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Impact of Investment in Agriculture on Economic Growth in Nigeria

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Abstract
This research analyzed the impact of investment in agriculture on economic growth in Nigeria from 1981 to 2021. Using secondary data from the National Bureau of Statistics, the autoregressive distributive lag (ARDL) model was adopted for data analysis. The results show a long-run relationship among the variables, with crop productivity being a substantial predictor of investment in agriculture. Livestock exhibited a negative connection. The research also employed the error correction version of ARDL to examine the pace of adjustment from short-run disequilibrium to long-run stability. The report suggests supporting agricultural sector growth by encouraging investment in crop and fisheries production, minimizing food import dependency for food security, and prioritizing long-term strategies for sustainable economic growth.
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JEL Classification Codes: E31, O11, 047, O55, Q10

1. Introduction

Investments in agriculture are a significant engine of global economic growth, with wide-ranging repercussions on numerous dimensions of economic success. The agricultural sector bears tremendous significance as it provides a basic supply of food and raw materials for industries while also generating job opportunities for a considerable section of the population. By diverting resources into agriculture, economies may see tremendous beneficial impacts that reach well beyond the industry Teimaa and Elghaweet (2023). Investing in agriculture is a smart and effective strategy for attaining fair and sustainable economic growth. Such investments have a transformative impact, enhancing food security, reducing hunger, generating income, alleviating poverty, fostering rural development, addressing regional disparities, establishing linkages with other sectors, promoting sustainable practices, and contributing to environmental conservation. By recognizing the multidimensional advantages of agricultural investment, nations, and stakeholders can prioritize and mobilize resources towards the agricultural sector, unleashing its potential to create equitable and sustainable economic growth globally (Abdouli & Ouni (2023).

2. Literature Review

2.1 Conceptual Clarification

2.1.1 Concept of Investment

Investment is the act of utilizing personal assets or resources for projected positive outcomes. It is independent of saving and could have multiple effects for individuals. Essentially, investment implies giving up present resources, such as time, money, and effort, with the potential of obtaining more resources in the future (Ulanchuk, Zharun, Sokolyuk, and Tkachuk, 2017). From an economic perspective, investment refers to developing a society's capital assets. The capital stock contains things employed in the production of other products. Economic investment comprises producing new and productive capital, such as by constructing buildings and acquiring durable assets like machinery and equipment. It involves the increase of infrastructure, equipment, and inventories (Fisher, 1999).

Public investment comprises the deployment of resources by the state into assets. This can be done through national or local governments, publicly owned industries, or enterprises. Public investment usually emerges from the need to deliver vital items, infrastructure, or services that are considered crucial to national interests. With industrialization and urban expansion, public investment surged to foster community growth. In recent times, the privatization of state firms and market deregulation have led to an increase in public spending on products and services offered by the private and nonprofit sectors, typically through public-private partnerships (Fisher & Evrard, 1999).

Investing in agriculture is crucial for fostering the growth and advancement of the sector. It enables farmers to access the necessary resources to adopt innovative technologies, enhance productivity, and meet the ever-growing global demand for agricultural products. Moreover, agricultural investment contributes to rural development, job creation, and overall economic growth.

2.1.2 Concept of Agriculture Investment

Investment in agriculture is largely acknowledged as crucial for promoting economic growth, alleviating poverty, and boosting food and nutrition security. Various formulas have been devised to determine the amount of investment necessary in agriculture to achieve productivity and food security requirements. However, until now, no source has attempted to present a thorough estimate of the entire public and private investment committed to agriculture (Mollett 1986).

Investments in agriculture may be public or private, international, or indigenous. In low- and middle-income economies, most domestic investors in agriculture are farmers themselves. They are the main source of investment in this business. Following are domestic public investors, often national governments, who contribute heavily to agricultural investment. public investors, including Development partners and foreign private investors, like corporations, also make contributions to agricultural investment, albeit on a lower scale. These numerous investors, whether public or private, domestic, or foreign, disperse their money to different industries and for different reasons. Their investments often complement one another and occasionally overlap, but they usually cannot be exchanged for another. Government investments, for instance, generally target agriculture and strive to enhance primary output in sectors such as cereals, cattle, aquaculture, and forestry, as well as in associated upstream and downstream industries (Hallam, 2019).

2.1.3 Concept of Crop Production

Crop production is a regularly performed agricultural activity used by farmers globally to produce and harvest crops for food and fiber. This procedure covers numerous activities, such as preparing the soil, sowing seeds, irrigation, adding fertilizers, pesticides, and manure, preserving crops from pests and diseases, harvesting, and storage. A crop refers to a plant that is actively grown and harvested for profit or nutrition. When plants of the same species are farmed on a big scale in each region, it is referred to as a crop. Agriculture and hydroponics are the major ways employed for growing crops. Crops can also include macroscopic fungi (e.g., mushrooms) and marine macroalgae (e.g., seaweed), some of which are farmed through aquaculture. Most crops are harvested as food for human consumption or as fodder for livestock. Some crops are harvested from the wild utilizing rigorous collecting processes.

Additionally, there are non-food crops, including horticulture, floriculture, and industrial crops. Horticulture crops contain plants needed for other crops, such as fruit trees (Yunus & Effendy, 2019). The cultivation of crops is intrinsically related to economic growth through its direct contribution to GDP, employment generation, export earnings, value chain development, innovation, rural development, food security, and investment opportunities. Policies and practices that promote sustainable and efficient agricultural production play a vital role in boosting overall economic growth (Neermarga, 2022).

2.1.4 Concept of Livestock

Ranch animals continue to play vital roles in the source of revenue of people in developing countries, ranging from providing families with high-quality diets, good nutrition, and steady earnings to providing laborers with jobs, community members with social status, and farmers and herders with ways to sustain food production. Food Increasing livestock's contribution to the enterprises of rising communities needs improved awareness of livestock's myriad and intricate tasks. The contribution of food of animal origin to the nutritional condition of the world population is well proven (Ashley *et al.*, 2018). In addition to their vital role in food production and nutrition, animals also carry significant social responsibilities. They contribute to the social status of their owners and help promote gender balance by enabling women and children to acquire livestock, particularly smaller animals (Bahlo & Dahlhaus, 2021). In regions with challenging climatic conditions and marginal environments, livestock serves to mitigate the risks associated with crop failure and offers a diversification option for resource-constrained small-scale farmers and their communities (Barrett, (2022).

Livestock constitutes domesticated creatures cared for by humans, serving various purposes like agriculture, companionship, and commerce. Spanning millennia, animals have held a notable role in agriculture and have been subject to manipulation through agricultural methodologies (Monteiro, 2021). Livestock, which includes cattle, pigs, sheep, goats, poultry, horses, and others, provides distinct services in meat, milk, eggs, wool, and leather production. Animal management encompasses feeding, breeding, and healthcare tasks. While livestock production can have favorable economic ramifications, it is necessary to balance these advantages with considerations for environmental sustainability, animal welfare, and public health. Sustainable and responsible livestock management strategies are vital for securing the long-term economic existence of the sector (Panagakis, (2023).

2.1.3 Concept of Economic Growth

Economics is entirely about making rational decisions to deal with scarcity (Han, Heshmati, and Masoomeh, 2020). The primary measure used to evaluate the effectiveness of allocating limited resources is economic growth. Individuals assess their personal incomes and the changing value of their assets, while businesses monitor their profitability and market share.

Nations, on the other hand, track a range of indicators to evaluate economic growth, including national income and productivity, among others. However, some economists argue that an assessment of a nation's economy should go beyond growth and productivity and also consider factors such as distribution, equality, and per capita income. The pursuit of economic growth has always been deeply ingrained in human culture. Even in our modern, globally interconnected society, economic development remains a dominant topic in mainstream media discussions and a central concern for individuals. Nations that achieve remarkably high growth rates are often celebrated as "growth miracles." This emphasis on economic growth has been noted (Pogosov (2015).

Economic development has been dubbed a grand story of our time (Friman 2022). Based on the idea that it leads to prosperity and is a cure for any social ailment, it has been the shared aim of policy across the political spectrum and across much of the world over the previous decades (Schmelzer 2015). Increasing economic production, the concept of economic growth, is quantified as a rise in gross domestic product (GDP). However, rising GDP is associated with utilizing more resources, and increasing the pressures imposed on the environment, and there is an accumulating body of research that underlines that growth is neither a panacea nor automatically linked to prosperity (Schmelzer 2015).

2.2 Theoretical Review

2.2.1 Theory of Agrarian Society

An early, and still relevant, theory of development for impoverished, agricultural civilizations was presented by Lewis (1954). Proposed a theory of development for poor agrarian nations, emphasizing the need to amass capital for a more productive industrial sector. He maintained that low agricultural productivity demanded labor removal from agriculture, which could be done without severely harming food output. This led to the concept of taxing agriculture to support modernization, considering its significance as the major source of jobs and productivity in impoverished nations. Protectionist policies were also urged to support indigenous production. However, Johnston and Mellor (1966) opposed the perception of agriculture as stationary, noting the potential for investments in new agricultural methods to boost productivity and provide economic advantages. They felt that boosting agricultural production might alleviate the food crisis, promote exports, and contribute to manufacturing and market formation. This will ultimately help economic growth.

2.2.2 Solow-Swan Theory of Growth

Solow-Swan (1951) is a neoclassical growth theory that seeks to explain the growth of the economy over time by including factors such as capital accumulation, technical innovation, and population increase. It states that the amount of output in an economy is governed by the quantity of physical capital available, and when an economy invests in raising its capital stock, it enjoys economic growth. Technological progress, which encompasses advances in knowledge, innovation, and production, acts as fundamental catalyst for economic growth often depicted as a component that boosts total factor productivity (TFP). The model knows that population expansion aids economic advancement, but it also realizes that the advantages of population growth decline over time. Moreover, the model reveals that there is an optimal barrier of capital accumulation beyond which further investment provides falling returns. The Solow-Swan model argues that long-term economic development is driven by capital accumulation and technical advancements, explaining variations in living standards and economic performance among nations and offering important insights into economic growth drivers.

The primary equation in the Solow-Swan model is the production function, which depicts how inputs (capital and labor) are converted into output. In its fundamental form, the production function is expressed as:

$Y = f(K, AL)$---------------------------- -----------------------------------(1)

Where:

Y represents the total output or GDP of the economy,

K denotes the stock of physical capital,

A represents total factor productivity (TFP) or technological progress,

L represents the labor force, and

The production function typically anticipates declining marginal returns to capital, implying that the additional production gained from each new unit of capital reduces.

The Solow-Swan model also includes equations for capital accumulation and population growth. The equation for capital accumulation is:

$\Delta K = sY - \delta K$---(2)

Where:

ΔK represents the change in the stock of capital, s signifies the savings rate, which represents the portion of output saved and invested, δ represents the depreciation rate of capital, and

Y represents total output or GDP.

The equation for population growth is often represented as:

$\Delta L = nL$ --- (3)

Where:
ΔL represents the change in labor force,
n denotes population growth rate, and
L represents labor force.

2.3 Empirical Review

Korgbeelo (2022) conducted a study the significance of the agricultural sector in driving economic growth in Nigeria was examined. The research employed the Autoregressive Distributed Lag (ARDL) method, Error Correction model (ECM), and Granger causality test. Annual time-series data covering the period from 1981 to 2020 were utilized. The findings of the study revealed that agricultural production and forestry outputs make substantial contributions to the overall economic growth in Nigeria. On the other hand, the outputs of livestock and fisheries were found to have a relatively minor impact on the country's development. The Granger causality test indicated a bidirectional relationship between agricultural production output and economic development, while a unidirectional causation was observed from livestock output to economic growth. To enhance the contribution of the agricultural sector to the overall economic growth, the study proposed several measures. These included an increase in government budgetary allocation to the agricultural sector and the provision of subsidized agricultural inputs to farmers, among other recommendations.

Matandare (2022) studied the impact of Investment in agricultural on economic growth in Nigeria was investigated using the Auto-Regressive Distributed Lagged (ARDL) bounds testing technique. The study findings, based on the application of the ARDL bounds testing technique, provided evidence of a long-run equilibrium relationship between agricultural output, animal production, and economic growth. The results indicated that livestock production has a significant and positive influence on economic growth, both in the short run and the long run. On the other hand, agricultural output showed a substantial and positive impact on economic growth only in the long run. The study emphasized the need for efforts to focus on enhancing agricultural sector productivity in order to reduce reliance on food imports in Nigeria and promote growth in the agricultural sector. To improve economic growth, both in the short run and the long run, the study recommended that the Nigerian government and other key stakeholders should invest in and support livestock production. Additionally, initiatives aimed at boosting agricultural output were deemed crucial for achieving sustained economic growth.

Odetola and Eummu (2013) studied the influence of investment in agriculture sector on economic growth and the agriculture sector in Nigeria.

The research utilized the growth accounting framework and analyzed time series data spanning from 1960 to 2011. The study findings concluded that the agriculture sector has consistently and positively contributed to economic growth in Nigeria, highlighting its significant position in the economy. Furthermore, a causation test indicated that agricultural expansion Granger-causes GDP growth, demonstrating the role of agriculture in driving overall economic growth. However, no reverse link was discovered, indicating that GDP growth does not significantly influence agricultural expansion. The study also revealed the resilience of the agriculture sector, as it tended to recover faster than other sectors from disruptive events such as the civil war (1967-70) and economic crisis (1981-1985) periods. The research emphasized that the crop production subsector contributes the most to the growth of the agriculture sector. This highlights the prominence of this subsector and potentially suggests a lack of attention or investment in the other subsectors of agriculture. Therefore, the study suggests that increasing efforts in developing the livestock, fisheries, and forestry subsectors will enhance the contributions of the agriculture sector to the Nigerian economy.

3. Methodology

An ex-post facto research design was employed in this study, generally known as causal comparative research, to identify cause-and-effect connections between dependent and independent variables. This strategy is ideal for social research if altering human participant characteristics is not possible. It uses data already obtained, allowing for more efficient data collecting and processing. This approach is ideal for analyzing hypotheses involving cause and effect or correlational correlations where genuine experimental research is neither possible nor ethical. This research utilizes secondary data gathered from National Bureau of Statistics (NBS) and covers the period 1981–2021. The data comprises of annual time series data regarding major aspects associated to the inquiry.

3.1 Model Specification

Solow's model begins with the assumption that a nation's income is split between consumption and investments I(t) at each instant in time. mathematically, it can be expressed as

$$Y(t) = C(t) + I(t) \quad \text{...(4)}$$

It has also been claimed that I(t) is a function of a portion of income saved s. It may therefore be argued that consumption is proportionate to the remaining share. Thus, equation (2) becomes.

$$Y(t) = (1 - s)Y(t) + I(t) \quad \text{...(5)}$$

which gives

$$I(t) = sY(t) \qquad (6)$$

Mankiw, Romer, and Weil (1992) demonstrated that the addition of human capital in the neoclassical aggregate production function (2) helps the Solow model better suit the realities. Let's subsequently consider a standard labor augmented aggregate production function as a version of equation (2)

$$Y = F(K, H, AL) \qquad (7)$$

This function is expected to be characterized by constant returns to scale and diminishing marginal returns to effective labor (AL), physical (K), and human (H) capital, which are the sole factors of production.

Slow argued that changes in output are responsible for economic development (Solow, 1956, 1995); Mankiw, Romer, & Weil, 1992); Sachs & Warner, 1999); Dornbusch, Fischer, & Startz, 2004). The Solow Swan growth model is aimed to depict the way in which the simplest kind of economic system will alter during the process of development (Dornbusch *et al.*, 2004). Considering this, the study adopts the enhanced Solow model. Solow postulates a continuous generation of domestic agricultural output that is substitutable for economic expansion. The model offers a quantitative relationship between variables and is in the form of numerous linear equations, as indicated below.

$$Yt = \beta 0 + \beta 1Xt + \mu \qquad (8)$$

$$GDP = f(CRP, LIS, \mu) \qquad (9)$$

$$GDP = \beta o + \beta 1CRP + \beta 2LIS + \mu \qquad (10)$$

$$\Delta RGDP_t = \beta_0 + \beta_1 CRP_t + \beta_2 LIS_{t-1} + \sum_{i=1}^{p} \delta i{-}1 \Delta InRGDPt{-}1 + \sum_{i=1}^{p} \delta i{-}2 \Delta CRPt{-}1 + \sum_{i=1}^{p} \delta i{-}3 \Delta LISt{-}i + \mu_{t-1} \qquad (11)$$

4. Result and Discussion

Table 1: Descriptive Statistics

	RGDP	CRP	LIS
Mean	8473.149	7470.822	710.0477
Median	5024.540	4222.477	570.0829
Maximum	18738.41	16920.52	1240.215
Minimum	2303.510	1759.115	341.4115
Std. Dev.	5702.712	5250.367	302.9442
Skewness	0.496468	0.485045	0.577037
Kurtosis	1.687839	1.674695	1.784077
Jarque-Bera	4.625634	4.608245	4.801024
Probability	0.098982	0.099846	0.090671
Sum	347399.1	306303.7	29111.96
Sum Sq. Dev.	$1.30(10)^9$	$1.10(10)^9$	3671007.
Observations	41	41	41

Source: Author's computation with E-views 10

Table 1 shows the mean value of RGDP is 8,473.149, with a median of 5,024.540, a maximum of 18,738.41, and a minimum of 2,303.510. The standard deviation of RGDP is 5,702.712, suggesting dispersion around the mean. It has a somewhat positively skewed distribution (skewness = 0.496468) and is leptokurtic (kurtosis = 1.687839). The Jarque-Bera statistic of 4.625634 reveals a break from normalcy, but the related probability (0.098982) over 5% implies RGDP growth is normally distributed. The sum of RGDP values is 347,399.1, and the sum of squared deviations from the mean is 1.30(10)9, suggesting variability.

For CRP, the mean value is 7470.822, with a median of 4222.477, a maximum of 18,738.41, and a low of 1,759.115. Its standard deviation is 5250.367, showing more dispersion around the mean. The distribution is symmetric (skewness = 0.485045) and somewhat sharp (kurtosis = 1.674695). The Jarque-Bera statistic (4.608245) and related probability (0.099846) reflect a normal distribution. The sum of CRP values is 306,303.7, while the sum of squared departures from the mean is 1.10(10)9, suggesting variability. Regarding LIS, the mean value is 710.0477, with a median of 570.0829, a maximum of 1,240.215, and a low of 341.4115. Its standard deviation is 302.9442, showing variability. The distribution is symmetric (skewness = 0.577037) with moderate sharpness (kurtosis = 1.784077). The Jarque-Bera statistic (4.801024) and related probability (0.090671) reflect a normal distribution. The sum of LIS values is 29,111.96, while the sum of squared deviations from the mean is 3,671,007, exhibiting variability. While all three variables indicate variability around their means, RGDP and CRP appear to have normally distributed values, but LIS marginally departs from normality despite passing the statistical requirements.

4.2 Table 2: Unit Root Test Result

		Unit Root at Levels			Remarks	Unit Root at First Difference				
Var.	Calculated t-Statistic	Critical value	p-values	Order of Integration		Calculated t Statistic	Critical t-Values	P- values	Order of Integration	Remarks
RGDP	-0.280770	-2.936942	0.9189	I(0)	Don't Reject H_0	-6.054066	-2.9389	0.0000	I(1)	Reject H_0
LCRP	-0.400224	-2.936942	0.8995	I(0)	Don't Reject H_0	-4.197926	-2.9571	0.0000	I(1)	Reject H_0
LLIS	-0.228560	-2.936942	0.9264	I(0)	Don't Reject H_0	-4.072255	-2.9389	0.0002	I(1)	Reject H_0

Source: Author's estimation using e-views 10, 2022

From Table 2, all variables are not stationary at level but there are all stationary at first difference, as indicated by their separate p-values, which confirm the absolute t-statistic value vis-à-vis the crucial values at the 5% level of significance. The ADF test result above passed the required and sufficient requirements for utilizing Auto Regressive Distributive Lag Model (ARDL).

Table 3: ARDL Regression Results

Sele ARDL Model: ARDL (1, 1, 1, 1, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LRGDP(-1)	0.696034	0.091309	7.622834	0.0000
LCRP	0.857078	0.005202	164.7461	0.0000
LCRP(-1)	-0.591329	0.077408	-7.639106	0.0000
LLIS	0.092225	0.020391	4.522819	0.0001
LLIS(-1)	-0.099717	0.015761	-6.327000	0.0000
R-squared	0.999991			
F-statistic	410066.5			
Prob(F-statistic)	0.000000			
Durbin-Watson	2.062534			

Source: Author's computation with E-view 10, 2022

The variable reflects the lagged value of the dependent variable (RGDP) at the first lag (t-1). The coefficient of 0.696034 shows that a one-unit rise in the lagged RGDP relates to a 0.6960-unit increase in the present RGDP. The t-statistic of 7.623 reveals that the coefficient is statistically significant at a 99.99% confidence level. The variable reflects the current value of the independent variable, CRP. A one-unit rise in CRP is associated with a 0.8571-unit increase in RGDP, according to the coefficient of 0.857078. The t-statistic of 164.7461 reveals that this coefficient is extremely significant, with a p-value of 0.0000.

The variable reflects the lagged value of the independent variable CRP at the first lag (t-1). The correlation of -0.5913 shows that a one-unit rise in the lagged CRP relates to a -0.5913 unit drop in the present RGDP. Like the prior variable, this coefficient is extremely significant (p-value = 0.0000). The variable represents the current value of the independent variable, LIS. According to the coefficient of 0.092225, there is a 0.0922-unit rise in RGDP for every unit increase in LIS. The t-statistic of 4.522819 reveals that this coefficient is statistically significant at a 99.99% confidence level. This variable indicates the lagged value of the independent variable LIS at the first lag (t-1). The coefficient of -0.0997 shows that a one-unit rise in the delayed LIS is related to a -0.0997 unit drop in the current RGDP. This coefficient is similarly extremely significant (p-value = 0.0000).

Table 4: Short-run Coefficient Diagnostics

Conditional Error Correction Regression

Variable	Coefficient	t-Statistic	Prob.
D(CRP)	1.003256	296.5119	0.0000
D(CRP(-1))	-0.355690	-2.771267	0.0102
D(CRP(-2))	-0.249499	-1.754466	0.0911
D(LIV)	1.125129	11.01278	0.0000
D(LIV(-1))	-0.456256	-2.812661	0.0092
D(LIV(-2))	-0.481351	-2.720613	0.0115

Source: Author's computation with E-view 10, 2022

A one percent increase in crop output relates to an estimated rise of around 1.003256 percent units in GDP (D (RGDP)). The high t-statistic and very low p-value imply that the coefficient is highly statistically significant. One percent rise in the lagging agricultural output relates to an estimated drop of around -0.355690 units in the GDP. The negative symbol denotes a bad association. The t-statistic is significant at the 1% level. An increase in the second-leg first differential of the crop relates to an estimated drop of roughly 0.249499 units in GDP. The negative symbol denotes a bad association. The t-statistic is not highly significant, with a p-value of 0.0911. A one-unit-unit in the first differential of livestock relates to an estimated rise of about 1.125129 units in the GDP. The high t-statistic and very low p-value imply that the coefficient is highly statistically significant. A one-unit rise in the first-lagged differential of livestock is related to an estimated drop of about 0.456256 units in GDP.

The negative symbol denotes a bad association. The t-statistic is significant at the 1% level. A one-unit-unitease in the second-lag first difference of LIV is linked with an estimated reduction of about 0.481351 units in the dependent variable. The negative symbol denotes a bad association. The t-statistic is significant at the 1% level. The coefficients for D (CRP) and D (LIV) are extremely significant, demonstrating a strong short-run association with D (RGDP). The lagged initial differences of CRP and LIV (D(CRP(-1)), D(LIV(-1)), D(CRP(-2)), D(LIV(-2))) likewise demonstrate strong short-run associations. The signs of the coefficients offer information on the direction of the short-run influence.

Table 5: Long-run Coefficient Diagnostics

Variable	Coefficient	Std. Error	t-Statistic	Prob.
CROP	1.000537	0.008282	120.8115	0.0000
LIVESTOCK	1.519843	0.138259	10.99274	0.0000

Source: Author's computation with E-view 10, 2022

The long run, the coefficient is 1.000537, showing that a 1% increase in agricultural output will lead GDP to grow by 1.000537%. The standard error is 0.008282, showing the average level of uncertainty in the coefficient estimate. The t-statistic of 120.8115, which quantifies the ratio of the coefficient estimate to its standard error, A higher t-statistic shows a more substantial association between crop output and GDP in the long run. The probability value of 0.0000 shows that the coefficient estimate for crop production is statistically significant at 5%. The coefficient of 1.519843 for livestock means that a 1% increase in livestock output relates to an estimated rise of around 1.519843 units in GDP. The standard error is 0.138259, representing the average level of uncertainty in the coefficient estimate. The t-statistic is 10.99274, demonstrating a substantial link between cattle and GDP. The probability value of 0.0000 shows that the coefficient estimate for cattle is statistically significant at the 5% level of significance.

Table 6: Long-run Bounds for Co-integration Test

Test Statistic	Value	Significant	Lower Boundary I (0)	Upper Boundary I (1)
F- statistic	5.159960	0.5 %	2.56	3.49

Source: Author's computation with E-view 10, 2022

Table 4 displays the outcome of the cointegration test devised by Pesaran, Smith, and Shin (2001) when the ARDL model is provided. The test statistic (F-statistic) value of 5.159960. is larger than the pesaran crucial value of 2.56 at the 5% significance level for both the lower boundary (I (0)) and upper boundary (I (1)) and 3.49, respectively. The decision rule is to reject the null hypothesis of no cointegration when the F-statistic value is larger than the Pesaran upper boundary critical value. The study demonstrated that there is a long-term link among the factors. The long-run estimation equations for the long-run coefficients from the ARDL model Therefore, based on these results, we may infer that the F-statistic is statistically significant at the 5% level, and there is evidence of the combined relevance of the lagged variables in the ARDL model.

Table 7: Summary of the Error Correction Mechanism Result

Variable	Coefficient	Std. Error	t-Statistics	Prob.
D(LNRGD(-2))	-0.676907	0.073268	-9.238805	0.0000
CointEq(-1)*	-0.674556	0.059245	-11.38595	0.0000
R-squared	0.999992			
Adjusted R-squared	0.999983			
Durbin-Watson stat	1.800519			
Mean dependent Var	0.053497			
S.D. dependent var	0.070503			

Source: Author's computation with E-view 10, 2022

According to the study's findings, error correction in the short term has happened, since all the predicted indications are now in accord and are all significant. The D-delta sign associated with the crop showed that it only had a substantial short-run influence on economic growth. In addition, the speed of adjustment indicated by 'ECM (-1) is -0.674556, which is statistically significant at 5%, has the right negative sign, and signals a relatively high speed of adjustment to equilibrium. As mentioned in

Kidanemarim (2014), the extremely substantial error correction term further demonstrates the presence of a stable, long-run connection. It illustrates that, in the case of any temporary divergence from equilibrium among the variables, there is a 67% likelihood that they will restore to the equilibrium path within a year.

Table 8: Breusch-Godfrey Serial Correlation LM Test Result

F-Statistics	0.884402
Obs*R-squared	2.608369
Prob. F(2,24)	0.7260
Prob. Chi-Squared (2)	0.614

Source: Author's computation with E-view 10, 2022

The table displays the outcome of the Breusch-Godfrey serial correlation test. The null hypothesis of no serial connection was accepted in view of the probability value of 0.7260, which is much above 5%. The analysis revealed that the model was devoid of serial correlation and autocorrelation. The Durbin Watson statistic value of 1.747537 initially obtained in the ARDL regression likewise verified the current finding.

Table 9: Heteroskedasticity

F-statistic	0.407065
Obs*R-squared	5.582868
Scaled explained SS	4.630611
Prob. F(11,26)	0.9400
Prob. Chi-Square(11)	0.8997
Prob. Chi-Square(11)	0.9477

Source: Author's computation with E-views 10, 2022

The results of the white test, presented in Table 7, were used to assess the presence or absence of heteroscedasticity. The null hypothesis, stating that the error terms are homoscedastic, was accepted based on the probability value of 0.9400, which is higher than the significance level of 5%. Therefore, the study findings indicated that the model did not exhibit heteroscedasticity.

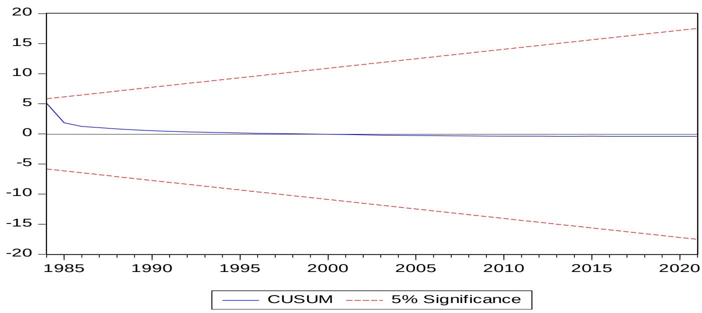

Figure 1: Cusum Test for Stability
Source: Author's computation with E-view 10, 2022

Figure 1 shows the stability of the model for this study. As indicated, it is clear from the graph that the Cusum line fell within the two 5% red lines, which suggested a stabilized model.

5. Conclusion and Recommendations

This study suggests that investment in agriculture has the potential to generate economic growth, decrease poverty, and boost food security in Nigeria. By prioritizing and supporting investment in agriculture, Nigeria can exploit its agricultural resources, enhance productivity, generate job opportunities, and diversify its economy. It is crucial for the government, private sector, and relevant stakeholders to collaborate and implement supportive policies and initiatives to unlock the full potential of agriculture for sustainable economic growth in Nigeria, especially investment in crop production and fishery production to enhance food security.

Based on the empirical evidence linking crop output and fisheries production to economic growth in Nigeria, the study put forward recommendations to enhance growth in the agricultural sector. It suggested that efforts should be focused on increasing agricultural sector productivity to reduce reliance on food imports and promote economic growth. To achieve this, the government of Nigeria and other relevant stakeholders should invest in and provide support for livestock production. Additionally, in the long run, policies aimed at improving agricultural output play a vital role in driving economic growth.

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