



## Government Funding and Agricultural Sector Output in Nigeria: The Moderating Effect of Corruption

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**Abstract:** this study was carried out to analyse the effect of government funding of agricultural sector in Nigeria on agricultural sector output in Nigeria taking into consideration the effect of corruption perception index as a moderator. This study made use of government funding to agricultural sector as the independent variable, while agricultural output was used as the dependent variable, corruption index was used as the moderating variable. Data for this study were sourced from Central Bank of Nigeria Statistical Bulletin and World Bank Developmental Indicators. The Auto Regressive Distributed Lag (ARDL) Model was employed as the estimation technique. The result of ARDL Model revealed that government expenditure on agriculture had significant effect on agricultural output in Nigeria. Lastly, Corruption perception index moderated the relationship between agricultural financing options and agricultural output in Nigeria. The authors' therefore recommended that government should fund or support intending agricultural producers through financial initiatives that would help in enhancing agricultural output in Nigeria.

**Keywords:** agricultural output, agric sector financing, government expenditure, corruption index, food security

### Introduction

A sustainable agricultural sector is responsible for provision of food for a country's increasing population; raw materials for industries; employment opportunities; and generation of foreign exchange for economic development. Agriculture is the major driving force for major countries in Sub Sahara African (SSA) countries; it stimulates sustainable rural development and enhances the living conditions of

local communities (Corral *et al.*, 2017). It contributes considerably to the growth of Gross Domestic Product, i.e., a unit change in agricultural output brought about 34.4 per cent change in GDP as at 2021 (Azam & Khan, 2021). Likewise, (Ogbuabor & Nwosu, 2017) found that agriculture contributed to GDP of countries like Argentina, 1.1per cent; China, 13per cent; Egypt, 13.5per cent; South Africa, 9per cent; the United States, 1.1per cent; and Nigeria, 26.8per cent. However, it contributes to labor force in Israel, by 3.7per cent; Egypt, 32per cent; Brazil, 32per cent; and Nigeria, 70per cent. Agricultural development is the foundation for economic growth and provides a primary means of food security, employment generation and poverty reduction for Nigerians (Olajide *et al.* 2012).

The government has brought into cognizance the importance and prospects of the agricultural sector and it is one the major sectors it seeks to develop. There are other sources of generating employment and economic growth but only a few can be compared with agriculture in its ability to reduce poverty and enhance economic growth especially at the early stages of development. For example in Zambia and Nigeria, mineral wealth has not provided a platform for wide range of employment opportunities, poverty reduction and economic growth as agriculture has been proven to have done. Without the increasing income and affordable food that a dynamic agricultural sector provides, economic transformation will be slow and economies will remain trapped in a cycle of low growth and poverty (Department for International Development, 2005). It is a known fact that for the successful development of any sector, adequate financing is essential. Credit therefore plays an essential role in the development of the agricultural sector of economy. The agricultural sector depends more on credit as a source of finance compared to any other sector in the economy due to the lack of adequate and substantial funding of farmers and a changing trend from subsistence to commercial farming (Abedullah *et al.*, 2009). The provision of suitable financial policies and enabling institutional finance for both subsistence and commercial agriculture has prospects of enhancing agricultural development, hence, increasing the contribution of the sector in the generation of employment, foreign exchange earnings and increasing the income of economic agents engaged in agricultural practices (Olomola, 2010). Agriculture in Nigeria is dominated by small scale farmers and it is largely subsistent with low production capacity, stagnancy and over 90 percent of agricultural output is accounted for by farmers with less than two hectares of land available for crop production (Federal Ministry of Agriculture and Rural Development, 2008).

Many of the policies have been ineffective either because of poor management or macroeconomic policies affecting exchange rates, inflation and cost of capital has drowned its impact.

Having realized the declining role of agriculture to economic development, which resulted to increase in poverty rate, government over the years has put in place certain policy measures and programmes with a view of increasing the growth and development of agriculture which will in turn bring about enhanced agricultural output and food security in Nigeria. However, an evaluation of federal government capital expenditure on agriculture compared to the total federal government capital expenditure on other sector suggest that agricultural sector needs more funding. From 1980 to 2011, the federal government capital expenditure on agriculture was below 10 per cent except in the following years; 1981, 1982, 1983 (the highest), 1985, 1986, 2001, 2002, 2004, 2005, 2007, 2008 and 2009 because these were the years that coincided with the years after different government agricultural development policies and programmes such as the Green Revolution in 1980, the structural adjustment programme (1986), the Directorate of Foods, Roads and Rural Infrastructure (1987), food for all programme in 1987, the better life for rural women programme also in 1987, and the Rural Agro-Industrial Development Scheme in 1987. Others include; Agricultural credit guarantee scheme fund (ACGSF) which have features such as the self-help group linkage banking, trust fund model and interest draw back. Other schemes include; the Agricultural Credit Support Scheme (ACSS), Commercial Agriculture Credit Scheme (CACS. Under the previous administration of President Muhammadu Buhari, budgetary allocation for agriculture rose from 1.8 per cent in 2017 to 2.0 per cent in 2018, then fell to 1.56 per cent in 2019 and 1.34 per cent in 2020 before recording a slight increase in 2021. In 2022, the government have budgeted 1.8 per cent of annual budget to agricultural sector. But this is still way short of the 10 per cent yearly budget allocation proposed by African Union Maputo Declaration (AUMD) of 2003.

Another issue is the problem of corruption. In Nigeria, corruption in the public sector is endemic and this could also affect the effective and efficient channeling of funding meant to agricultural sector in Nigeria. This begs the question if agriculture is adequately financed in Nigeria and to what extent to which this finance impacts on agricultural output and food security in Nigeria. Consequently, there is a need to undertake a study on this note to provide clear perspectives on the impact of agricultural sector financing on agricultural output and food security in Nigeria.

## **Objective of the Study**

The objective of this study is to holistically examine the moderating role of corruption perception index on the relationship between agriculture sector financing options and agricultural sector contributions to gross domestic product in Nigeria.

## **Theoretical Framework**

### ***Structural change Theory***

The study is anchored on the Structural Change Theory. This theory was developed by Lewis Arthur in 1954. The Structural Change Theory as analysed and modernized by (Agbenyo, 2020) in a study, “the structural change theory – an analysis of success and failures of technology”, called it “development with unlimited supply of labour”. The assumption of this theory is that an economy is made up of two sectors. One is the traditional (agricultural or subsistence) sector while the other is the modern (capitalist, industrial or manufacturing) sector. This gave rise to the two-sector model. The theory also assumed that the development of an economy is dependent on the growth of the two sectors. This is depicted in the formula:  $Y = f(\text{AGRIC OUTPUT}, \text{IND})$ , Where;  $Y$  = Economic development,  $\text{AGRIC}$  = Agricultural sector output and  $\text{IND}$  = Industrial sector. The agricultural sector and the industrial sector are interrelated. The agricultural sector employs capital inputs, labour expertise and also is final consumer of the output of the industrial sector, while the industrial sector employs labour and output of the agricultural sector. This theory is important to this study because agricultural development cannot be possible without proper funding. The proper funding of agriculture is made possible through proper funding of agricultural schemes; the proper funding of these schemes will lead to increase in agricultural output and food security which will, in turn, lead to economic development which will invariably lead to agricultural output and food security.

### ***Conceptual Documentations***

#### ***Concept of Agricultural Output***

Agricultural output relates to the value of production or yield of a specific farming enterprise used or sold by the farm. It is simply the sum of the yield of crop production, livestock, fishing forestry and other agricultural products (Muftaudeen & Abdullahi, 2014). (Francis, 2013) averred that cash crops are crops which are grown for sales at

a profit. It includes cotton, oil palm, fruit trees, rubber, sugarcane, cocoa, coffee, etc. They are majorly produced in the southern and western parts of Nigeria. Food crops are agricultural products produced for use as food either for sale commercially or for use by the grower. It includes cereals, legumes, vegetables, tubers, fruits, etc. They are majorly produced in every region of the country. Livestock is domesticated animals raised in agricultural settings to produce labour and commodities. It includes cattle, horses, sheep, goats, camels, poultry and others; they are used in the production of meat, eggs, milk, fur, leather, jewelry and wool (see Obasi, 2015). Fisheries are the science of producing fish and other aquatic resources for the purpose of producing food for man. Examples are marine fish, moon fish, catfish, white shark, mormyridae, Atlantic cod, pupfish and lots more. Forestry is the science, art and practice of understanding, managing and using wisely the natural resources associated with and derived from forest lands (Obilor, 2013). These resources include timber, water, fish, wildlife, soil, plants and recreation.

### ***Concept of Government Expenditure in Nigeria***

The agricultural sector is an important sector of the Nigerian economy, providing employment and livelihoods for millions of Nigerians and contributing significantly to the country's Gross Domestic Product (GDP). The federal government of Nigeria has recognized the importance of the agricultural sector and has made significant investments in the sector over the years. The federal government's expenditure on the agricultural sector in Nigeria includes various programs and initiatives aimed at promoting agricultural development, improving food security, and increasing farmers' incomes. Some of the key areas of expenditure include:

**Agricultural research and extension services:** The federal government has invested in research and extension services aimed at improving agricultural productivity, promoting the adoption of new technologies, and enhancing the capacity of farmers to produce more efficiently.

**Rural infrastructure:** The federal government has invested in rural infrastructure, including rural roads, water supply, and electricity, aimed at improving access to markets, reducing post-harvest losses, and enhancing the competitiveness of Nigerian farmers.

**Agricultural credit:** The federal government has established various agricultural credit schemes aimed at providing farmers with access to finance to enable them to invest in their farms, increase productivity, and improve their livelihoods.

**Agricultural inputs and subsidies:** The federal government has provided various agricultural inputs and subsidies, including fertilizer subsidies and seed distribution programs, aimed at increasing agricultural productivity and improving food security.

**Agricultural value chain development:** The federal government has invested in the development of agricultural value chains, including processing and marketing, aimed at increasing the value of agricultural products and improving farmers' incomes.

Federal government of Nigeria's expenditure on the agricultural sector is aimed at promoting agricultural development, improving food security, and increasing farmers' incomes. While progress has been made in some areas, challenges remain, including limited access to finance, poor infrastructure, and limited adoption of new technologies. To achieve sustainable agricultural development in Nigeria, there is a need for sustained investment and targeted interventions aimed at addressing these challenges (Agugo, 2021).

### ***Concept of Corruption Perception Index in Nigeria***

Corruption in Nigeria cuts across every facet of the society and unless something is done seriously, the country may as well be going around in circles. (Ariyo, 2006) in (Famogbiele, 2013) opined that “the level of corruption in this country had gone beyond mere corruption but leaning more on the side of insanity on the part of eminently corrupt Nigerians, and has become a major precipitator of the avoidable three development gaps experienced by the nation, especially through the endemic budget deficit. Corruption and related vices account for not less than 40per cent of public expenditure; this was estimated at a savings loss of over N10tn in the last two decades, (Famogbiele, 2013). The Corruption Perceptions Index (CPI) is an index published annually by Transparency International (TI) which ranks countries based on the perceived level of corruption in the public sector. The index uses a scale of 0 to 100, where 0 indicates a highly corrupt country and 100 indicates a country with very low levels of corruption.

Nigeria has been ranked on the CPI since 1996. In the most recent ranking in 2021, Nigeria was ranked 149th out of 180 countries, with a score of 25 out of 100. This indicates that Nigeria is perceived to be highly corrupt, and the perception of corruption in the country has not improved significantly in recent years. The low score on the CPI is a reflection of the widespread corruption that has plagued Nigeria's public sector for decades. Corruption in Nigeria takes many forms,

including embezzlement, bribery, and nepotism. It has had a detrimental effect on the country's economy and has contributed to the slow pace of development in many sectors. The Nigerian government has taken steps in recent years to address corruption, including the establishment of the Economic and Financial Crimes Commission (EFCC) and the Whistleblower Policy. However, more needs to be done to address the root causes of corruption and to strengthen institutions and systems to prevent and detect corruption. Overall, the Nigeria Corruption Perceptions Index is an important tool for measuring and tracking progress in the fight against corruption in Nigeria. The low scores are a call to action for the Nigerian government and citizens to take decisive action to address corruption and promote transparency and accountability in the public sector.

### *Agricultural Financing and Government Expenditure*

Agriculture is also financed in Nigeria by the government through annual budgetary allocations. Generally, approved expenditures for agriculture increased significantly between 2004 and 2018, but allocations fall into different episodes. 28 Overall, budgeted expenditures for agriculture increased nearly 210 percent from 8.43 billion Naira in 2004 to 182.84 billion Naira in 2018. However, the increases were not uniform over time; periods of increases and decreases succeed each other. The first phase of growth was between 2004 and 2009, when approved expenditures increased by 180 percent to 162.71 billion Naira. This was the period identified above during which government policy treated agriculture as a government-led development activity. The increasing budgets funded the numerous presidential initiatives on agriculture, including inefficient subsidies on inputs (seeds, fertilizer, agro-chemicals). Actual government spending on agriculture also rose consistently every year in this period, as discussed earlier.

Approved expenditure for agriculture plunged significantly in 2010 and 2011 by 62.8 and 25.3 percent, respectively, from the preceding year's figures. The policy reform that began in 2010 to transition from a government policy of "agriculture as a development activity" to agriculture as a private sector-led economic activity. This policy led to the redefinition of the subsidy agenda and discontinuation of government's direct procurement of agricultural inputs. The subsidy reform, in particular, was behind the massive reduction in the agriculture budget in 2010. This period also witnessed the introduction of the fiscal consolidation agenda of the federal government, especially in 2011, when the government sought to "achieve

more with less” by plugging loopholes in the financial and procurement systems that led to wasteful spending. Another contributing factor was the splitting of the Federal Ministry of Water Resources into two separate ministries in 2011 by the government. The fiscal consolidation agenda and the excising of water resources from agriculture were responsible for the further reduction in the approved expenditure for agriculture in 2011, (Michael, 2016).

The next two years witnessed an increase in 2012 to N82.78 billion and a further increase to 84.24 billion Naira in 2013. These increases were responses to the funding requirements of the new Agricultural Transformation Agenda, formally launched in mid-2011. They were also in response to political economy issues in the Nigerian budgeting system that resulted in the national assembly inflating the executive budget proposals beyond what the Ministry of Finance intended to or could fund, (Michael, 2016). The decline of the approved budget for agriculture in 2014 and 2015 was for differing reasons. The continuing program of fiscal consolidation contributed to the –22.2 percent decline in 2014. Another probable contributing factor was the conclusion of the World Bank’s First Agriculture Sector Development Policy Operation (AgDPO1) endorsed in 2013, but with the proceeds expected to flow in 2014. Federal Ministry of Agriculture and Rural Development (FMARD) had expected to draw on the funds directly, as additional extra budgetary resources to budget provisions. However, a special audit finding on the AgDPO1 revealed that it appears there was a misunderstanding of the concept of the budget support financing at the sectoral level, as FMARD had impression that the funds could be earmarked for their sole use, making them withdraw the sum of \$21,444,000.00 for their activities, which they later refunded” (Osakwe, 2017). It seems that this erroneous impression influenced the Ministry’s budget request. The further decline of 37.0 percent on the approved budget for 2015 was a fallout of the drastic decline in world oil prices, which began in mid-2014.

The massive increases in budgetary allocation since 2016 appears to be a policy response of the new government that came into power in mid-2015 to the challenge of agriculture. Anchoring the economic diversification program on agriculture was a major platform of the government’s electoral campaign. The government promised to raise agriculture to new heights. The increased allocations appear to be an effort at realizing these promises. Consequently, the government increased budgetary allocations to agriculture by 86.3 percent in 2016, despite the poor state



of government revenues. However, the government could only achieve a budget execution rate of 73.9 percent in that year. This notwithstanding, the government further raised the budget for agriculture by 77.4 percent to N136.47 billion in 2017 and 34.0 percent to N182.84 billion Naira in 2018, (Osakwe, 2017).

Here is a breakdown of the yearly trends in government expenditure on Nigeria's agricultural sector from 2003 to 2022 as reported by Nigeria Bureau of Statistics:

In 2003, the government expenditure on agriculture was N11.07 billion; In 2004, the expenditure increased to N18.22 billion; In 2005, the expenditure increased further to N24.96 billion; In 2006, the expenditure increased again to N29.27 billion; In 2007, the expenditure increased to N41.29 billion; In 2008, the expenditure increased further to N81.05 billion; In 2009, the expenditure decreased to N75.70 billion; In 2010, the expenditure increased to N101.80 billion; In 2011, the expenditure increased further to N156.90 billion; In 2012, the expenditure increased again to N176.10 billion; In 2013, the expenditure decreased to N139.35 billion; In 2014, the expenditure increased to N149.46 billion; In 2015, the expenditure decreased to N92.09 billion; In 2016, the expenditure increased to N103.79 billion; In 2017, the expenditure decreased to N92.57 billion; In 2018, the expenditure increased to N203.35 billion; In 2019, the expenditure increased further to N245.57 billion; In 2020, the expenditure decreased slightly to N222.16 billion; In 2021, the expenditure increased slightly to N240.20 billion; then N291.4 billion in 2022.

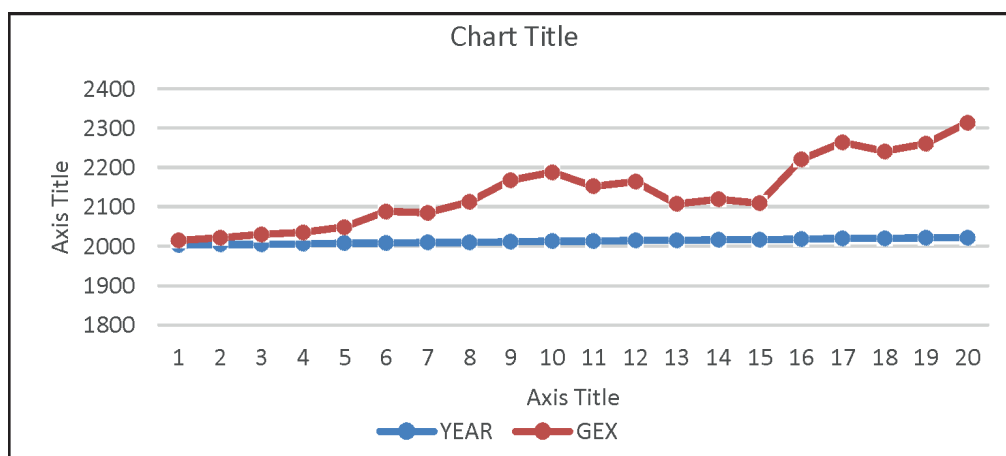


Figure 1: Trend analysis of agricultural sector contribution to GDP

From the yearly trends in figure 1, it is evident that the government's expenditure on Nigeria's agricultural sector has been inconsistent over the years, with significant fluctuations in some years. However, there has been an overall upward trend in recent years, with the government increasing its investment in the sector to improve its contribution to the country's economy (NBS, 2023).

### **Empirical Review**

Agugo, (2021) analyzed the implication of agricultural financing on rural agricultural output and food security in Nigeria. The agricultural financing indicators considered as independent variables include government expenditure on agriculture sector, commercial bank credit to agriculture sector, agriculture sector guarantee fund, lending rate. The independent variable for economic growth is considered as real gross domestic product. The study adopted ex-post facto research design. The data were sourced from central bank of Nigeria. (CBN) Statistical Bulletin and it was analyzed using multiple regression analysis. The result revealed that government expenditure to agriculture sector has positive and non-significant effect on gross domestic product in Nigeria, commercial bank credit to agricultural sector has positive and significance impact on gross domestic product in Nigeria, Agricultural sector guarantee scheme fund loan to agricultural sector has positive and significance impact on gross domestic product in Nigerian and that lending rate loan to agricultural sector has negative and significance impact on gross domestic product in Nigeria. It was recommended that government at all level should increase their allocation to the agriculture sector of the economy to enhance the profane of the sector.

Ayinde and Falola, (2021) examined the impact of agricultural credit on rural poverty reduction in Nigeria using data from smallholder farmers. The study elicited data through the use of questionnaires and used survey research design to analyse data. The dependent variable used for this study was rural poverty reduction, while the independent variable employed was agricultural credit. The results obtained in this study indicated that agricultural credit had a significant and positive impact on reducing rural poverty in Nigeria.

Azam and Khan, (2021) investigated the effectiveness of agricultural credit in reducing rural poverty in Tanzania. The dependent variable used was rural poverty perception index, while the independent variable used were agricultural credit loans, bank credit facility, government spending on agriculture and interest rates.

The results show that agricultural credit has a significant and positive impact on reducing rural poverty in Tanzania.

Adepoju, *et al.*, (2020) investigated the impact of agricultural credit on poverty reduction in Nigeria using regression analysis. The dependent variable used in the study was poverty reduction proxied by national poverty index, while the independent variable used were agricultural credit, commercial banks credit, lending rate and government expenditure. The results revealed that agricultural credit had a significant and positive impact on reducing poverty in Nigeria.

The study conducted by Asukwo, *et al.*, (2020) examined “The effect of Commercial Banks Lending on the Growth of the Agricultural Sector in Nigeria. The findings revealed that there was a significant relationship between loans and advances, interest rate and liquidity on agricultural output. Conclusively; Based on the analysis of the result, it is shown that there is a significant relationship between loans and advances and agricultural output liquidity and asset had a significant relationship on agricultural output. It is concluded that commercial bank plays a vital role in agricultural sector and they give loans to this sector of the economy in order to improve agricultural output. The study recommended that bank should make efforts to grant agricultural loans at the appropriate time. Also, recommended that the rate of lending should not be more than single digit and adequate funds should be available to commercial banks.

Tsegai, *et al.*, (2020) analyzed the impact of credit access on productivity and food security of smallholder farmers in Ethiopia using survey research design. The dependent variables used were are productivity and food security, while the independent variables were various credit access available to agricultural sector in Ethiopia. The results indicate that credit access has a positive impact on productivity and food security, which in turn can contribute to poverty reduction.

Kenny, (2019) examined the impact of agricultural sector performance on economic growth in Nigeria. The research findings revealed that there is a significant long run relationship between agricultural output and Agricultural Credit Guarantee Scheme Fund, federal government current expenditure on agriculture, total employment and trade liberalization. The VECM result indicated that 35 per cent speed of adjustment of the endogenous growth model which includes Agricultural Credit Guarantee Scheme Fund, Federal Government current expenditure, total employment and trade liberalization on agricultural domestic production implies that interventions in agriculture will take a while for its effect to be significant on agricultural output in Nigeria.

Ikpesu and Okpe, (2019) employed ARDL model in examining the effect of capital inflows and exchange rate on agricultural productivity in Nigeria from 1981 to 2016. The study used agricultural output as proxy for agricultural productivity, and private capital inflow, public capital inflow, investment, labor and real effective exchange rate as explanatory variables. The study found that the variables were co-integrated. It further indicates that in the short run and long run, private capital inflow and public capital inflow positively influenced Nigeria's agricultural performance. In addition, it was discovered that exchange rate depreciation caused a reduction in yield of agricultural produce in the short and long run.

## **Methodology**

### ***Research Design***

This study adopted the ex-post facto research design. This design is relevant for secondary data already available. Ex post facto investigation provides a solution to research problems by using data which are already in existence. Data for this study were sourced from secondary sources (Central Bank of Nigeria Statistical Bulletin, Transparency International and World Bank Development Indicators). The method of data collection for this study was the desk survey method of collecting data. It is concerned with the collection of data from existing sources to get initial ideas about research interest.

### ***Model Specification***

Based on the theoretical documentation of this study, the model showing the effect and relationship between /amongst the variables of interest were transformed into functional and econometric equations. Thus:

$$AP = f(AF) \quad (1)$$

$$AP = f(AF * CPI) \quad (2)$$

Where:

AP = Agricultural Output (proxied by agricultural gross domestic product (AGDP))

AF = Agricultural financing (proxied by government expenditure on agriculture (FGRA))

CPI = Corruption perception index

Therefore, given the models and their corresponding proxies, the econometric equations after the ordinary least square (OLS) dynamics shall be thus:

Equation one : With the moderating variable

$$\text{Log AGDP} = b_0 + b_1 \log \text{FGRA} * \text{CPI} + \text{et} \quad (3)$$

Regression constant =  $b_0$

Regression coefficient =  $b_1 - b_3$

Stochastic error term = et

Log = natural logarithm

Theoretically, it is expected that agricultural sector financing should positively impact agricultural output in Nigeria ( $b_1, b_2, b_3 > 0$ ); and negatively impact agricultural output in Nigeria when moderated by corruption perception index ( $b_1, b_2, b_3 < 0$ ) as a priori expectation, ceteris paribus.

The researcher developed the ARDL model for estimated equations as follows:

$$\Delta \text{LogAGDP}_t = \alpha_0 + \sum_{k=1}^n a_1 \Delta \text{LogFGRA} * \text{CPI}_t + p_1 \Delta \text{LogFGRA} * \text{CPI}_{t-k} + \text{et} \quad (4)$$

## Results of Data Analysis

### ARDL Model result with logAGDP as dependent variable with logCPI

**Table 1: Result of ARDL**

<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.*</i>
LOG(AGDP(-2))	0.933277	0.167528	5.570886	0.0008
LOG(FGRA(-1))*CPI(-1))	0.031171	0.009575	3.255537	0.0140
C	4.412600	0.490257	9.000577	0.0000
R-squared	0.999901	Mean dependent var		9.775461
Adjusted R-squared	0.999760	S.D. dependent var		0.595445
S.E. of regression	0.009232	Akaike info criterion		-6.254491
Sum squared resid	0.000597	Schwarz criterion		-5.710375
Log likelihood	67.29042	Hannan-Quinn criter.		-6.179465
F-statistic	7071.068	Durbin-Watson stat		2.431771
Prob(F-statistic)	0.000000			

Source: Researcher's analysis with e-views 10 output (2023)

The Auto Regressive Distributed Lag (ARDL) Model result as shown in the Table 1 presents results ARDL where the moderating variable CPI is factored into the model. The results above suggests that government expenditure on agricultural sector (FGRA) has a significant positive moderating relationship with (AGDP) in Nigeria such that a percentage increase in the moderating effect of one period lag of FGRA would bring about 3.1 percent increase in (AGDP). The result further revealed that the R-squared and Adjusted R-squared was 0.99 and 0.99 respectively. This means that the explanatory variables accounted for about 99per cent variations in the explained variable. Put differently, about 99per cent variation in agricultural gross domestic product was explained by the moderating effects of the independent variables in the model, while the remaining 1per cent may be attributed to variables not captured in the model (stochastic variables).

**Table 2: Long run form**

<i>Conditional Error Correction Regression</i>				
<i>Variable</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Prob.</i>
C	4.412600	0.490257	9.000577	0.0000
LOG(AGDP(-1))*	-0.166234	0.049818	-3.336801	0.0125
LOG(ACGSF(-1) * CPI(-1))	-0.186742	0.017955	-10.40077	0.0000
LOG(CBLA(-1) * CPI(-1))	0.030969	0.020724	1.494367	0.1787
DLOG(CPI(-1) * FGRA(-1))	-0.049054	0.015968	-3.071914	0.0180

Source: Researcher's analysis with e-views 10 output (2023)

From the moderating results of the long-run estimates in Table 2, one period lag of FGRA had a negative and significant moderating relationship with AGDP such that a percentage moderating increase in FGRA brought about approximately 5 percent decrease in AGDP in the long-run.

### **Post estimation test**

**Table 3: Test for Auto-correlation**

<i>Autocorrelation</i>	<i>Partial Correlation</i>	<i>AC</i>	<i>PAC</i>	<i>Q-Stat</i>	<i>Prob*</i>	
.** .	.** .	1	-0.309	-0.309	2.0174	0.156
.* .	.** .	2	-0.181	-0.306	2.7562	0.252
. .	.* .	3	0.014	-0.187	2.7610	0.430

. .	.** .	4	-0.047	-0.212	2.8185	0.589
.* .	.** .	5	-0.076	-0.277	2.9771	0.704
. * .	.* .	6	0.115	-0.138	3.3709	0.761
. .	.* .	7	0.044	-0.080	3.4344	0.842
. .	. .	8	-0.001	-0.024	3.4345	0.904
. .	. * .	9	0.053	0.089	3.5457	0.939
.* .	.* .	10	-0.164	-0.093	4.7529	0.907
. .	. .	11	0.048	0.010	4.8695	0.937
. .	.* .	12	-0.055	-0.122	5.0507	0.956

Source: Researcher’s analysis with e-views 10 output (2023)

This test is carried out to further test for auto correlation. The result of Correlogram Q-Statistic in Table 3 suggest that the variables are free from auto correlation.

The correlogram Q- Stat. table indicates that all p-values were >5per cent hence the conclusion that the model was free from auto correlation.

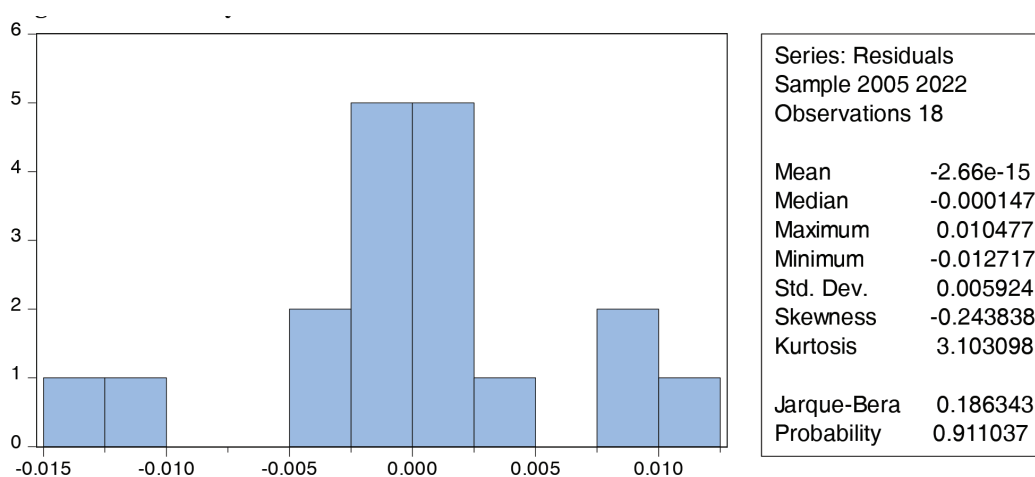


Figure 2: Normality test

Source: Researcher’s analysis with e-views 10 output (2023)

This test is conducted to ensure that the data employed in this study are normally distributed. Observing from the normality diagram in figure 5 above, as well as the Jarque-Bera statistic value of 0.186 and its corresponding p-value of approximately 91per cent in the table beside the diagram above, which is >5per cent significant level, indicates that the data are normally distributed and the error

term are normally distributed. This implies that the estimated ARDL Model is robust. This confirms the normality test as revealed by the descriptive statistics in table 3.

### *Test for serial correlation*

**Table 4: Test for Serial Correlation**

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.939221	Prob. F(2,5)	0.4505
Obs*R-squared	4.915640	Prob. Chi-Square(2)	0.0856

Source: Researcher's analysis with e-views 10 output (2023)

The Breusch-Godfrey Serial Correlation LM Test above in Table 16 above showed that the probability values of 0.4505 and 0.0856 are statistically non-significant at 5per cent level of significance. The shows that the model is free from serial correlation.

### *Test for Heteroskedasticity*

**Table 5: Heteroskedasticity test**

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	1.063352	Prob. F(10,7)	0.4825
Obs*R-squared	10.85452	Prob. Chi-Square(10)	0.3690
Scaled explained SS	1.726200	Prob. Chi-Square(10)	0.9980

Source: Researcher's analysis with e-views 10 output (2023)

The heteroskedasticity test in Table 17 above suggest that the variables are free from the problem of heteroskedasticity since the p-values of the F-stat. and Obs\*R-squared of 0.4825 and 0.0369 respectively are >5per cent significance level.

## **Conclusion**

The study evaluated the impact of government expenditure on agricultural output in Nigeria with the use of annual time series data within the period of 2003-2022. The study made use of Auto Regressive Distributed Lag (ARDL) Model ascertain the extent to which government financing influenced agricultural output in Nigeria taking into consideration the effect of corruption perception index as a moderating



variable. From the results obtained, government expenditure on agriculture had significant effect on agricultural output in Nigeria. Lastly, Corruption perception index moderated the relationship between agricultural financing options and agricultural output in Nigeria. This study concluded that there is significant effect of agricultural financing on agricultural output in Nigeria within the referenced period. This result is in congruence with the results obtained by (Udoka, Stephen and Mbat, 2016, Ahungwa, 2014, Alabi, 2014 and Adepou et. al, 2017). The results of this study however was in negation of the findings of (Dim, 2013, Ademola, 2019 and Uger, 2013).

### ***Recommendation***

Based on empirical results obtained, the researchers' therefore recommend that government should fund or support intending agricultural producers through financial initiatives that would help in enhancing agricultural output in Nigeria.

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