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IMPACT OF AGRICULTURAL FINANCING ON AGRICULTURAL PRODUCTIVITY IN NIGERIA: MODERATING EFFECT OF CORRUPTION

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Abstract
Over the years, the Nigerian government has introduced several initiatives to enhance agricultural financing, including the Agricultural Promotion Policy (APP), Anchor Borrowers Programme (ABP), Commercial Agriculture Credit Scheme (CACS), and NIRSA. However, agricultural output has not grown proportionately, largely due to corruption**.** Once a global exporter of cocoa, palm oil, and groundnuts, Nigeria now depends heavily on imports of staples such as rice and wheat. While agricultural financing is known to boost productivity, the moderating role of corruption remains less explored. This study investigates the impact of agricultural financing on agricultural productivity in Nigeria, with corruption as a moderating factor. Annual time series data from 1996–2022 were sourced from the Central Bank of Nigeria (CBN), World Development Indicators (WDI), and Transparency International (TI). The Autoregressive Distributed Lag (ARDL) model was employed to capture both short- and long-run dynamics, with structural breaks incorporated through dummy variables. Results show that government agricultural expenditure has a positive but statistically insignificant effect on productivity, while the interaction between expenditure and corruption exerts a negative and significant effect in both the short and long run. This indicates that corruption undermines the effectiveness of agricultural financing. The study recommends strengthening transparency and monitoring of agricultural spending, reinforcing anti-corruption mechanisms, and ensuring policy consistency to maximize the benefits of agricultural financing.

Keywords: Agricultural financing, Agricultural productivity, Corruption, ARDL, Nigeria

JEL Classification Codes: D73, O13, Q14, Q18,

1.0 Introduction

Agriculture has long been recognized as a cornerstone of economic development, particularly in emerging economies. Nearly every nation that has experienced sustained economic growth has also recorded significant improvements in its agricultural sector (Okuneye & Ayinde, 2011). Historically, agriculture served as the backbone of Nigeria's economy, functioning as the primary source of

food, employment, and foreign exchange earnings before the discovery of crude oil in the late 1950s (Central Bank of Nigeria [CBN], 2023). Today, the sector remains central, contributing between 22% and 26% of GDP and employing more than half of the labour force, particularly in rural areas (Food and Agriculture Organisation [FAO], 2023). Beyond its economic role, agriculture is indispensable for ensuring food security, reducing poverty, and achieving the Sustainable Development Goals (SDGs).

Despite its strategic importance, the sector continues to underperform. Agricultural productivity has stagnated, food imports remain high, and millions of Nigerians face persistent food insecurity. Several structural challenges underpin this underperformance, including inadequate infrastructure, weak land tenure systems, limited mechanization, and most critically insufficient access to finance. Financing enables farmers to acquire improved seeds, fertilizers, machinery, irrigation facilities, and storage infrastructure. Recognizing this, the Nigerian government has introduced multiple initiatives to expand agricultural financing, including the Agricultural Promotion Policy (APP), the Agricultural Transformation Agenda (ATA), the Anchor Borrowers Programme (ABP), the Commercial Agriculture Credit Scheme (CACS), and the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL). Complementary efforts have also been made through annual budgetary allocations, donor-supported projects, and microfinance interventions (CBN, 2023; FAO, 2022).

However, outcomes from these interventions have been mixed. While financing has expanded, agricultural productivity has not grown proportionately. Nigeria, once a leading global exporter of cocoa, palm oil, and groundnuts, is now a major importer of staples such as rice and wheat. This paradox—substantial financing interventions with limited productivity gains—raises critical questions about the effectiveness of agricultural financing in Nigeria.

A central factor underlying this paradox is corruption. The diversion of funds, elite capture, and weak monitoring mechanisms consistently undermine the intended impact of financing programs. In many cases, resources fail to reach smallholder farmers who constitute the majority of Nigeria's agricultural producers, while administrative inefficiencies and misallocation absorb a substantial portion of funds. As such, corruption erodes the capacity of financing to translate into tangible productivity outcomes.

The motivation behind this study is a glaring gap in the literature. The significance of financing for agricultural productivity has been emphasized by earlier research, but the way corruption moderates this link has received far

less attention. The results of current research are still inconclusive; although some studies (Samaila & Idris, 2023; Okorie & Chikwendu, 2022) amongst others show that agricultural financing has a positive impact on agricultural productivity while other studies show little or no effect (Marafa, 2024; Abubakar, Yusuf, & Abdulmalik, 2020) among others Therefore, the purpose of this research is to investigate how corruption influences the relationship between agricultural financing and agricultural productivity in Nigeria. The study intends to fill this research gap and aid in the creation of more efficient and anti-corruption agricultural funding regulations.

The rest of the paper is structured as follows: Section 2 examines pertinent literature on the topic; Section 3 describes the study's methodology; Section 4 displays the main findings and empirical results; and Section 5 offers the conclusion.

2.0 Literature Review

2.1 Conceptual Clarification

2.1.1. Agricultural Financing

The term "agricultural financing" describes financial services that span the whole value chain of agriculture. These services include short-, medium-, and long-term loans as well as other types of assistance like leasing, insurance, supply of inputs, production and distribution, wholesale, processing, and marketing of vegetables. According to Marafa (2021), it essentially entails offering a variety of financial products designed to assist both off-farm and on-farm agricultural firms and activities. Agricultural financing in Nigeria includes a range of strategies meant to support the industry. These consist of direct government spending, credit distribution via government-run organizations, and government-led programs like the Nigerian Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL), the Commercial Agriculture Credit Scheme (CACS), and the Anchor Borrowers' Program (ABP). Additionally, funding is provided by banks and other financial institutions through private sector credits and initiatives like the Youth Agricultural Revolution in Nigeria (YARN), the Micro, Small and Medium Enterprises (MSME) Development Fund, and Grow and Earn More (GEM). Furthermore, the sector relies heavily on private investors and development partners like the Department for International Development (DFID), the Food and Agriculture Organization (FAO), and the African Development Bank (AfDB) for financial resources (CBN, 2019).

Through programs, projects, and support services, the federal and state governments provide funding for agricultural development. These include investments in infrastructure, such as dams, rural roads, and storage facilities, as well as subsidies for vital farm inputs for smallholder farmers, such as fertilizer and

improved seeds, all of which are necessary to increase productivity.

2.1.2. Agricultural Productivity

Agricultural productivity is the efficiency with which agricultural inputs, such as land, labour, capital, seeds, and fertilizers, are converted into outputs, such as crops and livestock. It is typically expressed as a ratio of output to input, either using Total Factor Productivity (TFP), which takes into account a number of inputs and attributes unexplained output growth to technological advancements, or partial productivity measures, such as yield per hectare or output per labour unit (FAO, 2023; Olayemi, 2012). Agricultural productivity reflects how effectively the agricultural sector utilizes its resources to increase food supply, enhance rural incomes, and support economic growth, despite challenges like low mechanization, inadequate irrigation, and climate variability (Adewuyi et al., 2021). Agricultural production in Nigeria is made up of four major subsectors, namely crop production, livestock, forestry, and fisheries. The contribution of each subsector to total agricultural output differs significantly, with crop production dominating the sector, while livestock, fisheries, and forestry play smaller but important roles in food supply, employment, and foreign exchange earnings.

2.1.3. Corruption

Corruption in Nigeria cuts across all sectors and remains a major obstacle to development. It has reached alarming levels, with estimates suggesting that up to 40% of public expenditure is lost to corrupt practices, amounting to over ₦10 trillion in the last two decades (Famogbiele, 2013). Transparency International's Corruption Perceptions Index (CPI) highlights the persistence of this problem: Nigeria ranked 140th out of 180 countries in 2024, with an average rank of 126.83 between 1996 and 2024, its worst being 154th in 2021 and best 52nd in 1997 (Transparency International, 2024). These figures reveal entrenched corruption and poor governance, which weaken public sector efficiency (Efanga et al., 2024). Corruption manifests in forms such as embezzlement, bribery, nepotism, and money laundering, with severe economic consequences, particularly for agriculture. Although institutions like the EFCC and policies such as the Whistle blower Policy exist, they have been inadequate. Addressing corruption requires stronger institutions, accountability, and a culture of transparency. Nigeria's poor CPI performance underscores the urgent need for collective action to combat corruption and foster sustainable national development.

2.1.4. Trend of Government Expenditure and Agricultural Output in Nigeria

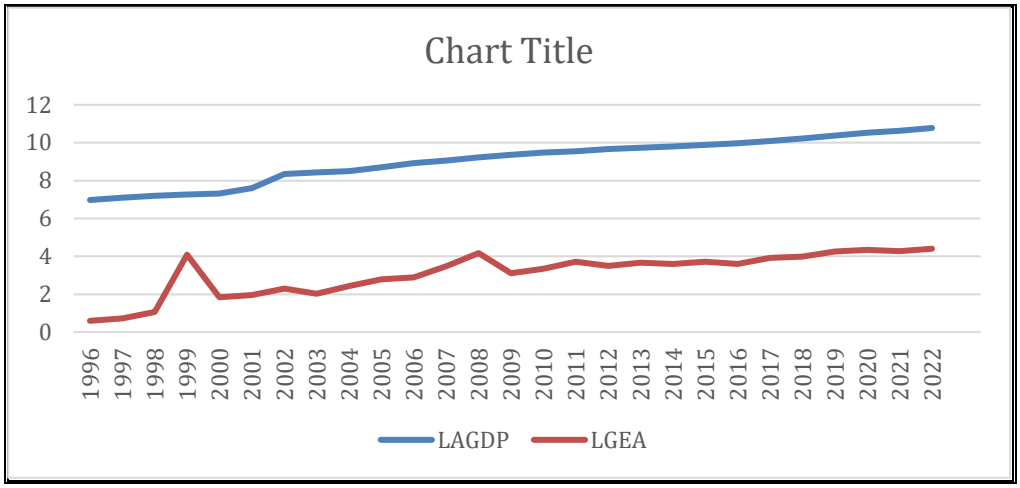


Fig 2.1. Trend Analysis of govern agricultural expenditure and agricultural output

Source: CBN, 2023

Fig 2.1 presents the trend of agricultural GDP (AGDP) and government expenditure on agriculture (GEA) in Nigeria between 1996 and 2022. The data reveal a consistent upward trend in agricultural GDP throughout the period, rising from ₦1,070.51 billion in 1996 to ₦47,944.06 billion in 2022. This reflects steady growth in the agricultural sector and highlights its resilience in contributing to national output despite structural challenges in the economy. Government expenditure on agriculture, on the other hand, exhibits a more volatile pattern. For instance, while spending stood at ₦1.82 billion in 1996, it rose sharply to ₦59.32 billion in 1999, followed by a significant drop to ₦6.34 billion in 2000. Thereafter, allocations fluctuated considerably, ranging from ₦7.54 billion in 2003 to ₦65.40 billion in 2008, before stabilizing into a gradual upward trend from 2010 onwards. By 2022, government agricultural expenditure had reached ₦81.87 billion, indicating improved fiscal commitment to the sector.

A comparative observation shows that agricultural GDP maintained a consistent growth path irrespective of fluctuations in government expenditure, particularly in the early years. However, from around 2010 onward, both agricultural GDP and government expenditure appear to rise more closely together. This suggests that government spending may have started exerting a stronger influence on agricultural performance during this period. The trend analysis indicates that while agricultural GDP has experienced steady long-term growth, government expenditure has been characterized by volatility, with stronger alignment in recent years. This underscores the importance of consistent and sustained fiscal

interventions to strengthen the link between government financing and agricultural productivity. This is how the rest of the paper is structured: Section 2 examines pertinent literature on the topic; Section 3 describes the study's methodology; Section 4 displays the main findings and empirical results; and Section 5 offers the conclusion.

2.2. Theoretical Framework

This study is anchored on two theoretical perspectives: Finance productivity theory and institutional theory. The finance productivity nexus emphasizes the positive role of finance in promoting economic growth and sectoral productivity. According to King and Levine (1993), access to finance enables firms and individuals to invest in modern technologies, expand production, and enhance efficiency. In the agricultural sector, adequate financing allows farmers to purchase improved seeds, fertilizers, mechanized equipment, and irrigation systems, which directly enhance productivity. However, when financing is constrained or mismanaged, productivity suffers. Institutional theory, as developed by North (1990), argues that the effectiveness of economic policies and financial resources depends heavily on the quality of institutions.

In environments with strong governance, rule of law, and accountability, financing translates effectively into productivity and growth. Conversely, in weak institutional settings characterized by corruption, financing may fail to deliver intended outcomes. This is particularly relevant in Nigeria, where several agricultural financing programmes have been undermined by corruption, elite capture, and political interference. This theory provides a framework for understanding the relationship between agricultural financing and productivity. While finance provides the necessary resources for production, institutional quality determines whether those resources are used efficiently. Thus, corruption is expected to moderate the financing–productivity nexus in Nigeria.

2.3. Empirical Review

Several empirical studies have investigated the nexus between agricultural financing and agricultural productivity in Nigeria, though the findings remain mixed.

Efanga et al. (2024) used ARDL analysis on secondary data from Transparency International, the World Bank, and the Central Bank of Nigeria (CBN) to investigate how government spending affects agricultural output. According to their findings, government spending considerably increases agricultural output, but the relationship between funding and productivity is moderated by the Corruption Perception Index. This demonstrates how corruption is a major element compromising the efficacy of financial solutions

Similarly, Samaila and Idris (2023) used annual time series data to evaluate the impact of agricultural funding on output growth. By using Granger causality, ARDL, and bounds testing, they discovered that government spending and the Agricultural Credit Guarantee Scheme Fund (ACGSF) have a positive and significant impact on agricultural output. Commercial bank lending, however, had a minimally beneficial impact. To promote farmers' access to facilities and inputs, the report suggested lower bank credit interest rates and more oversight of financing programs.

Okorie and Chikwendu (2022) used ARDL and error correction modelling on 1981–2020 data to assess how government spending affected the production of the agriculture sector. Their results showed that both capital and recurrent expenditures positively influenced output, though only capital spending had a significant long-run impact. They suggested tighter implementation oversight in addition to larger budgetary allotments.

Oyedepo et al., (2022) looked into how government spending and bank lending affected agricultural productivity (1981–2021). They discovered that while interest rates had a detrimental impact on growth, both financing sources had a long-term positive impact on agricultural output using ARDL and Error Correction. This emphasizes how crucial accessible finance is to maintaining agricultural output.

At the firm and sectoral level, Ademola and Oduwale (2022) found, through OLS analysis of data from 2016–2020, that bank credit significantly enhanced agricultural development. Afolabi et al. (2021), using ARDL on data spanning 1981–2017, similarly observed that deposit money bank credit significantly supported agricultural growth in the long run, though ACGSF was insignificant in both the short and long run.

Obioma et al. (2021) confirmed the importance of institutional credit, finding that both ACGSF and commercial bank loans significantly enhanced agricultural performance in the long run (1987–2012) using Johansen cointegration techniques. Likewise, Danladi et al. (2021) assessed public and private financing for crop and livestock production (1981–2019). Their results showed that while both forms of financing were positive but insignificant in the short run, private financing was significant in the long run, whereas public financing remained insignificant. The study also found a negative long-term effect of interest rates on agricultural output.

Beyond output growth, other dimensions of agricultural financing have been explored. For example, Orji et al. (2021) reported that agricultural financing positively influenced both agricultural output and employment generation between 1981 and 2017. Similarly, Sulaimon (2021), applying threshold regression (1981–2019), found that the ACGSF

positively influenced real agricultural GDP, though the effect varied across threshold levels of credit.

These studies suggest a general consensus that agricultural financing whether from government spending, commercial banks, or credit schemes tends to positively influence agricultural productivity in Nigeria. However, inconsistencies emerge regarding the magnitude and significance of these effects. For example, while government capital expenditure and private credit are often found to be significant drivers of output, recurrent expenditure and commercial bank loans sometimes produce weak or negative effects. Furthermore, several studies identify high interest rates, weak monitoring, and corruption as structural impediments that dilute the effectiveness of financing. This divergence underscores the need for further investigation into the moderating role of corruption in the financing productivity relationship.

3.0 Methodology

The study used annual time series data covering the period 1996 to 2022; specifically, data on arable land, exchange rate, and inflation were obtained from the World Bank's World Development Indicators (WDI), while data on agricultural gross domestic product (AGDP), government expenditure on agriculture, and interest rate were sourced from the CBN Statistical Bulletin; data on corruption was obtained from Transparency International. This study used an ex-post facto research design, which is appropriate for analysing secondary data that are already available.

3.1 Model Specification

To examine the impact of agricultural financing on agricultural productivity considering the moderating role of corruption, the study adopted the model of Efanga et al., (2024): AP $= f$ (AF* CPI) with little modification. Efanga et al., (2024) did not include arable land, exchange rate and inflation. The functional form of the model is presented below:

Base model: AGDP $= f$ (GEA, ARLD, EXCH, INF, CRP) 3.1

Where:

AGDP= Agricultural productivity

GEA = Government expenditure on agricultural

ARLD = Arable Land

INF = Inflation

EXCH = Exchange rate

CRP = Corruption

Agricultural productivity is the dependent variable and is proxy by Agricultural contribution to Gross Domestic Product, while Government agricultural expenditure which proxy as agricultural financing is independent variable. The arable Land, exchange rate inflation and corruption as control variables. The application of these variables is based on their relevance to the study and to enable the model capture macro-economic stability. With

interaction, the model can be expressed in econometric equation as:

AGDP=f (GEA* CRP, ARLD, EXCH, INF) 3.2

Where,

GEA*CRP = Interaction between government expenditure and corruption.

The model is expressed in an econometric form as:

$$AGDPt = \lambda 0 + \lambda 1\ (GEA * CRP)\ t + \lambda 2 ARLDt + \lambda 3 EXCHt + \lambda 4 INFt + \varepsilon \quad 3.3$$

When t is the time dimension, ε represents the model's error term, $\lambda 0$ is the intercept, and $\lambda 1$ to $\lambda 4$ are the coefficients of the explanatory variables to be evaluated. The above equation's log-linear formulation is as follows:

$$lnGDPt = \lambda 0 + \lambda 1 In\ (GEA * CRP)\ t + \lambda 2 In ARLDt + \lambda 3 In EXCHt + \lambda 4 In INFt + \varepsilon t \quad 3.4$$

3.2. Estimation Techniques and Procedure

The study first of all tested for unit root being that the data collected were time series. The Augmented Dickey Fuller test was applied to ensure that the results produced are not spurious. The bounds test for cointegration was applied to test for long run relationship among the variables, while the estimation of the relationship between the Nigerian agricultural productivity and agricultural financing were examined in the short and long-term using the Auto Regressive Distribution Lag (ARDL) model created by Pesaran and Shin (1996). In contrast to previous methods, ARDL can be used regardless of whether the underlying variables are changing at first difference, stationary at level, or both. A further benefit of ARDL is its ability to predict the model's short- and long-term parameters.

$$\Delta lnAGDP_t = \beta_0 + \beta_1 lnAGDP_{t-1} + \beta_2 \ln(GEA * CRP)_{t-1} + \beta_3 lnARLD_{\ t-1} + \beta_4 lnINF_{t-1} + \beta_5 EXCH_{t-1} + \sum_{i=0}^{z} \beta_1 \Delta InAGDP_{t-1} + \sum_{i=0}^{z} \beta_2 \Delta In(GEA * CRP)_{t-1} + \sum_{i=0}^{z} \beta_3 \Delta lnARLD_{\ t-1} + \sum_{i=0}^{z} \beta_4 \Delta INF_{t-1} + \sum_{i=0}^{z} \beta_5 \Delta EXCH_{t-1} + \varepsilon_t \quad 3.5$$

4.0 Presentation of Results and Discussion of Findings

This section presents the results of the analysis and the discussion of the findings

4.1.1 Presentation of Results

Table 4.1: Descriptive Statistics

	LAGDP	LGEA	ARLD	EXCH	INF	LCRP
Mean	9.063218	3.103614	35763222	175.3698	17.63222	3.058274
Median	9.360951	3.505557	35940000	148.8800	16.93917	3.218876
Maximum	10.77779	4.405096	36872000	425.9792	24.77083	3.367296
Minimum	6.975895	0.597957	33100000	21.88443	11.48313	2.197225
Std. Dev.	1.183560	1.124223	985619.5	109.5102	2.943181	0.360478
Skewness	-0.447152	-0.874818	-1.423617	0.825377	0.295777	-1.117971
Kurtosis	1.983163	2.699164	4.724814	2.887007	3.528391	2.807019
Count	**27**	**27**	**27**	**27**	**27**	**27**

Source: Author's Computation

The descriptive statistics in Table 4.1 summarize the characteristics of the study variables over the 27-year period. The mean value of log of agricultural GDP (LAGDP) is 9.06, with a maximum of 10.78 and a minimum of 6.98, suggesting steady but varied growth in the agricultural sector. Government expenditure on agriculture (LGEA) has an average of 3.10, with wide variation (minimum 0.60 and maximum 4.41), indicating fluctuations in funding levels over the years. Agricultural land (ARLD) shows a relatively stable pattern with a mean of 35.76 million hectares and low dispersion, reflecting the fixed nature of land resources.

The exchange rate (EXCH) has a mean of 175.37, with a sharp rise from a minimum of 21.88 to a maximum of 425.98, capturing the significant currency depreciation experienced in Nigeria. Interest rate (INT) averages 17.63%, with moderate variation, indicating a generally high-cost credit environment for agricultural financing. Corruption index (LCRP) has a mean of 3.06, ranging between 2.20 and 3.37, suggesting persistent governance challenges.

The skewness and kurtosis results indicate that most variables deviate moderately from normal distribution. For instance, LAGDP and LGEA are negatively skewed, while EXCH and INT are positively skewed. ARLD and LCRP show relatively higher kurtosis, reflecting heavier tails in their distributions. Overall, the results suggest heterogeneity across variables, with exchange rate and government expenditure exhibiting the highest.

4.1.2 Unit Roots and Structural Breaks

Table 4.2: ADF and PP Unit Root Test Results

Variables	PP				ADF				RM
	Level	**Prob.**	**First Δ**	**Prob**	**Level**	**Prob**	**First Δ**	**Prob.**	
LNAGDP	-1.3659	0.5830	-4.0331	0.5830	-1.5120	0.9632	-2.1959	0.0004	**I (1)**
LGEA	-2.5365	0.1189	-5.2393	0.1189	-0.0643	0.6944	-7.2788	0.0000	**I (1)**
LARLD	-4.0277	0.0047	-10.9749	0.0047	1.8922	0.9831	-4.6409	0.0000	**I (0)**
EXCH	1.16559	0.9970	-3.6804	0.9970	2.4599	0.9951	-2.7241	0.0086	**I (1)**
IFN	-5.7883	0.0001	-15.1687	0.0001	-1.8066	0.0679	-7.7406	0.0000	**I (0)**
LCRP	**-2.8127**	**0.0703**	**-5.9310**	**0.0703**	**1.0467**	**0.9179**	**-6.0224**	**0.000**	**I (1)**

Source: Author's computation using Eviews10

The results of the Phillips Perron and Augmented Dickey-Fuller unit root tests are shown in Table 4.2. Some of the variables are stationary at levels, while others are stationary at first difference, according to the test results. But according to the ADF and Phillips Perron tests at the 5% level of significance, every variable is stationary at first difference. As a result, the ARDL model was adopted as an analytical tool.

Table 4.3: Multiple Structural Break

Break Test	F-statistic	Critical Value**	Break Detected	Break Year
0 vs. 1 *	77.61156	8.58	Yes	**2002**
1 vs. 2 *	17.76895	10.13	Yes	**2006**
2 vs. 3 *	43.81118	11.14	Yes	**2010**
3 vs. 4 *	15.04177	11.83	Yes	**2016**
4 vs. 5	0	12.25	NO	

Source: Author's Computation

The Bai-Perron test identified four statistically significant structural breaks in 2002, 2006, 2010, and 2016, as all F-statistics exceeded the 5% critical values.

The 2002 break reflects Nigeria's early democratic reforms and the establishment of the Nigerian Agricultural Cooperative and Rural Development Bank (NACRDB), alongside poverty alleviation initiatives aimed at expanding farmer credit. The 2006 break aligns with the post-banking recapitalization era and debt relief, which increased liquidity and credit flow to agriculture. The 2010 break coincides with the aftermath of the global financial crisis and the launch of the Agricultural Transformation Agenda (ATA, 2011), marking a shift toward commercialization and value chain financing. Finally, the 2016 break corresponds to Nigeria's economic recession and the expansion of diversification programmes, notably the Anchor Borrowers Programme, which reshaped agricultural financing and credit delivery.

Overall, these breakpoints reflect key institutional, financial, and policy shifts that significantly influenced agricultural productivity in Nigeria.

4.1.3 ARDL Bounds Test for Cointegration

To ascertain the presence of a long-run equilibrium relationship among the variables, this study employed the Autoregressive Distributed Lag (ARDL) bounds testing approach**.** This technique is considered appropriate given the mixed order of integration of the variables, as it accommodates both I(0) and I(1) series without requiring pre-testing for higher orders of integration. In addition, the ARDL framework allows for the incorporation of structural break dummies**,** thereby improving the robustness and reliability of the estimated results.

Table 4.4: ARDL Bounds Test for Cointegration

Test Statistic	***Value***	**Significance**	**I (0)**	**I (1)**
F-statistic	21.7687	10%	1.75	2.87
K	6	5%	2.04	3.24
		2.5%	2.32	3.59
		1%	2.66	4.05

Note: k = number of variables; I (0) and I (1) = Lower and Upper Bounds

Source: Author's computation (2025)

Table 4.4's F-statistic result of 21.7687 rejects the null hypothesis that there is no cointegration because it is greater than the upper critical bounds for the 1%, 2.5%, 5%, and 10% significance levels. According to Pesaran et al. (2001), this demonstrates that there is a consistent long-term relationship between AGDP, GEA, ARLD, EXCH, IFN and corruption.

Table 4.5: ARDL Long run Results

Dependent Variable: LNAGDP

Variables	Coefficient	Std. Error	t-Statistic	Prob.
LGEA	0.009829	0.010713	0.917513	**0.3894**
ARLD(-1)	2.170971	0.982000	2.210764	**0.0627****
EXCH(-1)	-0.00172	0.0000504	3.40045	**0.0114****
IFN	0.001606	0.002232	0.71973	**0.4950**
LCRP	0.348898	0.122727	2.842869	**0.0249****
DUM	**0.456766**	**0.060601**	**7.537287**	**0.0001*****

Note: *** and ** = indicates 5 and 10 per cent Level of significance

Source: Author's computation (2025)

Table 4.5 showed that agricultural productivity is positively impacted by government agricultural spending (LGEA), although this effect is statistically negligible. The coefficient of 0.009829 and a p-value of 0.3894 implies that a unit increase in government expenditure increases agricultural productivity by 0.98% in the long run. Arable land has a coefficient 2.170971 and a p-value of 0.0627. This means that a unit increase in arable land increases agricultural productivity by 217% in the long run. Exchange rate (EXCH) rate has a coefficient of -0.00172 and a p-value of 0.0114. This suggests that a unit increase in exchange rate reduces agricultural productivity by 0.17% in the long run.

The result shows that inflation (INF) has a coefficient of 0.001606 and a p-value of 0.4950 which implies that a unit increase in inflation increases agricultural productivity by 0.16% in the long run. Also, corruption has a coefficient of 0.348898 and a p-value of 0.0249. This suggest that a unit increase in corruption increases productivity by 34.8% in the long run. Finally, the dummy variable (DUM) has a coefficient of 0.456766 and a p-value of 0.0001 which means that a unit increase in structural break increases agricultural productivity by 45.6% in the long run.

Table 4.6: ARDL Short run Results

Dependent Variable: D(LNAGDP)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
D (LNAGDP (-1))	-0.18276	0.074157	-2.4645	0.0432
D(LNGEA)	0.09829	0.004595	2.139076	0.0697
D(LARDL)	-2.89007	0.385078	-7.50516	0.0001***
D(EXCH-1)	0.00208	0.000212	-9.82838	0.0000***
D(INF)	0.001606	0.000886	1.813488	0.1126
D(LCRP)	0.348898	0.034612	10.08027	0.0000***
Coint Eq (-1)	-0.27864	0.016563	-16.8224	0.0000***
DUM	0.456766	0.016732	4.509856	0.0000***
R-squared = 0.995059; Adjusted R-squared = 0.990877; Durbin-Watson stat = 2.980561				
Note: *** and ** = indicates 5 and 10 per cent Level of significance				

Source: Author's computation (2025)

Government agricultural spending (LGEA) has a limited short-term impact on productivity, with a coefficient of 0.09829 and p-value of 0.0697 suggesting that a unit increase in government agricultural expenditure increases agricultural productivity by 9.82% in the short run. Arable land (LARDL) has a significant negative impact with a coefficient of -2.89007 and a p-value of 0.001 which implies that a unit increases in arable land reduces agricultural productivity by 289% in the short run. The exchange rate (EXCH) has a coefficient of 0.00208 and p-value of 0.000 means that a unit increase in exchange rate increases agricultural productivity by 0.20% in the short run. inflation (INF) has a coefficient of 0.001606 and a p-value of 0.1126. This suggest that a unit increase in inflation increase agricultural productivity by 0.16% in the short run. Corruption (LCRP) has a coefficient of 0.348898 and a p-value of 0.0000 which suggest that a unit increase in corruption increases agricultural productivity by 34.88% in the short run. With an annual correction rate of roughly 27.8% of the disequilibrium, the error correction term (CointEq-1) is negative and quite substantial. The structural break dummy (DUM), which shows how reforms increase productivity, is positive and very significant. Overall, the model is strong and does not have autocorrelation problems, explaining around 99% of the variation in productivity ($R^2 = 0.9951$; Adj. $R^2 = 0.9909$).

Table 4.7: Bound Test for the Interaction of GEA and Corruption

Test Statistic	Value	Significance	I (0)	I (1)
F-statistic	19.5639	10%	2.49	3.38
K	5	5%	2.81	3.76
		2.5%	3.11	4.13
		1%	3.5	4.63

Note: k = number of variables; I (0) and I (1) = Lower and Upper Bounds

Source: Author's computation (2025)

The F-bounds test for cointegration results presented in Table 4.7 show that the F-statistic of 19.5639 exceeds the critical values for both I (0) and I (1) at all significance levels (10%, 5%, 2.5%, and 1%). Specifically, the F-statistic is greater than I (1) bound of 3.38, 3.24, 3.76, and 4.63 at the respective significance levels. Therefore, we can reject the null hypothesis of no long run relationship and conclude there is evidence of cointegration between the variables in the long run.

Table 4.8: Result of Long run Coefficients on the interaction Between GEA and CRP

Variables	Coefficient	Std. Error	t-Statistic	Prob.
AGDP	0.266156	0.085197	3.124004	0.0141**
GEA_CRP (1)	-0.037755	0.005158	-7.319313	0.0001***
ARLD	-4.23504	1.284007	-3.2983	0.0109**
EXCH (-1)	-0.00247	0.000478	-5.16117	0.0009***
INF	0.006451	0.001822	3.540805	0.0076 ***
DUM 0.72095	0.042683 16.89095 0.0000			

Note: *** and ** = indicates 5 and 10 per cent Level of significance

Source: Author's computation using EViews 10

The interaction between Corruption and government spending on agriculture have a negative and significant effects on agricultural productivity with a coefficient of -0.037755 and a p-value of 0.0001. This indicates that a unit increase in the moderating effect of corruption reduced productivity by roughly 3.8% in the long run. The result also shows that arable land has negative and substantial impact on productivity with a coefficient -4.423504 and a p-value of 0.0109 indicating that 1 unit increase in arable land reduces productivity by 423%. The result also shows that exchange rate has a negative and significant effect with the

coefficient of -0.00247 and the p –value of 0.0009. This suggest that a unit increase in exchange rate reduces productivity by 2.4 % in the long run. Also, Inflation has a coefficient of 0.006451 and p-value of 0.0076 suggesting that a unit increase in inflation increases productivity by 0.64% in the long run.

Table 4.9: Result of the Short Run Coefficient on the interaction between GEA and CRP

Variables	*Coefficient*	*Std. Error*	*t-Statistic*	*Prob.*
D(GEA_CRP)	-0.03718	0.000615	-14.2177	**0.0000*** **
D(ARLD)	-4.23504	0.481269	-8.79975	**0.0000*** **
D(EXCH-1)	-0.83604	0.294658	-2.83734	**0.0219** **
D(INF)	0.006451	0.000778	8.294862	**0.0000*** **
ECM	-0.73384	-0.47403	-15.4809	**0.0000*** **
R-squared	0.994503	Mean dependent var		**0.147128**
Adjusted R-squared	0.990577	S.D. dependent var		**0.136681**
S.E. of regression	0.013268	Akaike info criterion		**-5.506731**
Sum squared resid	0.002465	Schwarz criterion		**-4.970426**
Log likelihood	79.83414	Hannan-Quinn criteria		**-5.357983**
Durbin-Watson stat	**2.553488**			

Source: Author's computation using EViews 10

Note: *** and ** = indicates 5 and 10 per cent Level of significance

The interaction term between government agricultural expenditure and corruption (D (GEA_CRP)) is negative and statistically significant with a coefficient of -0.03718 and a p-value of 0.0000. This implies that a unit increase in the moderating role of corruption, will reduce productivity by 37% in the short run.

Arable land (DARL) exhibits a negative and highly significant effect, with a coefficient of -4.23504 and the p-value of 0.0000. This means that a unit increase in arable land reduces productivity by 423% in the short run. The exchange rate (DEXCH) is found to be negative and significant effect on agricultural productivity in the short run with a coefficient of -0.83604 and the coefficient of 0.0219. This means that a unit increase in exchange rate reduces agricultural productivity by 83% in the short run. Inflation shows a positive and significant short-run effect, with a coefficient -0.006451 and the p-value 0.000. This implies that a unit increase in inflation increases productivity by 0.64% in the short run.

The error correction term (ECM–1) is negative and highly significant, with approximately 73% of disequilibrium corrected each period, thereby confirming the existence of a stable long-run equilibrium relationship among the variables. Furthermore, the model demonstrates strong explanatory power (R^2 = 0.9945; Adj. R^2 = 0.9906), explaining more than 99% of the variation in agricultural GDP. Nonetheless, the Durbin-Watson statistic (2.55) points to potential negative serial correlation, suggesting the need for additional robustness checks to validate the reliability of the results.

4.1.4. Post Estimation Tests

Table 4.10: Residual Diagnostics Test

Test	F-statistics	Obs*R-square	Prob.	Remarks
Jaque Bera	---	---	0.623701	**Normally Distributed**
Serial Correlation	0.870476	5.622537	0.4657	**No Serial Correlation**
Heteroskedasticity	0.411455	11.28567	0.9376	**No Heteroskedasticity**
RAMSEY RESET	0.623701	0.7405	0.7405	**Model correctly specified**

Source: **Author's computation using EViews 10**

The diagnostic tests verify that the model that looks at how corruption and government agricultural spending interact to affect agricultural productivity is accurate and well-defined.

The results of the Jarque-Bera test indicate that the residuals are normally distributed (p = 0.9442 > 0.05). According to the Durbin-Watson statistic (2.55), which suggests the lack of significant autocorrelation, the Breusch-Godfrey serial correlation test (p = 0.4657 > 0.05) shows no evidence of serial correlation. Similarly, homoskedasticity—the idea that residual variance is constant across observations—is confirmed by the Breusch-Pagan test (p = 0.9376 > 0.05). This guarantees accurate hypothesis testing and standard errors. Additionally, there is no indication of functional form misspecification, according to the Ramsey RESET test (p = 0.7405 > 0.05), confirming accurate model specification.

Lastly, the model is shown to be stable over time by the CUSUM and CUSUM of Squares stability tests (Figures 4.1 and 4.2). The findings are reliable and strong since they validate that the model meets important econometric assumptions.

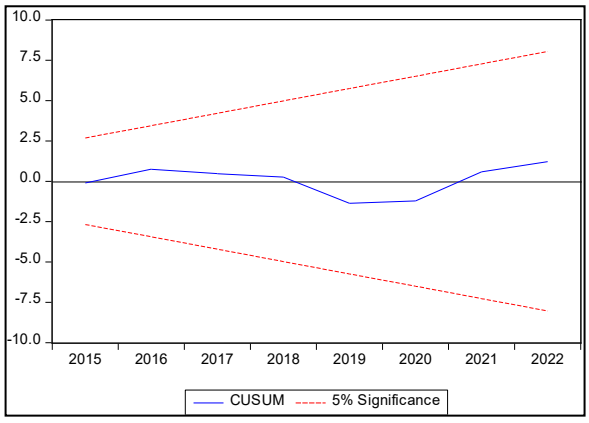


Figure 4.1: Cumulative Sum Test

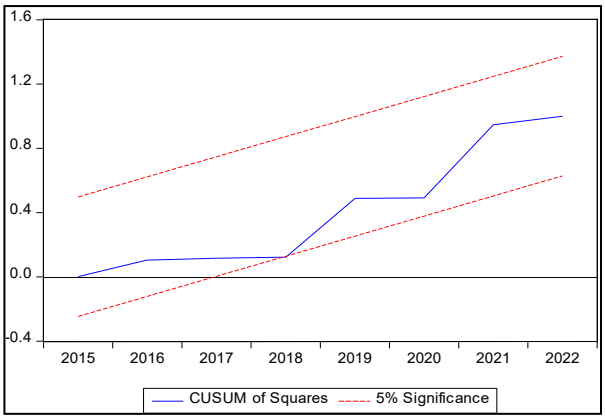


Figure 4.2: Cumulative Sum of Square

Source: Authors' Computation Using Eviews 10

4.2. Discussion of Findings

The findings reveal that government agricultural expenditure (LGEA) exerts a positive influence on agricultural productivity in both the short and long run, although the effect is statistically insignificant. This outcome aligns with prior expectations and is consistent with the results of Okorie and Chikwendu (2022), Oyedepo et al. (2022), and Okafor (2020), who reported similar relationships in their respective studies. It also corroborates the finance–productivity theory, which emphasizes the role of finance in driving economic growth and sectoral productivity. Conversely, the interaction between government agricultural expenditure and corruption exhibits a negative and significant effect in both the short and long run, in line with a priori expectations. This finding is consistent with Efanga et al. (2024), who similarly established that corruption negatively moderates the relationship between financing and agricultural productivity. It also lends support to institutional theory, which posits that financial interventions, in the absence of strong institutions and (low corruption) may not translate into productivity gains. Furthermore, the dummy variable (DUM) demonstrates a significant and positive effect, suggesting that major policy reforms or structural breaks exert a beneficial impact on agricultural productivity.

5. Conclusion and Recommendations

Utilizing annual time series data from 1996 to 2022, this study examined the relationship between agricultural financing and agricultural productivity in Nigeria, taking corruption into account as a moderating variable. A number of stability and diagnostic tests were performed in addition to the analysis, which was conducted within the ARDL framework, to confirm the robustness and dependability of the estimated results. The study shows that there is a substantial causal association between agricultural funding and agricultural productivity in Nigeria; however, the strength

of this relationship is reduced by macroeconomic conditions and corruption. This suggests that while financial interventions are essential for increasing agricultural output, sustainable productivity development requires them to be combined with institutional reforms, sound governance, and supporting macroeconomic policies.

To ensure that government agricultural financing contributes meaningfully to the agricultural sector, several key policy recommendations are essentials:

i. Government should increase its budgetary allocation to agriculture in line with the Maputo Declaration (10% of national budget) to strengthen financing.

ii. Priority should be given to capital investments (irrigation, mechanization, storage, extension services) rather than recurrent expenditures, which often have little impact on productivity.

iii. Anti-corruption measures must be integrated into agricultural financing policies. Agencies such as EFCC and ICPC should collaborate with the Ministry of Agriculture and the Central Bank of Nigeria to track fund utilization.

iv. Strong legal and institutional frameworks should be enforced to sanction corrupt practices in agricultural project implementation. This will go a long way in reducing the rate of corruption in the sector hence ensuring efficient allocation of financial resources

v. Since causality exists in the long run, agricultural financing policies should be designed with a long-term perspective to ensure stability and sustainability.

vi. Because of the presence of the multiple structural breaks found in the series, government should minimize frequent policy reversals and ensure continuity of agricultural programs across administrations to reduce disruptions caused by structural breaks.

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