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Effect of Agricultural Subsidies on Food Production and Prices in Nigeria: 1980 – 2024

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ABSTRACT

This study analyzed the effect of agricultural subsidies on food production and prices in Nigeria from 1980 to 2024, with the broad objective of determining their short-run and long-run impacts. The specific objectives were to analyze the trends, examine the long-run relationship, determine the short-run and long-run effect and analyze the causal relationships between agricultural subsidies, agricultural GDP, and food prices. The methodology employed time-series data and the Autoregressive Distributed Lag (ARDL) model, complemented by the Granger causality test. The main results revealed that all variables exhibited fluctuating trends over the study period. The unit root test (Table 1) established that agricultural GDP and food prices were stationary in first differences (I(1)), while agricultural subsidies were stationary at the level (I(0), justifying the use of the ARDL approach. The bound test (Table 2) and the error-correction model (Table 3) confirmed a significant long-run relationship with disequilibrium correcting at annual rates of 26.02% and 25.18% for agricultural GDP and food prices respectively. The short-run estimates (Table 4) showed that a 1% increase in subsidies led to a 0.99% increase in agricultural GDP and a 1.12% decline in food prices. In the long run (Table 5), a 1% increase in subsidies led to a 0.067% rise in agricultural GDP and a 0.042% fall in food prices. The Granger causality test (Table 6) indicated a unidirectional causality running from agricultural subsidies to both agricultural GDP and food prices. The trend analysis (Figures 3, 4, and 5) visually depicted the historical fluctuations of the key variables. The study concludes that agricultural subsidies are a significant driver of increased agricultural output and reduced food prices in Nigeria in both the short and long run. It is recommended that the government should enhance and sustain transparent agricultural subsidy programs, use subsidies to lower input costs for farmers and implement protective trade policies to stabilize the agricultural goods and services market and promote sustainable growth.

1.0 Introduction

An agricultural subsidy is a government incentive to farmers and agribusinesses to supplement their income, manage the supply of agricultural commodities, and influence the cost and supply of such commodities (Animba *et al*., 2024). These subsidies come in various forms, including direct payments, tax reductions, and price supports. They aim to enhance food security, ensure stable farmer incomes and promote economic growth in the agro food system (Anderson & Martin, 2018). Many countries employ subsidies to encourage agricultural development and reduce dependence on food imports.

Agricultural subsidies have been an important part of agricultural policies in the governments of both developing and developed countries (Ajibare, 2022).It can come in so many forms like the credit grants to farmers, interest free loans, fertilizer subsidy (reduction in the cost of fertilizer), seed subsidy, machinery subsidy (reducing the cost of hiring farm implements like tractor, plough, harrow, harvester etc.) and also pesticides, herbicides and insecticide subsidy. In other words, subsidy in agriculture is geared towards reduction in cost of procuring agricultural inputs (materials like fertilizer that can be used to improve agricultural yield). Public interest is also an important factor which agricultural subsidies are meant to address (Umeh

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and Adejo, 2023). Reduced price of agricultural produce is achieved by subsidies from the government. Though a school of thought opines that subsidies may lead to increased taxes, lead to inefficient producers and distort the free market mechanism already in place (Idrees *et al*., 2024).
Historically, agricultural subsidies have played a critical role in boosting food production. In the United States, for instance, the Farm Bill has provided substantial subsidies to farmers since the 1930s (Orden & Zulauf, 2020). Similarly, the European Union's Common Agricultural Policy (CAP) supports farmers by providing direct payments and market interventions, ensuring food affordability and stability.

Developing nations also utilize agricultural subsidies, albeit with varying degrees of effectiveness. In Nigeria, for example, fertilizer subsidy programs have improved food production, but issues like corruption and misallocation of resources remain challenges (Ogunleye & Ayinde, 2019). India's minimum support price (MSP) policy ensures farmers receive fair prices for their crops, thereby sustaining agricultural livelihoods (Gulati & Narayanan, 2021).

Despite their benefits, subsidies can sometimes lead to market distortions. For instance, overproduction of specific crops can drive prices down, leading to wastage and environmental degradation (Sumner, 2019). Additionally, some subsidies disproportionately benefit large-holders farmers while smallholders farmers struggle to access financial aid (Jayne *et al*., 2018).
Subsidies also affect global trade dynamics. Countries providing excessive subsidies may create unfair competition, making it difficult for unsubsidized farmers in developing nations to compete in international markets (WTO, 2020). This issue has been a point of contention in World Trade Organization (WTO) negotiations, as developing countries seek fairer trade policies.

Furthermore, while subsidies help stabilize food prices for consumers, they can also place significant financial burdens on governments. Countries with limited budgets may struggle to sustain these programs, leading to policy inconsistencies and reduced effectiveness over time (Swinnen & Knops, 2019).
Technological advancements also influence how subsidies impact agriculture. Precision farming and genetically modified crops, supported by subsidies, have increased yields in developed nations, while traditional farming methods persist in less-developed regions (Pingali, 2021). The disparity in technology adoption further exacerbates inequalities in food production. As global food demand rises due to population growth, agricultural subsidies remain a crucial policy tool. However, balancing their benefits with potential drawbacks is essential to ensure sustainable agricultural development and food security worldwide (FAO, 2022).

Despite continuous implementation of agricultural subsidy programs in Nigeria, including input subsidies (fertilizers, seeds), price support mechanisms, and export incentives, the nation still faces persistent challenges in achieving food self-sufficiency, stable agricultural growth, and affordable food prices. While these subsidies are intended to reduce production costs, boost agricultural output, and curb food price volatility, their effectiveness has often been undermined by poor targeting, late disbursement, corruption and inconsistent policy frameworks. For example, the Growth Enhancement Support Scheme (GESS), though initially successful in increasing input uptake, experienced setbacks in sustainability and market reach following budgetary constraints and policy withdrawal. Meanwhile, food inflation remains alarmingly high, surpassing 40% in 2024 (NBS, 2024) and agricultural GDP growth remains below potential, suggesting a weak linkage between subsidies, production, and final consumer prices. These inefficiencies raise critical concerns about the actual short-run and long-run impacts of subsidies on the agricultural sector and national food security.

Most existing studies in Nigeria focus either on the effect of subsidies on farm-level productivity or input access, with limited exploration into how these subsidies influence macroeconomic variables such as agricultural GDP and food prices over time. Additionally, little attention has been given to the dynamic and causal relationships, particularly how shocks in agricultural subsidies due to policy shifts, economic crises, or global market changes affect food production and price behavior in both the short and long run. Few empirical works utilize robust econometric techniques such as Vector Autoregression (VAR) to model the feedback effects and time-lagged impact of subsidies on the food system. This study aims to fill this critical gap by analyzing both the direct and indirect effects of agricultural subsidies on food production and prices in Nigeria from 1980 to 2024. It also examines the response of agricultural

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GDP and food prices to subsidy shocks, offering a more holistic understanding that can inform targeted, evidence-based policy reforms.

1.1 Objectives of the Study

i. analyze the trend of agricultural GDP, agricultural subsidies and food prices in Nigeria;
ii. analyze the long-run relationship between agricultural GDP, food prices and agricultural subsidies in Nigeria;
iii. determine the short-run effect of agricultural subsidies on agricultural GDP and Food prices;
iv. determine the long-run effect of agricultural subsidies on agricultural GDP and Food prices; and
v. analyze the causal relationship between agricultural GDP, food prices and agricultural subsidies.

2.0 Methodology

2.1 The Study Area

Nigeria is a prominent country in West Africa, situated between latitudes 4°N and 14°N and longitudes 3°E and 15°E (Adegboye et al., 2021). It is bordered by Benin Republic to the West, Niger Republic to the North, Chad to the Northeast, and Cameroon to the East, with a Southern coastline along the Atlantic Ocean's Gulf of Guinea (NPC, 2023). Covering an area of approximately 923,769 km², Nigeria is the most populous country in Africa, with an estimated population of over 220 million people as of 2025 (World Bank, 2024). Abuja, located near the geographic center (around 9.0579°N, 7.4951°E) serves as the capital while Lagos (approx. 6.5244°N, 3.3792°E) remains the economic and commercial center of the country (UN-Habitat, 2023).

The geography of Nigeria is highly diverse, encompassing coastal plains, tropical rainforests, savannahs and arid Sahel regions (Olanrewaju & Aremu, 2022). The Southern part of the country experiences a humid tropical climate, while the northern part is drier with distinct wet and dry seasons (NIMET, 2023). Nigeria's two major rivers, the Niger and the Benue, converge at Lokoja and form a critical inland water system that supports agriculture, fishing and transportation (Iloeje, 2020). These ecological zones facilitate a wide range of agronomical practices from root and tuber crops like cassava and yam in the south, to cereal and legume cultivation in the North making agriculture a major source of livelihood for rural communities (FAO, 2022; Oyekale, 2021).

Economically, Nigeria has a mixed economy with key sectors including agriculture, oil and gas, manufacturing, trade, and telecommunications (IMF, 2023). Nigeria continues to grapple with significant challenges, including infrastructure deficits, and poverty (UNDP, 2023; Akinyemi *et al*., 2021). Despite these challenges, Nigeria remains a strategic player in African development and governance, (AfDB, 2024). Its socio-economic and environmental diversity makes it a critical study area for research across sectors such as agriculture.

2.2 Method of Data Collection

The data for this study were collected from secondary source. Time series data from 1980 – 2024 were collected on agricultural subsidies, agricultural GDP and agricultural prices from FAO data base.

2.3 Method of Data Analysis

Both descriptive and inferential statistics were used for data analysis. Unit root test was carried out to determine the stationarity or otherwise of the time series using Augmented Dickey Fuller Unit Root test. Specific objective (i) was analyzed using trend analysis. Specific objective (ii) was analyzed using Autoregressive Distributed Lag (ARDL) model co-integration bound test. Specific objectives (iii) and (iv) were analyzed using Autoregressive Distributed Lag (ARDL) model. Specific objective (v) was analyzed using Granger causality test. Hypothesis (i) was analyzed using the result of the Autoregressive Distributed Lag (ARDL) model co-integration bound test. Hypotheses (ii) and (iii) were analyzed using the result of the Autoregressive Distributed Lag (ARDL) model. Hypothesis (iv) was analyzed using the result of the Granger Causality test. The choice of ARDL model was based on the result of the unit root test which showed mixed integration among the time series.

2.4 Model Specification

Augmented Dickey-Fuller (ADF) Unit Root Test

The first step in time series analysis is to test whether the data series are stationary, meaning their statistical properties such as mean and variance do not change over time. Most macroeconomic time series are non-stationary in levels and must be differenced to achieve stationarity. The Augmented Dickey-Fuller (ADF) test, developed by Dickey and Fuller (1979), extends the basic Dickey-Fuller test by

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including lagged difference terms to account for higher-order serial correlation.

The ADF test is based on the following regression equation:

$\Delta Y_t = \alpha + \beta t + \gamma Y_{t-1} + \Sigma \delta_i \Delta Y_{t-i} + \varepsilon_t$ ……(1)

- Where:
- ΔY_t is the first difference of the variable of interest (e.g., food production, food prices, or subsidies),
- α is the intercept,
- βt is the deterministic time trend,
- γ tests for the presence of a unit root,
- p is the optimal lag length selected using Akaike Information Criterion (AIC) or Schwarz Bayesian Criterion (SBC),
- ε_t is the white noise error term.

The null hypothesis H_0: $\gamma = 0$ (unit root present) is tested against the alternative H_1: $\gamma < 0$ (stationary series). If the test statistic is more negative than the critical value, we reject the null hypothesis, implying stationarity. If the variables become stationary only after first differencing, they are said to be integrated of order one, denoted as I(1).

Estimation of short-run and long-run effects

Autoregressive distributed lag (ARDL) model

ARDL method is considered suitable in this study for estimating short run and long run effects because it proposes a test for cointegration that is robust to whether the variables of interest are I(0), I(1), or mutually cointegrated. Furthermore, this approach considers the problems of endogeneity as well as calculates the short-and long-run coefficients individually in a single model, and is a suitable technique to be used when the integration order of variables are mixed of I (0) or/and I (1) (Saint Akadiri *et al*., 2019). In addition, a dynamic error correction model (ECM) can be derived from ARDL through a simple linear transformation and integrates the short-run dynamics with the long-run equilibrium without losing long-run information and avoids problems such as spurious relationship resulting from non-stationary time series data. Therefore, in order to estimate the short run and long run effects in the co-integrating equation, ARDL approach was used (Pesaran *et al*. 1999).

The study investigates the long-run and short-run effect of agricultural subsidies on agricultural GDP and food prices within the ARDL framework as follows:

$\text{LnAgriculturalGDP}_{it} = \alpha_i + \sum^{p}_{j=1} \delta_{ij}\text{lnAgricGrowth}_{it-1} + \sum^{q}_{j=0} \beta_{ij}X_t + \sum^{q}_{j=0} \omega_{ij}Z_{t-j} + \varepsilon_{it}$ …....(2a)

$\text{LnFood prices}_{it} = \alpha_i + \sum^{p}_{j=1} \delta_{ij}\text{lnFoodprices}_{it-1} + \sum^{q}_{j=0} \beta_{ij}X_t + \sum^{q}_{j=0} \omega_{ij}Z_{t-j} + \varepsilon_{it}$ …....(2b)

Here,

Independent Variable = (lnAgricsubsidies)

In Equation (2a) and (2b), X_t is the vector of the independent variables, Z_t is the vector of the lagged independent variables, while α_i is the AgricGDP (Foodprices) fixed effects, δ_{ij} is the coefficient of the lagged lnAgricGDP_{it} (lnFoodprices) and β_{ij} represents the coefficients of the independent variables while ω_{ij} represents the coefficients of the lagged independent variables.

The ARDL model by modifying the above equation into the error correction term (ECT) is as follows:

$\Delta\text{lnAgricGDP}_{it} = \varepsilon_{10} + \theta_i\Delta\text{lnAgricGDP}_{it-1} + \phi_i\Delta\text{lnX}_{it-1} + \sum^{p-1}_{j=1} \delta_{ij}\Delta\text{lnAgricGDP}_{it-1} + \sum^{q-1}_{j=0} \beta_{ij}\Delta\text{lnX}_t + \sum^{q-1}_{j=0} \omega_{ij}\Delta\text{lnZ}_{t-j} + u_{1it}$ **. …..(3a)**

$\Delta\text{lnFoodprices}_{it} = \varepsilon_{10} + \theta_i\Delta\text{lnFoodprices}_{it-1} + \phi_i\Delta\text{lnX}_{it-1} + \sum^{p-1}_{j=1} \delta_{ij}\Delta\text{lnFoodprices}_{it-1} + \sum^{q-1}_{j=0} \beta_{ij}\Delta\text{lnX}_t + \sum^{q-1}_{j=0} \omega_{ij}\Delta\text{lnZ}_{t-j} + u_{1it}$ **……..(3b)**

The first part of equation (3a) and (3b) with θ_i and ϕ_i represents long run dynamics of the model. The second part with δ_{ij} , β_{ij} and ω_{ij} represents short run relationship. In equation (3a) and (3b), θ_i denotes the coefficient of speed of adjustment to the long-term status. ϕ_i in equation (3a) and (3b) represents the estimated long-run coefficients for the independent variables X_t. The null hypothesis in the equation is $\theta_i + \phi_i = 0$, which means non-existence of long run relationship.

Where:

AgricGDP_{it} = Annual Agricultural GDP in percent

Foodprices_{it} = Food Price in Naira

$\text{Agricsubsidies}_{it}$ = Annual Agricultural Subsidies in Naira

Granger Causality Test

The Granger causality test (Granger, 1969) is applied to assess the direction of causality among the variables. It is particularly useful in determining whether agricultural subsidies cause changes in food production and prices, or vice versa.

The Granger causality framework estimates:

$Y_t = \Sigma \alpha_i Y_{t-i} + \Sigma \beta_j X_{t-j} + \varepsilon_t$ ……..(4)

If the lagged values of variable X (e.g., subsidies) significantly improve the prediction of variable Y (e.g., food prices), then X Granger-causes Y. The null hypothesis is H_0: variable X does not Granger-cause Y. Rejection of the null implies a unidirectional or bidirectional causality.

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3.0 Results and Discussion

3.1 Trend of Agricultural GDP, Food Prices and Agricultural Subsidies

Trend of agricultural GDP

The trend analysis in Figure 3 showed that there was a drop in agricultural GDP between 1980 and 1982. It remained constant between 1982 and 1985 after which it rose steadily between 1985 and 2021. It drop again steadily between 2021 and 2024.

Trend of food prices

The trend analysis in Figure 4 showed that there was a steady rise in food price between 1980 and 1981. It dropped steadily between 1981 and 1985. It rose again steadily between 1985 and 2000. Thereafter it maintained a continuous rise and fall trend between 2000 and 2024.

Trend of agricultural subsidies

The trend analysis in Figure 5 showed that agricultural subsidies maintained a steady rise between 1980 and 2000. It declined again between 2000 and 2004 and thereafter it rose again in 2005 and remained constant up till 2014. It dropped again between 2014 and 2015 and thereafter rose again and remained constant between 2015 and 2024.

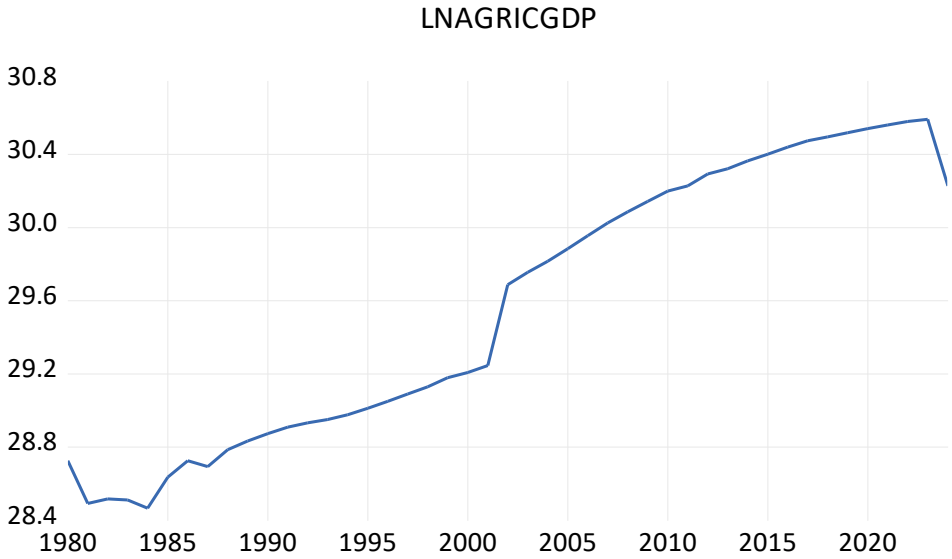

Figure 3: Graph showing Trend of Agricultural GDP

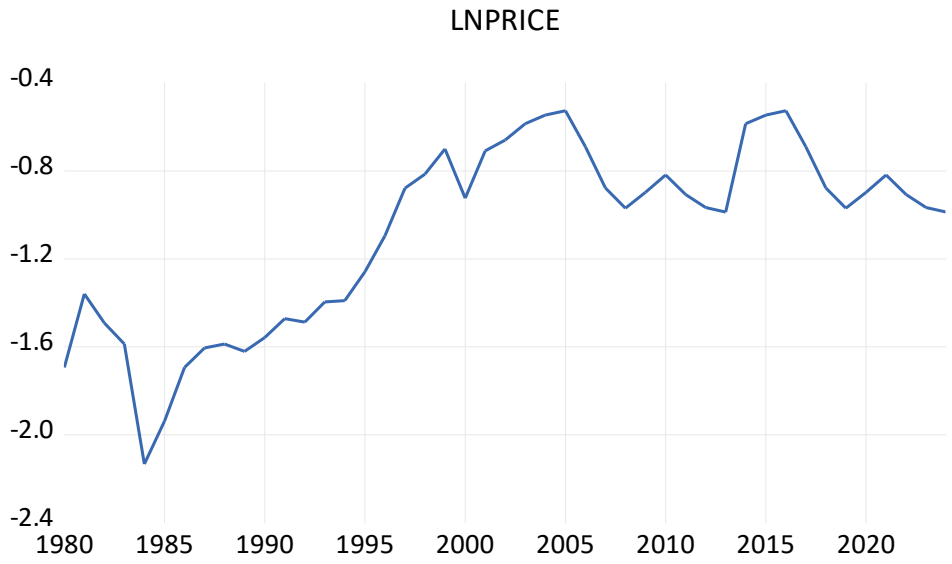

Figure 4: Graph showing Trend of Food Prices

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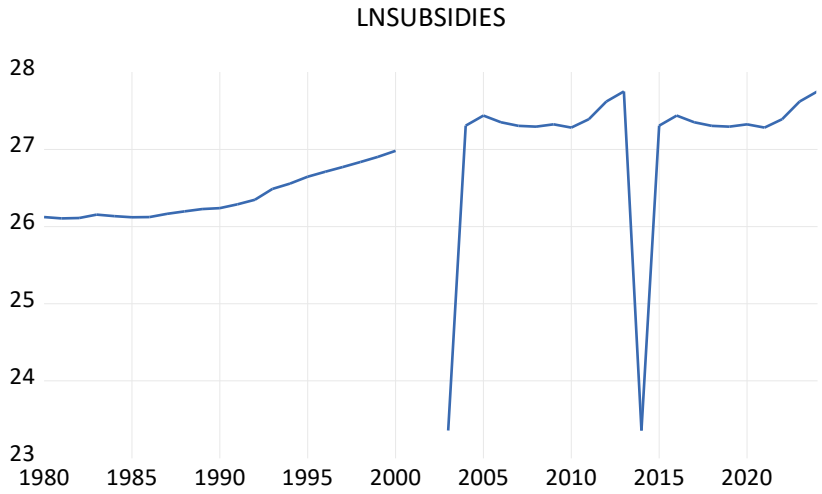

Figure 5: Graph showing Trend of agricultural subsidies

Unit Root Test

The results of the unit root test for all the variables are presented in Table 1. The results indicated that agricultural GDP in levels have unit roots and is therefore not stationary at levels. Therefore, the null hypothesis of no unit roots is rejected at 1% level of significance. Similarly, the results indicated that food prices in levels have unit roots and is therefore not stationary at levels. Therefore, the null hypothesis of no unit roots is rejected at 1% level of significance. The presence of unit root implies that the stochastic properties of the time series such as the mean, variance and covariance of the mean time series are not constant and hence cannot be used for predicting the future. It shows a systematic pattern that is unpredictable. However, these variables were stationary at first difference. The implication of stationarity at first difference is that it is possible to apply analytical tools and theoretical results developed for stationary time series to the differenced non-stationary time series.

This means that the first differencing was enough to make these variables stationary, suggesting that they are integrated of order one, I(1). This stationarity in their first difference is attributable to their constant stochastic properties, hence useful for future prediction.

On the other hand, agricultural subsidies was stationary at levels, implying that this variables has no unit roots. This implies that this variable is flat looking series, without trend, constant variance over time, a constant autocorrelation structure over time and no periodic fluctuations, suggesting that they are integrated of order zero, I(0).

Table 1: Augmented Dickey-Fuller Unit Root Test

Variables	**Level**			**First Difference**		
	t-statistics	**p-value**	**Decision**	**t-statistics**	**p-value**	**Decision**
Agricultural GDP	-0.721555	0.8306	Unit root	-5.117513	0.0001**	No unit root
Food Prices	-1.708752	0.4200	Unit root	-6.157287	0.0000**	No unit root
Agricultural Subsidies	-6.564593	0.0000**	No unit root	-3.353559	0.0000**	No unit root

Source: Data Analysis Results, 2025
**p-value is significant at 1% level
Result is based on Mackinnon (1996) one-sided p-values.
Lag length is automatically based on Akaike Information Criteria (AIC)

Long-Run Relationship between Agricultural GDP, Food Prices and Agricultural Subsidies

ARDL bound test for cointegration is presented in Table 2. ARDL bound test for cointegration by Pesaran *et al*. (2001) was performed. Given that the sample consists of 44 observation, the F-statistic of Narayan (2005) critical values was also performed which is suitable for the bound testing approach in a small sample. The final ARDL models for agricultural

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GDP model and food prices model were selected based on Akaike information criterion (AIC). The results are presented in Table 2. The F-statistic values of 7.370028 (for agricultural GDP model) and 6.950435 (for food price model) are greater than the upper bound critical value of both Pesaran *et al*. (2001) and Narayan (2005) at 1% level rejecting the null hypothesis of no long run relationship (no Cointegration) between the dependent variables and independent variable.

The error correction term (ECM_{t-1}) is as desired to prove the presence of cointegration. The sign of ECM_{t-1} should be negative and significant. As shown in Table 3, the error correction term (ECM_{t-1}) for agricultural GDP model is -0.260241 (p = 0.0043) while the error correction term (ECM_{t-1}) for food price model is -0.251799 (p = 0.0029). Therefore, it is confirmed that the variables: agricultural GDP and agricultural subsidies are cointegrated, while food prices and agricultural subsidies are also cointegrated. This means that any change in the current equilibrium level of the agricultural GDP (or food price) is a temporary phenomenon and will return to the long-run path in future. According to the magnitude of ECM_{t-1}, any deviation of the equilibrium for agricultural GDP model will be corrected at the speed of 26.02% annually, or the agricultural GDP will take approximately four years for full adjustment. Similarly, any deviation of the equilibrium for food price model will be corrected at the speed of 25.18% annually or the food price will take approximately four years for full adjustment.

Table 2: ARDL Bound Test Results for Long Relationship

Test Type	Null Hypothesis (H_0)	Test Statistics	Critical-values	Decision
Agricultural GDP				
ARDL Bound Test for Cointegration	No Long run relationship (No Cointegration)	7.370028	I(0): 4.94* I(1): 5.58*	Reject H_0
Food Prices				
ARDL Bound Test for Cointegration	No Long run relationship (No Cointegration)	6.950435	I(0): 4.94* I(1): 5.58*	Reject H_0

Source: Data Analysis Results, 2025

* Critical values for Narayana (2005) are from case II, restricted constant and no trend. These critical values are the correspondent values for k = 1, where k is the number of regressors. Rejection of H_0 is at 1% level.

Table 3: ARDL Error Correction (ECM)

Variable	Coefficient	Std Error	t-statistics	Prob.
ECM				
Agricultural GDP				
CointEq(-1)	-0.260241	0.062892	-4.137903	0.0043**
Food Prices				
CointEq(-1)	-0.251799	0.052079	-4.834943	0.0029**

Source: Data Analysis Results, 2025

**P-value is significant at 1%

Short-run Effect of Agricultural Subsidies on Agricultural GDP and Food Prices

In Table 4, the values of R^2 and adjusted R^2 show that over 99% of the variation in agricultural GDP is explained by changes in agricultural subsidies. The F-statistic value (1682.807) of the model is significant at 1% significance indicating that the overall performance of the model is sound.

The result in Table 4 revealed that agricultural subsidies exert a positive and significant effect on agricultural GDP in the short-run. This implies that as agricultural subsidies increase agricultural GDP increases. A quantitative evaluation of the effect of short-run coefficient of agricultural subsidies on agricultural GDP indicated that a 1% increase in agricultural subsidies causes a 0.99% rise in agricultural GDP in the short-run.

Similarly, in Table 4, the values of R^2 and adjusted R^2 show that over 90% of the variation in food prices is explained by changes in agricultural subsidies. The F-statistic value (63.31603) of the model is significant at 1% significance indicating that the overall performance of the model is sound.

The result in Table 4 indicated that agricultural subsidies exert a negative and significant effect on food prices in the short-run. This implies that as agricultural subsidies increase food prices decreases. A quantitative evaluation of the effect of short-run coefficient of

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agricultural subsidies on food prices indicated that a 1% increase in agricultural subsidies causes a 1.12% fall in food prices in the short-run.

Table 4: ARDL Model Estimates for Short run Effects of Agricultural Subsidies on Agricultural GDP and Food Prices

Variable	Coefficient	Std Error	t-statistics	Prob.
Short run Estimates				
Agricultural GDP				
C	0.381860	0.531968	0.717825	0.4771
LN Agric Subsidies	0.993976	0.018948	52.45930	0.0000**
R-square	0.988545			
Adjusted R-square	0.987958			
Log-likelihood ratio	46.36482			
F-statistics	1682.807			
Prob (F-statistics)	0.000000**			
Akaike info criterion	-2.064991			
Durbin-Watson stat	2.134095			
Food Prices				
C	1.096029	0.708479	1.547018	0.1314
LN Agric Subsidies	-1.118116	0.154272	-7.247687	0.0000**
R-square	0.905601			
Adjusted R-square	0.891298			
Log-likelihood ratio	25.70329			
F-statistics	63.31603			
Prob (F-statistics)	0.000000**			
Akaike info criterion	-2.010425			
Durbin-Watson stat	1.973278			

Source: Data Analysis Results, 2025
**P-value is significant at 1%

Long-run Effects of Agricultural Subsidies on Agricultural GDP and Food Prices

The result in Table 5 revealed that agricultural subsidies exerted a positive and significant effect on agricultural GDP in the long-run. This implies that as agricultural subsidies increase agricultural GDP increases in the long-run. A quantitative evaluation of the effect of long-run coefficient of agricultural subsidies on agricultural GDP indicated that a 1% increase in agricultural subsidies causes a 0.067% rise in agricultural GDP in the long-run.

Similarly, the result in Table 5 indicated that agricultural subsidies exerted a negative and significant effect on food prices in the long-run. This implies that as agricultural subsidies increase food prices decreases in the long-run. A quantitative evaluation of the effect of long-run coefficient of agricultural subsidies on food prices indicated that a 1% increase in agricultural subsidies causes a 0.042% fall in food prices in the long-run.

Causality between Agricultural GDP, Food Prices and Agricultural Subsidies

The result in Table 6 shows that the null hypothesis that agricultural subsidy does notGranger cause Agricultural GDP is rejected at 1% level of significance. The result also shows that the null hypothesis that agricultural GDP does not Granger cause agricultural subsidy is not rejected at 1% level of significance. The implication of this result is that unidirectional causality runs from agricultural subsidy to agricultural GDP within the period under review.

The result in Table 6 indicated that the null hypothesis that agricultural subsidy does not Granger cause food price is rejected at 5% level of significance. The result also indicated that the null hypothesis that food price does not Granger cause agricultural subsidy is not rejected at 5% level of significance. The implication of this result is that unidirectional causality runs from agricultural subsidy to food price within the period under review.

Table 5: ARDL Model Estimates for Long run Effects of Agricultural Subsidies on Agricultural GDP and Food Prices

Variable	Coefficient	Std Error	t-statistics	Prob.
Long run Estimates				
Agric GDP				
C	0.381860	0.531968	0.717825	0.4771
LN Agric Subsidies	0.067008	0.015350	4.365342	0.0001**
Food Prices				
C	1.096029	0.708479	1.547018	0.1314
LN Agric Subsidies	-0.042491	0.015473	-2.746138	0.0041**

Source: Data Analysis Results, 2025
**P-value is significant at 1%

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Table 6: Causality between Agricultural GDP, Food Prices and Agricultural Subsidies

Null Hypothesis	F-Statistic	Prob.
Food Prices does not Granger Cause Agricultural GDP	1.76422	0.1851
Agricultural GDP does not Granger Cause Food Prices	1.40985	0.2567
Agricultural Subsidies does not Granger Cause Agricultural GDP	5.53621	0.0083**
Agricultural GDP does not Granger Cause Agricultural Subsidies	0.08824	0.9157
Agricultural Subsidies does not Granger Cause Food Prices	6.96615	0.0029**
Food Prices does not Granger Cause Agricultural Subsidies	0.48468	0.6201

Source: Data Analysis Results, 2025
**P-value is significant at 1%

4.0 Conclusion and Recommendations

The study found that a long-run relationship exit between agricultural GDP, food price and agricultural subsidy As a result, any deviation of the equilibrium will be corrected at the speed of 26.02% (for agricultural GDP) and 25.18% (for food price) annually, or the agricultural GDP and food price will take approximately four years for full adjustment. The study further concluded that agricultural subsidy exerted a positive and significant effect on agricultural GDP in the short-run while it exerted a negative and significant effect on food price in the short-run. The study also, found that agricultural subsidy exerted a positive and significant effect on agricultural GDP in the long-run while it exerted a negative and significant effect on food price in the long-run. It is recommended that government policies aimed at enhancing access to agricultural subsidies are crucial for supporting increase in agricultural GDP. By enhancing access to agricultural subsidies, these policies help increase access to agricultural input among farmers and encourage investment in agricultural production In the same vein, government policies aimed at enhancing access to agricultural subsidies are crucial for supporting decrease in food prices. By enhancing access to agricultural subsidies, these policies help increase access to food and enhance food security in Nigeria and subsidies on agricultural inputs should be used to reduce the cost of fertilizers, seeds, and other inputs. These subsidies will help encourage farmers thereby promoting agricultural growth.

References

Abula, M., & Mohammed, M. (2013). *Impact of fertilizer subsidy on cassava production in Nigeria (1986–2010)*. Unpublished manuscript.

Adebayo, A. (2020). The impact of input subsidies on maize prices in Nigerian local markets. *Journal of Agricultural Economics, 15*(2), 45–60.

Adebayo, A. (2021). *Challenges of subsidy distribution and agricultural productivity in Benue State*. Nigerian Institute of Social and Economic Research.

Adepoju, A. (2018). Inconsistent subsidy distribution and its effect on farmer productivity. *African Journal of Agricultural Research, 12*(4), 112–125.

Adepoju, A. (2020). The Anchor Borrowers' Programme and agricultural output in Nigeria. *Central Bank of Nigeria Economic and Financial Review, 58*(1), 89–110.

Adetiloye, K. A. (2012). Agricultural financing in Nigeria and the Agricultural Credit Guarantee Scheme Fund (ACGSF). *International Journal of Finance and Accounting, 1*(7), 82–94.

African Development Bank Group. (2024). *African economic outlook 2024: Nigeria country report*. African Development Bank Group.

Agunwa, C. C., Inaya, L. O., & Proso, I. M. (2015). Impact of commercial banks' credits on agricultural productivity in Nigeria. *Journal of Economics and Sustainable Development, 6*(18), 131–140.

Ajibare, J. (2022). *Global perspectives on agricultural subsidies*. Greenfield Publishers.

Akinwumi, J. A. (2019). *Subsidies and the adoption of climate-smart agricultural practices in Nigeria*. University of Ibadan Press.

Akinwumi, J. A., & Abiola, O. S. (2019). Government intervention and agricultural productivity in Nigeria: A

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

Keynesian perspective. *Nigerian Journal of Agricultural Economics, 9*(1), 1–15.

Anderson, K., & Martin, W. (Eds.). (2018). *Distortions to agricultural incentives in Africa*. World Bank.

Associated Press. (2024). *Climate stressors and food distribution in West Africa*. Associated Press.

Ayanwale, A. B., Olatunji, S. O., & Adeyemi, O. A. (2021, October). Policy shifts and agricultural GDP in Nigeria. Paper presented at the Nigerian Economic Society Annual Conference, Abuja, Nigeria.

Central Bank of Nigeria. (2025). *Monetary Policy Committee communiqué*. Central Bank of Nigeria.

Chukwu, K. O., & Agbo, F. U. (2021). Designing transparent and targeted subsidy programs in Nigeria. *Journal of Development Studies, 45*(3), 201–218.

Eboh, E. (2017). Market distortions and inefficiencies from excessive intervention. *West African Journal of Agricultural Economics, 12*(2), 55–70.

Eboh, E. (2021). Input subsidies and price stability in the Nigerian rice market. *Journal of Food Security, 9*(1), 33–47.

Eboh, E. (2022). The National Agricultural Technology and Innovation Plan (NATIP) and digital subsidy distribution. *Nigerian Journal of Agricultural Policy, 8*(1), 10–25.

Egwu, P. N. (2006). *Impact of agricultural financing on agricultural output, economic growth and poverty alleviation in Nigeria*. Central Bank of Nigeria.

Eyo, E. O. (2019). The Growth Enhancement Support Scheme (GESS) and farmer exploitation in Nigeria. *International Journal of Social Economics, 46*(8), 1015–1030.

Eze, C. C. (2021). The multiplier effect of agricultural subsidies on the rural economy. *Journal of Rural Development, 40*(2), 155–170.

Federal Ministry of Agriculture and Rural Development. (2021). *Annual report on agricultural subsidies*. Federal Ministry of Agriculture and Rural Development.

Federal Ministry of Agriculture and Rural Development. (2023). *National agriculture investment plan (NAIP-II) progress report*. Federal Ministry of Agriculture and Rural Development.

Food and Agriculture Organization of the United Nations. (2022). *The state of food and agriculture 2022*. FAO.

Food and Agriculture Organization of the United Nations. (2024). *Global food price shocks and import dependence*. FAO.

Gulati, A., & Banerjee, P. (2021). *Subsidy policy coherence and inflation in developing economies*. International Food Policy Research Institute.

Gulati, A., & Narayanan, S. (2021). *The story of Indian agriculture: From food security to farm incomes*. Oxford University Press.

Headey, D., & Jayne, T. S. (2023). Stabilizing food prices through targeted subsidies. *World Development, 161*, Article 106120. https://doi.org/10.1016/j.worlddev.2022.106120

Idrees, M., Khan, S. A., & Chen, Y. (2024). The inefficiencies of producer subsidies and market distortion. *Journal of International Trade, 39*(1), 78–95.

International Food Policy Research Institute. (2023). *Input subsidies and crop output in Nigeria: An empirical review*. IFPRI.

International Food Policy Research Institute. (2025). *Policy recommendations for stabilizing food prices in Nigeria*. IFPRI.

International Monetary Fund. (2023). *World economic outlook: Nigeria*. IMF.

Kareem, R. O., Disu, A. B., & Ojo, O. O. (2013). Macroeconomic factors influencing agricultural output in Nigeria. *Journal of Economics and Sustainable Development, 4*(15), 88–96.

Kareem, R. O., & Olagunju, K. F. (2020). Market failures and the role of agricultural subsidies in Nigeria. *Journal of Agricultural Science and Technology, 22*(4), 890–905.

Keynes, J. M. (1936). *The general theory of employment, interest, and money*. Palgrave Macmillan.

National Bureau of Statistics. (2022). *National accounts statistics*. National Bureau of Statistics.

National Bureau of Statistics. (2024). *Consumer price index (CPI) and inflation report March 2024*. National Bureau of Statistics.

National Bureau of Statistics. (2025). *Consumer price index (CPI) and inflation report April 2025*. National Bureau of Statistics.

ISSN 2536-6084 (Print) & ISSN 2545-5745 (Online)

National Population Commission. (2023). *National population commission demographic data*. National Population Commission.

Nwafor, M., & Eboh, E. (2018). *Rice production and the Anchor Borrowers' Program in Benue State*. Nigerian Institute of Social and Economic Research.

Nwafor, M., Eboh, E., & Chukwuma, O. I. (2021). Fertilizer and seed subsidies on crop output in Nigeria. *African Journal of Agricultural and Resource Economics, 16*(2), 145–160.

Obasi, P. C., & Nwosu, A. C. (2018). Prolonged subsidy dependence and resource misallocation in Nigerian agriculture. *Journal of Policy Modeling, 40*(5), 1021–1037.

OECD. (2020). *Agricultural policy monitoring and evaluation 2020*. Organisation for Economic Co-operation and Development.

Ogunleye, A. S., & Ayinde, O. E. (2019). Corruption and misallocation in Nigerian fertilizer subsidy programs. *Journal of Development and Agricultural Economics, 11*(3), 72–81.

Ojo, M. A., & Adeniran, J. A. (2023). A VAR analysis of subsidy shocks on agricultural GDP and food prices in Nigeria. *Journal of Applied Econometrics, 45*(2), 211–230.

Okeke, C. C. (2017). *Input subsidies and maize yields under the GESS program*. University of Nigeria Press.

Okeke, C. C., & Umeh, J. C. (2019). Subsidies and the adoption of modern farming practices. *Technological Forecasting and Social Change, 148*, Article 119135. https://doi.org/10.1016/j.techfore.2019.119135

Olayemi, J. K., & Adesina, A. A. (2020). Market intervention and food affordability in developing economies. *Food Policy, 91*, Article 101115. https://doi.org/10.1016/j.foodpol.2020.101115

Orden, D., & Zulauf, C. (2020). *The US farm bill: A historical perspective*. American Enterprise Institute.

Reuters. (2025, April 10). Fuel subsidy removal and logistics costs in Nigeria. *Reuters*. https://www.reuters.com/

SBM Intelligence. (2024). *Jollof index: Tracking the cost of a basic meal in Nigeria*. SBM Intelligence.

Sen, A. (2017). *Collective choice and social welfare*. Harvard University Press.

Stiglitz, J. E. (1989). Markets, market failures, and development. *The American Economic Review, 79*(2), 197–203.

Stiglitz, J. E. (2020). *People, power and profits: Progressive capitalism for an age of discontent*. W.W. Norton & Company.

Sumner, D. A. (2019). *Agricultural subsidies and environmental degradation*. Oxford Research Encyclopedia of Environmental Science.

Swinnen, J., & Knops, L. (2019). The financial burden of agricultural subsidies on governments. *European Review of Agricultural Economics*.

Takeshima, H., & Edeh, H. O. (2020). *The impact of the Growth Enhancement Support Scheme (GESS) on Nigerian agriculture*. International Food Policy Research Institute.

Umeh, C. A., & Adejo, P. E. (2023). Public interest and the rationale for agricultural subsidies. *Journal of Public Affairs, 23*(1), e2450. https://doi.org/10.1002/pa.2450

United States Agency for International Development. (2024). *Insecurity and food logistics in Northern Nigeria*. USAID.

World Bank. (2021). *Poverty and shared prosperity 2021: Reversals of fortune*. World Bank.

World Bank. (2024). *Nigeria development update, June 2024*. World Bank.

World Trade Organization. (2020). *World trade report 2020: Government policies to promote innovation in the digital age*. World Trade Organization.

Yusuf, A., & Bello, M. (2022). Aligning subsidies with farmers' needs for maximum impact. *Agricultural Systems, 195*, 103–112.

Yusuf, A., Bello, M., & Shehu, A. (2022). The relationship between fertilizer subsidy reductions and retail food prices in Northern Nigeria. *Journal of Agricultural Economics, 73*(1), 234–250.