostly staple foods, have deep effects on macroeconomic stability and market performance. Simultaneously, there have been significant volatility in the Nigerian stock market that showed in fluctuations in the All-share index, the trading volumes and the market capitalization (Nigerian Exchange Group [NGX], 2024). Several studies show that food price shocks take instability across economic sectors, and influence the flow of investment and the risk views within financial markets (Hamilton, 2020; Kilian & Zhou, 2022). Volatility in Nigeria market is caused by elements like political instability, investor

confidence shift, doubt in financial landscape, and lastly regulatory changes. And again, fluctuations in commodity price in Nigeria are formed by global supply and demand dynamics, geopolitical unrest, exchange rates, and the challenges on local production. Olayungbo and Olayemi (2021) stressed that it is important to understand the way changes in stock market volatility and commodity price interact in Nigeria. Shocks in commodity markets always wave through the financial system, having impact on the behaviours of investors and the aggregate performance of the market. The new rise in the volatility of commodity prices has added to the broader market uncertainties that endangers both the national and global food security (Kang et al., 2024). With the rising volatility, discussions on policy have focused mainly on price-level relationships as those of agricultural goods, and the role of volatility overlooked.

The swings in prices of agricultural products, now, have being a major worry for families, investors, and the government. The Agricultural, sector rely solely; on agricultural products for food and nutrition (World Bank, 2023; IMF, 2023). Economic planning and policymaking unpredictability in Nigeria is more difficult when it comes to ensuring food security and sustainable growth. The volatility on national economic targets and household

welfare negative effect are alarming. Imported commodities are vulnerable to naira fluctuations, as instability in food price particularly, leads to significant economic implications for developing countries, and food revenue gives portion of government income and the export earnings.

Over time, the persistent escalation in the prices of essential commodities such as food, with limited comprehension of how stock market volatility influences the price, has become a growing concern for both policymakers and the general public in Nigeria. On a global scale, commodity price instability within agricultural sector continues to pose a threat to food security, as smallholder farmers who are most vulnerable to income shocks tend to fall short of the capital invested in the farming business which in turn discourages them from taking part in the future farming investments and this is because of the market uncertainty (Theophilus et al., 2024; Food and Agricultural Organization FAO, 2022). Uncertainty about agricultural commodity prices is one of the biggest obstacles to stable economic growth and food security in Nigeria. Stylized facts demonstrated that Nigeria recorded over 30% rate of inflation on food in 2024-2025, while there was substantial exhibition of fluctuations in the Nigerian stock market amid currency depreciation,

macroeconomic uncertainties and policy reforms.

Examining those dynamics is essential for having proper knowledge on financial market commodity price linkages in Nigeria. The relationship between food prices and stock market volatility operates through income effects, inflations expectations, investment flow changes and exchange rate movement. On the basis of this, it is therefore pertinent to ask if stock market volatility has any consequential effect on food prices in Nigeria considering the period under investigation.

Most of the studies reviewed employed advanced model that has not fully captured the weak institutions, the structural inefficiency and the information asymmetric of developing financial market. Most studies focused on sectors like agriculture and macroeconomic determinant of process without comprehensively integrating stock market volatility indicators like the all-share index, market capitalization and number deals traded on the floor the Nigeria exchange group. There has not been sufficient investigation on volatility persistent and asymmetric effects using both GARCH and EGARCH framework across different commodity categories especially the food commodity prices. Particularly during the period of economic shocks and reforms. Following the background of the

introductory section of this study, the section two comprises the literature review, section three captures the methodology and section four contain the result and analysis of discussion, the paper is concluded in section five.

2.0 Literature Review

2.1 Conceptual Review

Okorie and Lin (2021) and Kumari et al.(2023) sees stock market as a place where buyers and sellers come together to exchange intrinsic commodities like shares, stocks, or bonds, raising long-term capital for the modernization and expansion of projects by governments, businesses, and related parastatals. In consonance to this view, Badmus and Ojelade, (2022), opined that stock market serves as a key driver of economic growth and social development in both developing and advanced economies. It functions as a linkage between those who have funds in excess (surplus unit) and those in need of fund (deficit unit), by intermediation and render support to modernize the financial sector. Stock market volatility (Adegboyo & Sarwar, 2025; Nigerian Exchange Group, 2024) is the degree of fluctuation in stock prices or market indices over time. It shows the uncertainty and risk associated with financial market performance. Volatility effects is more pronounced during periods of economic crises, policy reforms,

exchange rate adjustments, external shocks like the COVID-19 pandemic and also the commodity price shocks and financial liberalisation.

Gupta and Mishra (2024) see volatility as the statistical variance in stock returns, highlighting its importance in assessing risk, building investment portfolios, and pricing financial derivatives. Kang et al. (2025) argue that real economic activity is a major tool for shaping stock market volatility, as it determines the price behaviour.

Food prices represent the current market values at which staple food like grains, rice and other edible raw materials or goods are traded by consumers in the market at a particular period. Prices of food directly affect poverty levels, household welfare, overall inflation, nutritional outcomes, in developing economies where food accounts for large share of household expenditure. The prices are majorly significant during disruptions in supply chain, currency depreciation and agricultural shocks and economic recessions (Essien et al., 2024; Jerumeh, 2022; National Bureau of Statistics, 2025).

According to the Central Bank of Nigeria, 2025; International Monetary Fund, 2025; World Bank, 2025, several transmission channels enable stock market volatility to affect food prices. Amongst those channels are reduce investment in agriculture and

food supply chains, weaken investor confidence, alter inflation expectations and influence exchange rates. Fertilisers, processed foods and machinery are imported inputs in Nigeria that are sensitive to fluctuations and exchange rate movements in the financial market which indirectly contribute to higher food prices. Consequently, stock market volatility serves as a leading indicator of changes in food inflation through its effects on economic activity, macroeconomic stability and liquidity conditions.

2.2 Theoretical Framework

On the basis of theory, the Efficient Market Hypothesis (EMH), first introduced by Eugene Fama in his 1965 dissertation and later formalized in *Efficient Capital Markets: A Review of Theory and Empirical Work* (Fama, 1970), remains one of the foundational theories in modern financial economics. The core premise of EMH is that asset prices in financial and commodity markets fully and instantaneously reflect all available information. With this framework, it is not possible for investors to regularly surpass the market through predictive strategies without substituting higher risk. Basically, there is swift amendment in variations as soon as a new information emerge and market prices at any given period are considered “fair,” (Downey, 2024). With its significant impact in academic and

professional finance circles, the EMH is the subject of fair criticism. It is criticised that markets are usually influenced by investor’s unreasonable behaviour, driven by emotions, herd behaviour, cognitive biases such as overconfidence, speculation, and loss aversion. Scholars like Robert Shiller (2017) in behavioural economics, argues that asset bubbles like the global financial crisis of 2008 and the dot-com bubble provide convincing evidence that markets do not often behave efficiently. Also, Zhang and Broadstock (2020) underline the role of social and psychological influences in investment decisions that always swerve from the logical assumptions in EMH. The EMH theory maintains that stock market prices rapidly capture the available information, so therefore, stock market volatility reflects new information about macroeconomics conditions like commodity price dynamics and inflation expectations. Thus, persistent rise in stock prices transmit signals that affect prices through expectation channels, investment and exchange rate, which makes EMH an ideal guiding theory for this study Fama Eugene (1970)

2.3 Empirical Review

Several empirical studies have been conducted to provide more knowledge on the impact of stock market volatility on commodity prices, while some of the

findings produce varying outcome, some lend credence to the ongoing debate.

Kang et al. (2024) carried out an investigation on fluctuations in stock market volatility and its influence on commodity prices. Using a time-varying risk aversion mechanism from 1999 to 2021, on a daily data. The study applied a Time-Varying Structural-Form Vector Autoregressive (TVSVAR) model, evaluating both aggregate and sector-specific commodity prices, with sixteen distinct commodities. The study found that the stock market volatility impact on commodity prices is not stable but changes over time. The effect is more pronounced in the energy commodity sector than in agricultural and metal commodity sectors. Also, findings show that persistent adverse effects caused by investor risk aversion resulted in a stronger influence on commodity prices than the expected volatility in the stock market.

Theophilus et al. (2024) in another paper, conducted an analysis of price volatility in agricultural commodities across two major Nigerian markets, Lagos and Ibadan, from 2013 to 2022. Using the discrete maximum likelihood estimation method, to show regional differences in price stability. The findings of the study reveal that certain commodities show greater price stability in the Lagos market, and others in Ibadan.

Indicating that the fluctuation of agricultural commodity prices can be impacted by regional market dynamics, due to disparities in supply chains, infrastructure, market efficiency and consumer demand, between locations. Making a valuable contribution by highlighting the importance of regional market dynamics in agricultural price volatility within Nigeria.

Although the research focus is on food price, but to lend credence to the findings, Oloruntoba (2024) investigated oil price volatility and sectorial stock returns in Nigeria, he used Exponential Generalized Autoregressive Conditional Heteroskedasticity (E-GARCH) on daily data to test the significance levels and asymmetry of information of both banking and oil & gas stock returns. Findings show that oil price volatilities significantly impact both banking and oil & gas sector stock returns, with information asymmetry (good vs. bad news) affecting sectors differently. The relevancy of this study to this research lies in its demonstration that oil and price volatility has direct and significant effects on stock market performance in Nigeria. However, there are limitations related to model scope, omission of key macroeconomic variables and lack of spill over analysis.

Dinku (2024) evaluated the dynamics of agricultural commodity price indices in

Ethiopia, with retail price data of agricultural commodities in five categories, cereals, pulses, oilseeds, root crops, and spices using Laspeyres average production quantity weighting index approach for a period of ten years from 2010 to 2020. The study found that prices of agricultural commodities showed an ever increasing trend in all the three regional states and the Addis Ababa city administration despite the fact that there were variations across the areas. This study contributes to the research work by providing a structured index-based analysis of agricultural commodities, which is useful for understanding price trends, inflationary pressures and sectoral performance. The limitations of this study is in relation to stock market volatility and commodity price interactions.

In another study, Olorunmola et al. (2024) in their paper “The Impact of Production Cost, Exchange rate and Inflation rate on Food Prices in Nigeria: Consequences for Food Security” identified the major cause of food price increase, examined the short run analysis and enumerated the inflationary implications of the increase and proffer possible ways to manage food prices in Nigeria using Johansen’s co-integration technique and Vector Error Correction Model (VECM) from 1986-2023.

What is evident in the reviewed literature is that, there are still several real gaps in the

empirical studies, while most studies focused mainly on developed economies and specific commodity sectors like agriculture, with limited applicability to emerging economies such as Nigeria. Most of the studies reviewed employed advanced model that may not fully capture the structural inefficiency, weak institutions and information asymmetric of developing financial market.

The studies focused on sectors like agriculture and macroeconomic determinant of process without comprehensively integrating stock market volatility indicators like the all-share index, market capitalization and number deals traded on the floor the Nigeria exchange group. Again, many studies did not sufficiently investigate volatility persistent and asymmetric effects using both GARCH and EGARCH framework across different commodity categories especially the food commodity prices. Thus, there is limited empirical evidence on how stock market volatility affect food commodity prices in Nigeria. Particularly during the period of economic shocks and reforms. Hence this study fill this gap by providing a component analysis of stock market volatility on food commodity prices in Nigeria using both GARCH and EGARCH MDOELS alongside key macroeconomic variable such as exchange rate.

3.0 Methodology

3.1 Sources of Data

This study depends entirely on secondary time series data covering January 2008 to December 2024, stemming in a symmetrical panel of 204 monthly data for each of the variables to be studied. The timeframe is experimentally and tactically applicable, for it includes some key events or periods in Nigeria that have shaped the country's economic landscape and market condition. Amongst which are the economic crunch era in 2008, the 2016 economic recession, the COVID-19 epidemic-induced world-wide slowdown, the oil price doom in 2020, and the after-pandemic economic rebound period. This seventeen-year window permits for a rigorous temporal view that allows the study to record both short-term shocks and long-run structural changes in commodity price and stock market dynamics. The data of this study is sourced from reputable institutions to ensure credibility and consistency across time.

The All Share Index (ASI), Number of Deals (NOD), and the Market Capitalization(MCap), that are stock market indicators are selected to stand for the price-level information and the trading activity in the market. The All Share Index is a standard gauge of the performance of the market while Number of Deals shows the participation of investors and liquidity,

and lastly Market Capitalization trends and the investment depth, were sourced from the Nigerian Exchange Group (NGX) and the Central Bank of Nigeria (CBN). Commodity price is measured as food commodity prices to show Nigeria's economic structure.

3.2 Variable Measurement The measurement of study variables is use to translate theoretical concepts into quantifiable and observable indicators. In this study, stock market volatility and food commodity prices are measured using established proxies that capture their fluctuations and dynamics over time. These measurements facilitate empirical analysis of the relationship between financial market instability and food price movements in Nigeria.

3.3 Estimation Techniques

3.3.1 Pre-Estimation Techniques

Descriptive Statistics are test conducted on

Variable	Proxy/Measure ment	Source	Description	Type of Variable
All Share Index (ASI)	Monthly stock index	NGX(2024)	The All Share Index (ASI) is the principal indicator of overall stock market performance. That measures the aggregate price movements of all listed equities on the Nigerian Exchange Group and reflects changes in market value and investor sentiment.	Independent variable
Number of Deals (NOD)	Monthly count of executed trades	NGX(2024)	The Number of Deals (NOD) is the total number of transactions executed in the stock market over a specified period.	Independent variable
Market Capitalization(MCAP)	Market capitalization	NGX/CBN(2024)	Market Capitalization (MCAP) refers to the total market value of all listed companies' outstanding shares on a stock exchange. MCAP reflects the size, depth, and growth of the stock market.	Independent variable
Food Price Index (FoodPI),	Weighted average of rice, wheat, maize prices	FAO(2024)	The Food Price Index (FPI) measures changes in the average prices of a basket of food commodities over time.	Dependent Variable
Stock Market Volatility (SMV)	GARCH(1,1) conditional variance	E-Views(2025)	Stock Market Volatility (SMV) is the degree of fluctuation in market returns or stock prices over a given period.	Independent variable
Exchange Rate	Nominal Exchange Rate deflated by price	CBN(2024)	The Exchange Rate (EXR) is the price of one country's currency in terms of another country's currency.	Control Variable

Source: Researcher's computation 2026.

The pre-estimation techniques follows a trend analysis of the series specifically, trends about the various indicators of stock market performance such as the All-share-index, market capitalization and number of deals traded on the floor of the Nigerian Stock Exchange (NGX), while the

the mean, the standard deviation, the skewness, the kurtosis and the Jarque-bera statistics to achieve the statistical properties of variables included for analysis. To provide valuable insights into the behaviour of the stock market indicators; especially with recourse to volatility clustering. For this study, there are two (2) unit-root tests carried out to ascertain the data

stability conditions of the variables included in the model of the study. The unit-root tests are the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) these tests data validity tests. The null hypothesis for the unit-root tests is that the series is unit-root.

The Pre-test for Volatility Modelling follows both the heteroscedasticity and serial correlation tests, conducted to examine the volatility behaviour inherent in the stock market. At first, the study used the Breusch-Godfrey Lagrange Multiplier (LM) test to check for serial correlation presence (or autocorrelation) in the residuals of the estimated model. Serial correlation is seen when error terms in different time periods are related, which negates the assumption of independence which cause inefficient parameter estimates. The Breusch-Godfrey test is best in this context because it allows for the identification of higher-order autocorrelation and is preferred for multivariate time series models.

The levels of significance for each of the measures of stock market is 10 percent, for all the variables resulted into rejecting the null hypothesis. Meaning that the residuals are free from serial correlation, making the reliability of inferences drawn from the model. Secondly, the study explores the White test for heteroscedasticity to examine the changes in variance of the residuals

across time. Heteroscedasticity means that the error term's variance changes over time, which can nullify the standard errors and the significance tests, to cause biased inferences. The White test is a general test for heteroscedasticity that does not rest on the assumption of normally distributed errors and is ok for large sample sizes, making it well-suited for the 204 monthly observations used in this research. If the null hypothesis of homoscedasticity is not rejected, it implies that the model satisfies the assumption of constant error variance.

3.3.2 Model Estimation

After the estimation of volatility using the GARCH model, the model is specified as thus:

3.3.2.1 Model Specification

GARCH Model

To get the quantity of volatility of the stock market, a Generalized Autoregressive Conditional Heteroskedasticity (GARCH) model was used. The GARCH (1,1) is seen as appropriate to capture time-varying volatility clustering.

The return series is denoted by $R_t = \log(P_t) - \log(P_{t-1})$ (3.1)

The conditional variance equation is specified as:

$$\sigma_t^2 = \alpha_0 + \alpha_1 \epsilon_{t-1}^2 + \beta_1 \sigma_t^2 \quad (3.2)$$

Where,

σ_t^2 = Conditional variance

ϵ_{t-1}^2 = Lagged squared residual

: $\alpha_0, \alpha_1, \beta_1$ = Estimation Parameters

ϵ_t = Vector of white noise error

3.3.2.2 EGARCH Model

The Exponential Generalized Autoregressive Conditional Heteroskedasticity (EGARCH) model is preferred to the conventional GARCH and Threshold GARCH (TGARCH) models because it effectively captures asymmetric volatility responses and leverage effects commonly observed in financial and commodity markets. Unlike the standard GARCH model, which assumes that positive and negative shocks have identical effects on volatility, EGARCH allows bad news and good news to exert different impacts on market volatility

Variance Equation:

$$\ln(\delta_t^2) = \omega + \beta \ln(\delta_{t-1}^2) + \alpha \left(\frac{|\epsilon_{t-1}|}{\delta_{t-1}^2} - E \left[\frac{|\epsilon_{t-1}|}{\delta_{t-1}^2} \right] \right) + \gamma \left(\frac{\epsilon_{t-1}}{\delta_{t-1}^2} \right) \quad (3.3)$$

Where;

$\ln(\delta_t^2)$: is the natural log of the conditional variance at time t . By predicting the log of variance, any predicted output exponentiates into a strictly positive variance.

ω : is the constant term, representing the baseline log variance.

β : is the GARCH coefficient; representing the persistence of volatility. A lower denotes that volatility shocks would not last and it would die out faster.

α : is the ARCH coefficient and it measures the effect of past shock on the current volatility.

$E(|Z|)$: is the absolute value of the standardized residual. It captures the stationarity of the volatility process as the ARCH effect is set to zero.

γ : is the symmetric or leverage effects; meant to ascertain if good news and bad news yield the same volatility effect. If the value of γ equals zero, impact of shock is symmetry but if less than zero, negative shock (i.e. bad news) generates more volatility than positive shocks (i.e. good news). However, the reverse holds, if the value of γ is greater than zero.

3.3.2.3 Mean Equation Model

Food commodity price Model .This model provides a framework for analysing how financial market developments and economic shocks affect food price behaviour and food inflation in an economy such as Nigeria.

$$Fp = f(Mcap, Nod, Asi, Inf, Int) \quad (3.4)$$

Econometrically written thus:

$$fp_t = \beta_0 + \beta_1 Mcap_t + \beta_2 Nod_t + \beta_3 Asi_t + \beta_4 Inf_t + \beta_5 Int_t + \mu_t \quad (3.5)$$

Where:

Fp = Food commodity price

β_0 = Is the intercept

$\beta_1 \beta_2 \beta_3 \beta_4 \beta_5$ = Are the coefficients

t =: Period

μ = Error term

To analyse the relationship between food prices in Nigeria and stock market volatility, the study explored a multi-step analysis strategy that allowed to measure volatility and its influence on commodity markets. Multivariate time series techniques were used to get the multifaceted nature.

3.3.3 Post estimation tests

These tests are basically five (5) in number. These are the test for remaining Auto-Regressive Conditional Heteroskedasticity effects, plot of conditional volatility and check for persistence of volatility shocks. The fourth is the standardized residual diagnostics. The test for the remaining ARCH effect is to ascertain if the model has been purged of all the volatility effects upon estimation. The analysis of the results would hinge on either GARCH or EGARCH; owing to the confirmation of remaining ARCH effects upon estimation. The conditional volatility plots is the visualization of the estimated conditional

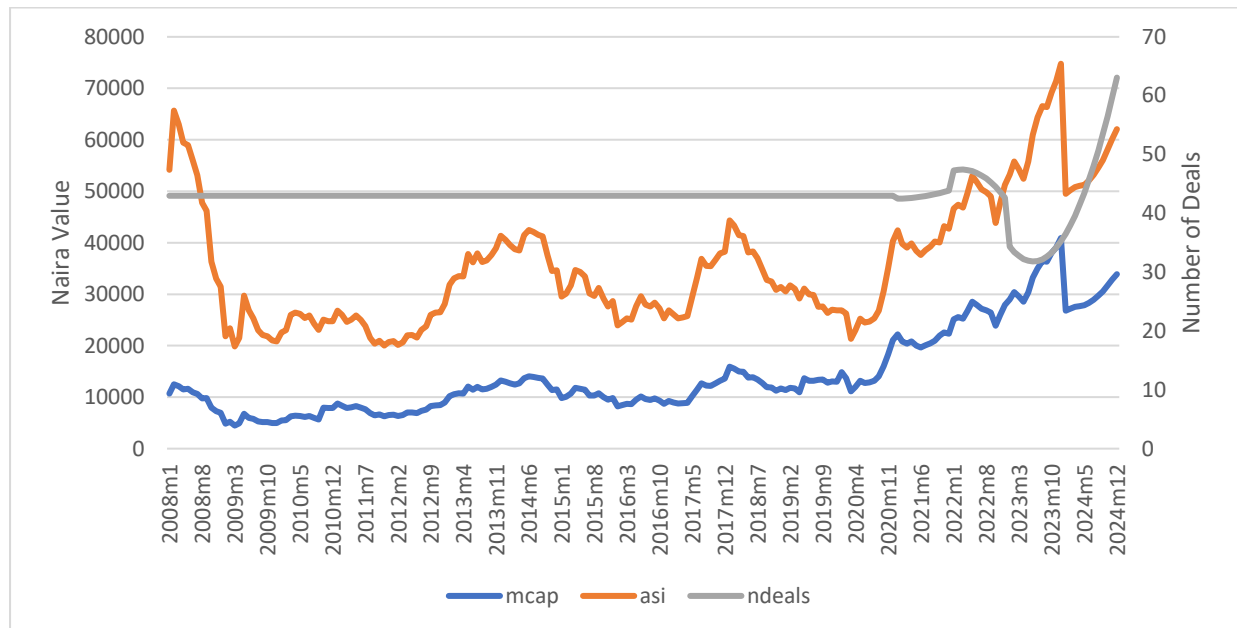
variance to verify that the model appropriately captures periods of high and low volatility inherent in the data.

4. Result and Discussion

4.1 Trend Analyses

The trend for the stock market hovers around three variables such as the all-share-index (ASI), market capitalization (MCAP) and number of deals (NDEALS). As depicted in Figure 1, the NDEALS remained constant at 43.0 point since 2008m1 and 2021m1 and by the end of 2021, it has negligibly increased to 43.88; precisely in 2021m12. The number of deals traded on the floor of the Nigerian stock exchange only becomes recently volatile since 2021m12. A substantial downswing occurred in 2023m11 that the number of deals declined from 43.88 for the earlier periods to 34.32.

Figure 1: Trends of Stock Market Behaviour in Nigeria (2008M1 – 2024M12)



Source: Theoretical Exposition, 2026.

4.2 Unit-Root and Stationarity Tests

As part of the data stability tests, two (2) tests were carried out and these tests are in the category unit-root tests. The unit-root tests are the Augmented Dickey Fuller (ADF) and Phillip-Peron (PP) tests. The results of these two tests are detailed in Table 3. As indicated for the ADF test, except for the number of deals (NDEALS) traded on the floor of the Nigerian Stock Exchange Market that is non-unit-root at levels, all the variables are all unit-root at levels; at least at the 5 percent level of significance. The null hypothesis for these two unit-root tests is that the variable is unit-root and this null hypothesis is only rejected for the number of deals (NDEALS) at the 5 percent level of significance but

could not be rejected for all the other variables; even at the 10 percent level.

However, the PP test indicates that all the variables are unit-root at levels; including the number of deals traded on the floor of the Nigerian stock exchange market (see Panel 1b of Table 1). Specifically, the null hypothesis of unit-root was rejected at levels (i.e. $I(0)$) for all the variables. At the $I(1)$, however, all the variables become non-unit-root. It is important to emphasize that the food prices (FPRICES) only became stationary at the integration of order 1 when it was taken at no trend and intercept while all the other variables were taken at default of trends and intercept. Altogether, none of the variables still remain unit-root afterwards. The implication is that all the variables become

non-unit-root once integrated at order 1 and strongly support the position that these

variables cannot be deployed for empirical analyses without being differenced.

Table 1: Result of Unit-Root Tests

S/N	Variables	Panel 2a: Augmented Dickey Fuller Unit-Root Test <i>Ho: Unit – Root</i>			Panel 2b: Phillip-Perron Unit-Root Test <i>Ho: Unit – Root</i>			Remark
		<i>I(0)</i>	<i>I(1)</i>	<i>Ho: r</i>	<i>I(1)</i>	<i>I(1)</i>	<i>Ho: r</i>	
1.	<i>ASI</i>	-1.422	-13.696***	Rejected	-1.686	-13.745***	Rejected	1(1)
2.	<i>EXCHR</i>	2.110	-6.853***	Rejected	-1.138	-14.025***	Rejected	1(1)
3.	<i>MCAP</i>	-0.006	-13.909***	Rejected	-0.006	-13.910***	Rejected	1(1)
4.	<i>NDEALS</i>	-3.381**	-	Rejected	-1.771	-7.876***	Rejected	1(1)
5.	<i>FPRICES</i>	-0.935	-13.625***	Rejected	18.842	-6.419***	Rejected	1(1)

Source: Researcher's Computations.2026.

Note: ***, **, denotes significance at the 1% and 5% levels respectively.

Nonetheless, this study is strongly guided by the results of the two earlier unit-root tests where the food prices (Fprices) became non-unit-root when integrated at the difference of order 1.

The results detailed in Table 2 indicates that the null hypothesis for constant variance is rejected at the 1 percent levels of significance for each of the measures of

stock market All Share Index (asi), market capitalization (mcap) and number of deals (ndeals). Consequently, this implies that stock market in Nigeria exhibits volatility behaviour (see Table 3).

4.3 Heteroskedasticity tests for Measures of Stock Market Behaviour

Table 2, Ho: Constant Variance

Variables	Chi-square (χ^2)	Prob. (χ^2)
<i>asi</i>	171.56	0.000
<i>mcap</i>	394.03	0.000
<i>ndeals</i>	12.21	0.000

Source: Researcher's Computations. 2026.

Also, the serial correlation tests are carried out at different lag lengths of 4, 8 and 12. This is imperative as the data is a monthly data and the rule of thumb is that a variable is lagged at its frequency of data generation. However, shorter lag periods of 4 and 8 were also estimated. The serial correlation results detailed in Table 3 suggest that the null hypothesis of no serial correlation cannot be rejected for two of the three variables. Precisely, the tests revealed that the null hypothesis of no serial correlation cannot be rejected for both the all-share-index and market capitalization; even at the 10 percent levels of significance. Meanwhile, the null hypothesis of no serial correlation is rejected for the number of deals at the 1 percent level of significance (Table 3). Put together, the volatility of Nigeria stock market appears to be majorly supported by heteroscedasticity test and slightly supported by the serial correlation test. The optimum lag which is lag 12 denote the possibility of volatility clustering that is typical of a financial sector .

Table 3: Serial Correlation Tests

Ho: No Serial Correlation

Variables	Lag 12	
	χ^2	Prob. (χ^2)
<i>asi</i>	10.235	0.595
<i>mcap</i>	6.705	0.876
<i>ndeals</i>	104.909	0.000

Source: Researcher's Computations. , 2026.

As evident in the results contained in Table 3, the volatility of the all-share-index (*asi*) and market capitalization (*mcap*) have small but significant magnitudes that have significant positive effects on food prices in Nigeria. These two variables have t-statistics value of 2.94 and 8.75 respectively; with corresponding 0.001 and 0.001 probability values. More so, the volatility of number of deals traded on the stock exchange market has significant positive impact on the food prices with 1.645 coefficient but 3.28 t-value with corresponding probability values of 0.001. These imply that stock market volatility in Nigeria have positive significant impact of increasing food prices in the country. However, the exchange rate has negligible

positive impact on the food prices with 0.016 coefficient, 0.55 t-statistics and corresponding 0.585 probability values. Since the probability is insignificant, it does not have impact

The constant value of 1.676 is significant at the 1 percent level with 7.18 t-statistics and 0.000 probability values respectively. This suggests that food prices remain significantly positive without the effect of stock market volatility.

Table 4: Results of EGARCH Estimates for Food Price Changes

D.fprices	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
asi.D1	0	0	-2.94	.003	-.001	0	***
mcap.D1	.002	0	8.75	0	.001	.002	***
ndcal.D1	1.645	.501	3.28	.001	.662	2.628	***
exchr.D1	.016	.029	0.55	.585	-.041	.073	
Constant	1.676	.233	7.18	0	1.219	2.133	***
egarch.L1	.916	.017	55.03	0	.884	.949	***
arch.L1	.023	.004	5.43	0	.014	.031	***
tarch.L1	-.02	.004	-5.21	0	-.028	-.013	***
Constant	.105	.023	4.61	0	.061	.15	***
Mean dependent var	4.483		SD dependent var	5.885			
Number of obs	203		Chi-square	128.383			
Prob > chi2	0.000		Akaike crit. (AIC)	1102.418			

*** $p < .01$,

Source: Researcher's Computations, 2026.

As regards the variance equation in Table 4 the coefficients of the ARCH and EGARCH effects are positive and significant with 5.43 and 55.03 t-values. These correspond to 0.000 probability values respectively. On the other hand, the coefficient of the TARCH effect is negative at -0.02 and absolute t-statistics value of 5.21 with 0.000 probability value respectively. As evident, the addition of these coefficients does not exceed 1 and this implies that the volatility shocks are

non-explosive and would die out overtime. Hence, the stock market in Nigeria would become stationary overtime. The significance of the ARCH, TARCH and EGARCH effects strongly lend credence to the significance of these effects and that they truly exist. The coefficient of 0.023 for the ARCH effect is very low and indicates that the market reacts sluggishly to sudden news. The 0.916 coefficient of the EGARCH coefficient shows the presence of volatility persistence and that the past

low volatility tends to linger on for a very long time.

In Table 4, when compared the coefficients of the Akaike Information Criteria (AIC) for both the EGARCH (1102.42) and GARCH (905.92) models show that the latter is more efficient than the latter. However, only the coefficient for the number of deals traded on the floor of the Nigerian stock market is significant with 6.58 t-statistics value and corresponding 0.000 probability value (Table 5. Besides, the addition of the coefficients for both the ARCH and GARCH terms; 1.203 and 0.365 respectively, are greater than 1. This

indicates that the volatility process is explosive and imply that volatility shocks persist indefinitely in the Nigeria commodity markets. In fact, the higher value of 1.203 for the ARCH effects means that the food commodity market in Nigeria reacts intensely to sudden news (see Table 5). The number of deals traded on the floor of the Nigerian stock market has 5.067 coefficient with 6.58 t-statistics value with 0.000 probability value. But, other measures of stock market volatility posed not just negligible magnitude but negligible impact on food commodity prices.

Table 5: GARCH Estimates for Food Price Changes

D.fprices	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
asi.D1	0	0	1.61	.108	0	0	
mcap.D1	0	0	-1.16	.244	-.001	0	
ndeals.D1	5.067	.77	6.58	0	3.557	6.577	***
exchr.D1	.019	.016	1.22	.222	-.012	.05	
Constant	1.201	.06	19.99	0	1.084	1.319	***
arch.L1	1.203	.528	2.28	.023	.169	2.238	**
tarch.L1	-.086	.455	-0.19	.851	-.977	.806	
garch.L1	.365	.078	4.68	0	.212	.518	***
Constant	.014	.024	0.58	.563	-.033	.06	
Mean dependent var	4.483		SD dependent var	5.885			
Number of obs	203		Chi-square	52.923			
Prob > chi2	0.000		Akaike crit. (AIC)	905.924			

*** $p < .01$, ** $p < .05$,

Source: Researcher's Computations, 2026.

3.5 Diagnostic test

For the model diagnostic test, several diagnostics test were considered appropriate for the estimations of GARCH models and these include the test for remaining ARCH effects, plot of conditional volatility and check for persistence of volatility shocks. The fourth is the standardized residual diagnostics. The estimation of the GARCH model and followed by the test for remaining ARCH effects is meant to check if the order of ARCH and GARCH terms introduced into the model is appropriate or required that it is increased or that alternative asymmetric ARCH/GARCH models are considered. The rule of thumb is that a significant p-value would implies that the null hypothesis is rejected and indicating that the ARCH

effects still remain. However, an insignificant p-value indicates that the null hypothesis cannot be rejected and would indicate that there is no ARCH effect left and this would not suggest the estimation of an alternative asymmetric model of volatility different from that estimated already for analysis and discussion.

For the GARCH model estimated, it is evident that the null hypothesis of no ARCH effects cannot be rejected, even at the 10 percent levels of significance; when modelled with the GARCH effect. For this, the estimations of model is free from any ARCH effect after estimations. The test for the remaining ARCH effect is to ascertain if the model has been purged of all the volatility effects upon estimation.

Table 6: Remaining ARCH Effects for Food Prices

H0: no ARCH effects vs. H1: ARCH (p) disturbance.

LM test for ARCH chi2	Df	Prob>Chi2
2.886	1	0.089
2.943	2	0.230
3.103	3	0.376
3.118	4	0.538
3.417	5	0.636

Source: Researcher's Computations, 2026.

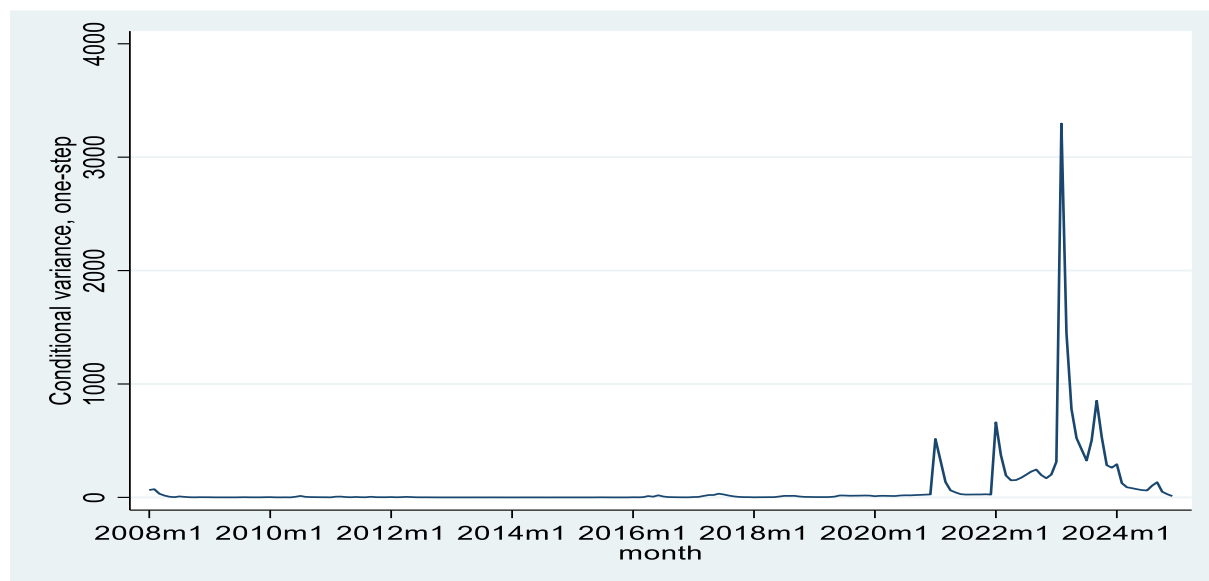
GARCH model was the appropriate model for stock market volatility on food price, changes in the Nigerian economy with the GARCH effects while EGARCH model

was the appropriate model with the EGARCH effects. The Conditional Volatility Plots is the estimated conditional variance to verify that the model

appropriately captures periods of high and low volatility inherent in the data. The

conditional volatility plots for the models; is indicated in Figures 2

Figure 1: Trends of Stock Market Behaviour in Nigeria (2008M1 – 2024M12)



Discussion of findings

This study investigate the impact of stock market volatility on food prices in Nigeria, with specific objectives of analysing the impact of Stock market volatility on food prices in Nigeria. The study is anchored on The Efficient Market Hypothesis (EMH), first introduced by Eugene Fama in his 1965 dissertation and later formalized in Efficient Capital Markets. The core premise of EMH is that asset prices in financial and commodity markets fully and instantaneously reflect all available information. With this framework, it is not possible for investors to regularly surpass the market through predictive strategies without substituting higher risk. Basically, there is swift amendment in variations as soon as a new information emerge and market prices at any given period are

considered “fair,” (Downey, 2024). This theory corresponds with the concept of logical predictions, believing that all market participants approach insights rationally and modify their decisions appropriately. The Efficient Market Hypothesis stays fundamental in financial theory, offering information role and valuable understandings into price formation, it is seen as a hypothetical model rather than a fundamental rule. Practically, markets present various degrees of efficiency, which is usually impacted by institutional, psychological and structural elements .In emerging economy like Nigeria where market information may be divided and investor behaviour unpredictable, understanding the restrictions of EMH is key for researchers

and policymakers. A balanced perspective that blends both classical efficiency assumptions and behavioural insights is necessary for a more realistic analysis of market forces.

The volatility of the all-share-index (asi) and market capitalization (mcap) have small but significant magnitudes that have significant positive effects on food prices in Nigeria. These two variable have t-statistics value of 2.94, with corresponding 0.001 probability values. The volatility of number of deals traded on the stock exchange market has significant positive impact on the food prices with 1.645 coefficient but 3.28 t-value with corresponding probability values of 0.001. These imply that stock market volatility in Nigeria have positively significant impact of increasing food prices in the country. However, the exchange rate has negligible positive impact on the food prices with 0.016 coefficient, 0.55 t-statistics and corresponding 0.585 probability values. The constant value of 1.676 is significant at the 1 percent level with 7.18 t-statistics and 0.000 probability values. This suggests that food prices remain significantly positive without the effect of stock market volatility. As regards the variance equation, the coefficients of the ARCH and EGARCH effects are positive and highly significant with 5.43 and 55.03 t-values. the findings of this study aligns with the findings of Ikemenogo

(2024); Olorunmola et al. (2024) and Mohommad et al. (2023) who reported that heightened volatility in food prices significantly disrupts economic growth and contributes to greater inflation variability. These correspond to 0.000 probability value. On the other hand, the coefficient of the TARCH effect is negative at -0.02 and absolute t-statistics value of 5.21 with 0.000 probability value respectively. As evident, the addition of the coefficient does not exceed 1 and this imply that the volatility shocks are non-explosive and would die out overtime. Hence, the stock market in Nigeria promises to become stationary overtime. The significance of the ARCH, TARCH and EGARCH effects strongly lend credence to the significance of these effects and that they truly exist.

The coefficient of 0.023 for the ARCH effect is very low and indicates that the market reacts sluggishly to sudden news. The 0.916 coefficient of the EGARCH coefficient shows the presence of volatility persistence and that the past low volatility tends to linger on for a very long time. When compared, the coefficients of the Akaike Information Criteria (AIC) for both the EGARCH (1102.42) and GARCH (905.92) models show that the latter is more efficient than the latter. However, only the coefficient for the number of deals traded on the floor of the Nigerian stock exchange market is significant with 6.58 t-statistics

value and corresponding 0.000 probability value (see Table 7). Besides, the addition of the coefficients for both the ARCH and GARCH terms; 1.203 and 0.365 respectively, are greater than 1. This indicates that the volatility process is explosive and imply that volatility shocks persist indefinitely in the Nigeria commodity markets.

5. Conclusion and Recommendation

This study investigated the impact of stock market volatility on food commodity prices in Nigeria using time series monthly data from January 2008 to December, 2024. Using GARCH and EGARCH framework. From the estimated result, the volatility of the all-share-index (asi) and market capitalization (mcap) have small but significant magnitudes that have significant positive effects on food prices in Nigeria. More so, the volatility of number of deals traded on the stock exchange market has significantly positive impact on the food prices. These imply that stock market volatility in Nigeria have positive significant impact of food prices in the country. However, the exchange rate has no significant positive impact on the food prices .This mean that food prices is significantly positive without the effect of stock market volatility.

Based on the findings, it is recommended that financial market regulators implement

policies aimed at mitigating the transmission of stock market volatility to food prices. In addition, regulators should strengthen market surveillance by adopting advanced risk-monitoring and early-warning systems capable of detecting abnormal volatility spikes in both the stock market and commodity sectors. Such systems may include Value-at-Risk (VaR) and Conditional Value-at-Risk (CVaR) frameworks for assessing potential losses and extreme market risks, as well as GARCH-based volatility forecasting models for identifying volatility clustering and emerging market uncertainties. The adoption of these tools would enable regulators to respond promptly to market disturbances, thereby preventing volatility from becoming excessive, persistent, and detrimental to food price stability and overall economic welfare.

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