

Government Agricultural Expenditure and Sustainable Development Goal One in Nigeria

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Abstract: *This study investigates the impact of government expenditure on agriculture, inflation, exchange rates, and interest rates on poverty in Nigeria from 2000 to 2022, using panel regression analysis to explore the relationship between these variables and the Poverty Headcount Ratio (PHR). The findings reveal that government expenditure on agriculture has a significant positive effect on poverty levels, indicating that higher agricultural spending may inadvertently contribute to increased poverty in the country. While inflation and exchange rates do not significantly affect poverty, interest rates show a positive and significant relationship with poverty, suggesting that higher interest rates exacerbate poverty by limiting access to affordable credit. The study highlights the importance of enhancing the efficiency of agricultural spending and reducing interest rates to alleviate poverty. Additionally, it emphasizes the need for comprehensive economic policies and institutional strengthening to address the complex factors influencing poverty in Nigeria. The study contributes to the existing body of knowledge by providing new insights into the mixed effects of agricultural expenditure and the significant role of interest rates in poverty dynamics. The findings offer valuable recommendations for policymakers aiming to reduce poverty and promote sustainable development in Nigeria.*

Keywords: government expenditure, agriculture, inflation, exchange rates, interest rates, poverty headcount ratio, panel regression, Nigeria, economic policy, poverty reduction

INTRODUCTION

The agricultural sector has been recognized as one of the critical instruments for economic growth and poverty alleviation, especially in developing countries such as Nigeria. It has the potential to make a very big difference in the area of employment, food security, and the general socio-economic situation. The Food and Agriculture Organization (FAO, 2021), for instance,

indicates that agriculture investments are the best way to fight against poverty and hunger issues. Recognizing this, the Nigerian government has implemented several policies and programs to boost agricultural productivity and align with the United Nations' Sustainable Development Goal One (SDG 1), which seeks to eradicate poverty in all its forms by 2030. However, despite increased budgetary allocations to agriculture, the sector's contribution to poverty alleviation and sustainable development remains contentious.

Nigeria's agricultural sector is considered a main contributor to the country's Gross Domestic Product (GDP) and employs over 36% of the labour force (National Bureau of Statistics [NBS], 2022). However, the majority of rural people who earn their sustenance in agriculture are at the poverty level. This contradiction of the fact that farmers are the most underprivileged part of the rural population raises questions about the efficiency of government expenditure on farmers in covering the acceptable lifestyle of these people. It has been found that agriculture infrastructure, research, and skill development programs can play a huge role in low-income farmers' productivity and income levels (World Bank, 2020). Nevertheless, the truth in the Nigerian agricultural sector is characterized by the inefficiencies of the distribution and use of funds as well as the presence of fraud and limited access to necessary inputs and markets.

The issue is mainly due to a lack of connection between agricultural-industrial public spending and its effect on the poor people of the country. However, subsequent governments have thrown more money in the direction of the sector by taking actions such as the Agricultural Transformation Agenda (ATA) and the Anchor Borrowers' Program. Poor infrastructure, inadequate funding, and weak policy implementation continue to undermine the sector's potential to drive sustainable development. Furthermore, limited access to credit, mechanization, and extension services has hindered productivity, leaving many farmers trapped in subsistence agriculture.

This study aims to examine the effect of government agricultural expenditure on the attainment of Sustainable Development Goal One (SDG 1) in Nigeria. The research will be targeting the relationship of agricultural expenditure to poverty, as well as the factors that may hinder or even bleak these expenditures. The information derived from an in-depth analysis of the trends and distribution of government agricultural spending and their relationship to poverty reduction will be used to further the development of a resource allocation mechanism that is based on evidence. This kind of action will lead to real agricultural investment that will result in poverty eradication and sustainable development in Nigeria.

REVIEW OF RELATED LITERATURE

Agricultural Expenditure in Nigeria

Agriculture significantly impacts Nigeria's economy, as it accounts for about 23% (the largest share among the various sectors) of the country's GDP and employs over 36% of the entire labour force (Ogunyemi, 2020). Although agriculture occupies a dominant position in Nigeria, the sector is saddled with problems like low productivity, poor infrastructure, and lack of access to modern technology. In this context, when poverty eradication is the main concern and SDG

1 is the first and most important one, the government of Nigeria has introduced a variety of agricultural expenditure programs.

Still, these expenditures' efficacy in the pursuit of SDG 1 is a matter of doubt. In the past, Nigeria's agricultural spending has been quite low. From 2000 to 2010, agricultural spending constituted an average of 3.8% of the total government expenditure (World Bank, 2024). In 2019, the government allocated approximately ₦40 billion towards agricultural research and development, and the agriculture budget accounted for 1.8% (₦183 billion) of the overall 2020 budget, which fell far below the 10% stipulated in the Maputo Declaration (Ogunyemi, 2020). Nevertheless, the question is if the government investment in agriculture is enough to cut poverty effectively since it underfunds the sector.

It is commonly acknowledged that the main reason for the sharp reduction of poverty is enhancing agricultural productivity, both directly and indirectly through the green sector. The growing volume of agricultural production creates more job opportunities, thereby, giving people a higher nominal income and decreasing the cost of basic foodstuff, which in turn means a rise in real incomes. Some of these studies (Mendali & Gunter, 2013) listed a positive and significant effect of total factor productivity on poverty reduction in 113 developing countries. In that way, Oni has also shown that agriculture in Nigeria can be a crucial weapon in the fight against poverty, and alone 60% of the growth of per capita GDP is derived from agriculture. On the other hand, some studies make poverty measured in a non-specific way which makes it hardly used in a comparison between countries. Scientists, like Thurlow et al. (2007) and Christensen et al. (2012), believe that the factor of success in the sector is the sector's overall growth, spillover, involvement of the poor in the sector, its absolute value, and so on. However, these findings provide evidence for the multilateral and extreme nature of poverty in different regions of the world, within the scope of agricultural development.

Sustainable Development Goals

The SDGs are pragmatically working on the social, economic, health, education, and environment issues. They are redefining the development of these sectors in various years through the weakening of negative impacts on the planet. Therefore, they are a master plan for the global movement to achieve sustainability and dematerialization. Although the goals are broader, the voluntary agreements (Non-legal binding) and the action plan for sustainable development were agreed upon by 193 countries around the world. The SDGs are both a set of 17 goals and 169 targets that are not binding, a direct path toward establishing a sustainable society. Nevertheless, turning it into a vehicle for bringing about thriving sustainability is the master plan of the world by 2030 with social inclusion and common prosperity at the forefront. The SDGs, on the one hand, are the offshoots of the Millennium Development Goals, which have registered notable successes; the SDGs, however, are the continuation of the MDGs, as they encompass more areas. Therefore, the SDGs are focused on fair and equal access to rights, justice, social inclusion, and technology including the reduction of inequalities, which thus, are a comprehensive framework for global development.

Nigeria has made the Sustainable Development Goals (SDGs) their way to go for reducing poverty and, at the same time, achieving the sustainable development needed. The government already does some of the following: Millennium Development Goals (MDGs, National Economic Empowerment and Development Strategy (NEEDS), and Vision 20:2020. Thus, SDG1 aims at No Poverty, which is consistent with the strategies laid down by the country for improving the human development index. Despite the ongoing efforts, still, considerable barriers to development remain to be overcome because a very large part of the population is in chronic poverty and is suffering from very poor living conditions. These thorny issues show the importance of a more aggressive approach from Nigeria in setting the SDGs along with development priorities that are important to them.

The Brundtland Commission, defining sustainable development in 1987, refers to activities whose purpose is to ensure future generations are not starved of their needs, now and in the future, while today's needs are being met. Thus, Earth Summit and other conferences in 1992 have provided a new cornerstone of truth to this principle that features the environmental protection aspect in development policies. Schmidt-Traub (2015) highlighted the UN's efforts to operationalize the SDGs through key investment areas such as health, education, food security, infrastructure, and biodiversity. These areas underscore the multidimensional nature of sustainable development and its importance for addressing poverty globally and in Nigeria. The poverty headcount ratio is a popular economic measure that calculates the percentage of the population under the poverty line. The "middle refers to the minimum income or full-consuming possibilities that ensure the fulfilment of basic human needs such as food, housing, and clothing. It displays a map of statistics on poverty within a region and aids governments, policymakers, and international organizations in creating more specific action plans for poverty reduction to the extent of how it has affected the people in the area.

The National Bureau of Statistics (NBS) indicated that food was 40.1% of incomes for households on the national level in the 2018/2019 report. The result of this is that four out of ten Nigerians, which is roughly 83 million people, could not consume the basic expenditures of ₦137,430 (\$449.3) annually or approximately ₦376.52 (\$1.23) per day. Poverty was inflicted on rural areas more than in urban settings, as 52.1% of the rural population lived in hardships compared to only 18% of the urban population, which means a tremendous divide between them. Additionally, the above statistics were withheld by NBS's announcement of the national MPI project and the confirmation of the recent release of data from the country's Bureau of Statistics, which unveiled that over 63% of Nigerian citizens are multidimensionally poor concerning monetary poverty and quality of life.

The multidimensional perspective covers a wide range of factors, such as a lack of education, health care, overcrowded living conditions, and the absence of sanitation facilities. The report shows that multidimensional poverty is mostly characteristic of rural areas, whereas 72% of the total population, living poorly, is rural, while 42% live in urban places. The perpetually high poverty headcount ratio, a proxy of the number of poor, is mainly due to the additional infrastructure, among other things, that is restricted to a few of the citizens as well as the limited capacity of schools and healthcare facilities and notably unemployment. These situations

manifest the demand for becoming broader and more fighting poverty programs where they are and thus the agenda on feasible goals, including poverty reduction as 2030 planned – will be followed through. Thus, combating these offences becomes the integration of legal support, a fairer system, and a green economy.

Theoretical Review

The research delves into three major economic theories, namely Wagner's Law of Increasing State Activity, Keynesian Theory, and Human Capital Theory. These theories serve as the foundation for the examination of the relationship between government expenditure and Sustainable Development Goal One in Nigeria, which is specifically related to agriculture. The Wagner's Law, introduced by Adolph Wagner, stresses the fact that government spending ought to rise proportionally to the economic growth of a country (Musgrave, 1959). It points out that public expenditure is necessary in vital areas, such as agriculture, which leads to rural development and poverty reduction. Wagner argues that with economic growth, there is an increased demand for public goods and services, such as agricultural infrastructure, subsidies, and rural support systems, to ensure economic stability and equitable development (Tanzi, 1987).

Keynesian Theory, which is the name of the theory that was worked out by John Maynard Keynes, thrusts to the fore the central role of government spending which is used for the economic movement forward and the decrease of poverty especially in the agricultural sector. Keynes (1936) maintained that a government can increase its expenditure on public works during a recession and thus, the construction of agricultural infrastructure or rural credit systems can raise aggregate demand and employment. This theory is in line with Nigeria's poverty reduction goals, which call for strategic fiscal policies that give priority to agriculture. Through the allocation of funds toward the agricultural sector, for example, irrigation, mechanization, and value chain development, the government can raise efficiency, create employment, and improve food security, which addresses the country's poverty problem and will help the government realize the poverty reduction objectives (Galí, 2015).

Human Capital Theory is related to Becker (1964) and it combines the investment in education, healthcare, and workforce skills with economic growth and poverty alleviation. It underlines the fact that government spending on agricultural education, extension services, and rural healthcare increases production in rural areas. This method makes sure that the farmers get the skills and health they need for productive farm work. State assistance to research and training institutions in agriculture sets people in their capacities with new techniques that allow them the ability to raise yields and incomes (Psacharopoulos, 1994). Equally, public health programs that target rural farmers' areas of concern lower the disease burdens, permitting consistent agricultural productivity.

To sum up, the theories uniformly point out government spending in agriculture as one of the major strategies for achieving Sustainable Development Goal One in Nigeria which deals with eradicating extreme poverty. Wagner's Law explains that intensity in spending on agriculture is a result of economic growth and social demands and, hence, it is a proper way to answer to

the quality that brings a quality of life. Keynesian Economics gives countercyclical spending ideas that mean spending on agriculture is the right option in economic crises to promote employment and development. Human Capital Theory shows the impressive effects of the usage of resources in the agricultural sector and the healthcare sector through which a skilled and productive rural workforce can be secured. These theories together are an alternative way of poverty reduction focusing on agriculture in government expenditure to enable Nigeria to achieve sustainable development.

Empirical Review

Eneji et al. (2019) performed research on the effect of government expenditure on the productivity of agriculture in Nigeria (1981–2018) by concentrating on agriculture, health, infrastructure, and food imports. The OLS and ECM techniques were used by them to find out that the government expenditure on agricultural productivity has a positive but weak impact and food imports have a negative impact. The study proposed not only the increase of the budget share of agriculture but also the adoption of policy measures to boost domestic production and discourage food imports. Eze et al. (2019) studied the contribution of fiscal policy to Nigeria's real sector growth, with government capital expenditure on agriculture being the main area. According to the ARDL regression, the study showed that government capital expenditure has a positive and significant impact on agricultural sector development, which in turn causes economic development through infrastructure.

Ahmed (2019) investigated the impact of agricultural output on the standard of living in Nigeria (1970–2016). Using ECM, the study showed that the standard of living responds elastically to agricultural outputs (crops, forestry, fishery, livestock), with short-run effects being more pronounced. Jimmy and Guluwa (2021) assessed the effect of government expenditure on agricultural productivity in Nigeria (1980–2019) using ARDL. The findings revealed a significant positive impact, underscoring the need for increased agricultural funding to enhance productivity and economic growth.

Sebastian et al. (2019) examined the impacts of public spending and financial credits on agriculture on productivity in Nigeria. OLS analysis reveals a negative association between the government's agricultural program and the agricultural output while the positive influence of the bank on agricultural production and production index has been recorded. The study recommended that the government should, respectively, increase its spending and adopt strategic methods toward dealing with the resulting negative trends. Alabi and Abu (2020) studied agricultural public expenditure's impact on productivity (1981–2014) using cointegration and ECM. Findings revealed that capital expenditure positively influences productivity, while recurrent expenditure does not. The study highlighted a budget bias against capital expenditure and advocated for increased spending on irrigation to maximize benefits. Chikezie et al. (2020) evaluated the relationship between government agricultural expenditure and economic growth in Nigeria (1981–2017). Utilizing Pearson correlation and OLS, results showed significant positive correlations between growth and various forms of expenditure, including capital and recurrent, as well as agriculture loans. Dada and Fanowopo (2020) explored the nexus between economic growth and poverty in Nigeria using ARDL. Their

findings emphasized that strong institutions and sound economic policies are crucial for poverty reduction through sustained economic growth. Ali et al. (2021) examined governance, public expenditure, and trade's role in poverty reduction across Sub-Saharan Africa (1996–2019). Using PMG analysis, results highlighted the significance of governance, particularly political stability and anti-corruption measures, in enhancing public expenditure efficiency and trade for poverty alleviation.

Mostafa (2021) investigated government expenditure's relationship with economic growth in Egypt (1952–2020). Using advanced econometric models, the study found a positive unidirectional relationship, where government expenditure drives growth. As described by Marita et al. (2021), there were three indicators of development, public expenditure, and investment that affected poverty in North Sumatra (2014–2018). As far as the factors are concerned, apart from economic growth, among the determinants measured in the study, the importance of economic growth as a poverty-reducing mechanism has been greatly undermined. Zomatic (2021) investigated the effect of public expenditure on the economic growth of the country for 50 years, using a vector error correction model. The relationship was found to exist in the long run, however, there was no short-run connection as well. This indicates that non-performance of the budget is detrimental to the growth of the country. Olumba et al. (2021) examined the contribution of agricultural expenditure to the economic growth of five African countries (2001-2011) by utilizing the fixed-effects regression. Even though the relationships were significant, one of the important factors is the fact that increased agricultural spending is a bigger “driver” of the country's conditions.

Finally, the growth of Lesotho agriculture has been weighed with the same techniques such as ARDL, DOLS, and VEC Granger causality methods by Megbowon et al. (2022) from 1982 to 2019. The results show that the ongoing level of agricultural expenditure has a slight chance to stimulate economic growth, but domestic investment is a stronger factor that attracts positive economic growth. After all, policies that are merely based on agricultural expenditure to attain growth are not feasible.

Ngobeni and Muchopa (2022) studied the impact of agricultural government expenditure and other variables including rainfall, CPI, food import value, and population on agricultural production in South Africa with the help of Johansen cointegration and Granger causality tests. Findings include that there is a long-run relationship between the variables. The study found that in the long run government, agricultural expenditure does not directly cause agricultural production but interacts with other factors. Weather, Population and government spending on agriculture increased the production, while the consumer price index and food imports were the deterrents. Agbana and Ebisine (2022) assessed the impact of Nigeria's agricultural expenditure (via agricultural credit guarantee scheme fund and government spending) on economic growth (1981-2021) through OLS regression. The results show a positive and significant impact of agricultural expenditure on real GDP, with the explanatory variables accounting for 71.3% of economic growth. These findings are consistent with the studies that confirm the positive role of government agricultural expenditure in strengthening economic growth in Nigeria.

Gap in Empirical Review

Even though there have been numerous studies on government expenditure and its effect on economic growth and sectoral performance, there are still gaps in the literature. Even though researchers such as Megbowon et al. (2022) and Ngobeni and Muchopa (2022) examined the effect of government agricultural expenditure on economic growth and agricultural production, their findings are mainly centred on contexts outside Nigeria, leaving a gap in the understanding of the specific dynamics of Nigeria's agricultural sector. Besides, though studies like Agbana and Ebisine (2022) have investigated the relationship between agricultural expenditure and economic growth in Nigeria, they mainly used proxies such as agricultural credit guarantee schemes and general government agricultural expenditure, and have not sufficiently covered the broader economic environment, like inflation, exchange rates, and structural inefficiencies, that might moderate these relationships. Moreover, the mixed and conflicting findings across studies suggest that more empirical evidence is needed to establish clearer causal pathways and policy implications. The study will close these gaps by adopting advanced econometric techniques and a larger set of variables which will give a better understanding of the effect of government agricultural expenditure on economic growth in Nigeria.

METHODOLOGY

The research involved a meticulously executed ex-post-facto research design which enabled the LINK of cause and effect relationships without the researchers manipulating independent variables since these conditions had previously occurred. However, this research received information from experts in the domain, and thus it is very dependable. The research that took place in Nigeria was done to determine the impact of the government on agriculture and Sustainable Development Goal 1 which is a program directed toward the eradication of poverty. The study's data were derived from secondary sources, namely the Central Bank of Nigeria (CBN), the National Bureau of Statistics (NBS), journals, and the World Bank's World Development Indicators. This rich and multi-source set of data formed the basis for the examination of the connection between government spending on poverty alleviation in Nigeria.

Model Specification

The mathematical specification of the implicit model that expresses the effect of government expenditure on the poverty rate is expressed as:

$$PHCR = F (AGREX) \quad \text{[Equation (1)]}$$

Setting up the equation (2) in a linear stochastic form (or econometric form) is expressed as:

$$PHR_{it} = \beta_0 + \beta_1 AGREX_{it} + c_{it} + \varepsilon_{it} \quad \text{[Equation (2)]}$$

Introducing the moderating variables, we have:

$$PHR_{it} = \beta_0 + \beta_1 AGREX_{it} + \beta_2 INFRATE + \beta_3 EXRATE + \beta_4 INTRATE + c_{it} + \varepsilon_{it} \quad \text{[Equation (3)]}$$

According to Tama and Haliba (2022), the introduction of natural logs to equation (3) would be more efficient in estimating the parameters.

On the strength of these, taking the natural logs of some of the extreme explanatory variables in equation (3) results in the following equation (4):

$$\text{Log(PHR)}_{it} = \beta_0 + \beta_1 \text{Log(AGREX)}_{it} + \beta_2 \text{INFRATE} + \beta_3 \text{EXRATE} + \beta_4 \text{INTRATE} + c_{it} + \varepsilon_{it}$$

[Equation (4)]

Where;

Log	=	Natural Logarithm
PHR	=	Poverty Headcount Ratio
AGREX	=	Agriculture Expenditure
INFRATE	=	Inflation Rate
EXRATE	=	Exchange Rate
INTRATE	=	Interest Rate

β_0 is the constant term or intercept for firm i in the year t .

$\beta_1, \beta_2, \beta_3,$ and β_4 are linear regression coefficients to be estimated.

c_{it} is the non-observable individual effect while ε_{it} is the disturbance or error term for firm i in the year t .

Method of Data Analysis

The study used OLS regression analysis and a wide range of econometric techniques for data processing to make sure the results were dependable. Descriptive statistics, such as metrics like mean, standard deviation, skewness, kurtosis, and the Jarque-Bera test, were employed to both summarize and evaluate the data's distributional characteristics. A unit root test, particularly an Augmented Dickey-Fuller (ADF) test, was carried out to check that the variables were stationary before the ARDL cointegration test that investigated whether the variables had long-term relationships. Post-estimation diagnostics included the Jarque-Bera normality test, the White test for heteroscedasticity, and the Breusch-Godfrey test for autocorrelation to verify the regression assumptions. Furthermore, a specification error test (RESET) was employed to examine whether the model was misspecified, and model stability was checked to guarantee safe results. All these methods together ensured a broad and thorough analysis.

DATA ANALYSIS AND DISCUSSION

Table 4.2.1: Descriptive Statistic

	PHR	AGREX	INFRATE	EXRATE	INTRATE
Mean	41.04130	37.32331	12.73396	200.3287	17.57085
Median	41.40000	36.30453	12.55496	153.8625	16.89333
Maximum	53.40000	81.86696	21.34000	434.7000	24.77083
Minimum	30.90000	6.335779	5.388008	101.6973	11.48313
Std. Dev.	6.068373	23.79125	4.023378	103.2870	2.908416
Skewness	0.249232	0.392354	0.177308	1.118608	0.650296
Kurtosis	2.424374	2.027646	2.484453	2.876540	3.884756
Jarque-Bera	0.555652	1.496188	0.375227	4.811194	2.371235
Probability	0.757428	0.473268	0.828935	0.090212	0.305557
Sum	943.9500	858.4362	292.8811	4607.560	404.1295
Sum Sq. Dev.	810.1533	12452.52	356.1265	234700.3	186.0955
Observations	23	23	23	23	23

Source: Authors Computation, 2024 (Eviews-10)

Descriptive statistics in Table 4.2.1 give a summary of the key measures of the analysis, including the Poverty Headcount Ratio (PHR), Agriculture Expenditure (AGREX), Inflation

Rate (INFRATE), Exchange Rate (EXRATE), and the Interest Rate (INTRATE). The mean PHR value of 41.04% indicates that, on average, 41.04% of the population falls below the poverty line during the study period. AGREX has a mean value of 37.32, suggesting a moderate level of agricultural expenditure, though the large standard deviation (23.79) indicates considerable variability. The inflation rate has a relatively low mean of 12.73%, with a standard deviation of 4.02, signifying modest variation. The exchange rate shows the highest variability, with a mean of 200.33 and a standard deviation of 103.29, reflecting the fluctuations in Nigeria's currency value during the period. Interest rate variability is quite low, as the average is 17.57 and the standard deviation is 2.91.

The characteristics of the distribution of the variables are also remarkable. The terms PHR, AGREX, and INFRATE show near-normal skewness values, suggesting symmetry in the distribution, while EXRATE is positively skewed (1.12), which means that the right tail is longer. The kurtosis values for the majority of the variables are nearly the same, which indicates a normal distribution, except for INTRATE, which is slightly leptokurtic (3.88), which means a higher peak. The Jarque-Bera test of most variables proves their normality as the p-values are high (greater than 0.05) for PHR, AGREX, INFRATE, and INTRATE, thus they are normally distributed. On the other hand, EXRATE's Jarque-Bera p-value of (0.09) suggests that it may be non-normal. These statistical properties illustrate the central tendencies, the variation, and the distributional behaviour of the variables, which is of utmost importance for the upcoming econometric analysis.

Table 4.2.2: Unit Root Test Results

Variable	ADF Unit Root Test			
	t-Statistic at Levels	P-value	t-Statistic at 1 st Difference	P-value
PHR	-3.6077	0.0473	-1.8189	0.3640
AGREX	1.2872	0.9469	-9.1457	0.0000
INFRATE	-1.9853	0.0467	-4.1477	0.0002
EXRATE	3.6709	0.9998	-3.8001	0.0004
INTRATE	-0.2662	0.5833	-6.6595	0.0000

Source: Authors Computation, 2024 (Eviews-10)

Table 4.2.2 demonstrates the Augmented Dickey-Fuller (ADF) unit root test, which is being used to analyze the stationarity of the data in the research. To find out if the variables are integrated of order 0 (stationary) or order 1 (non-stationary), the test is applied both at the levels and first differences of the variables. For the Poverty Headcount Ratio (PHR), the t-statistic at levels is -3.6077 with a p-value of 0.0473, which is significant at the 5% level, thus showing that PHR is stationary at levels. Nevertheless, a t-statistic of -1.8189 and a p-value of 0.3640 are obtained at the first difference, which is a non-stationary situation. Agriculture Expenditure (AGREX) at the levels exhibits the non-stationary aspect with a t-statistic of 1.2872 and the p-value of 0.9469, and it has become stationary at the first difference, according to the t-statistic of -9.1457 and the p-value of 0.0000 which is showing that it is integrated of order 1.

Inflation Rate (INFRATE) is stationary at levels, showing a t-statistic of -1.9853 and a p-value of 0.0467. The variable becomes extremely stationary at the first difference (t-statistic of -4.1477 and p-value of 0.0002). The Exchange Rate (EXRATE) and Interest Rate (INTRATE) are both non-stationary at levels with high p-values (0.9998 and 0.5833, respectively), but they become stationary after first differencing. EXRATE has a t-statistic of -3.8001 (p-value of 0.0004) and INTRATE has a t-statistic of -6.6595 (p-value of 0.0000) at the first difference, indicating that both variables are integrated of order 1. These unit root test results suggest that while most variables are non-stationary at levels, they become stationary after first differencing, which is crucial for subsequent econometric modeling, such as cointegration analysis and the Autoregressive Distributed Lag (ARDL) model.

Table 4.2.3: Correlation Matrix Results

	PHR	AGREX	INFRATE	EXRATE	INTRATE
PHR	1.000000	-0.419913	0.298117	-0.153256	0.558521
AGREX	-0.419913	1.000000	0.182935	0.827731	-0.795192
INFRATE	0.298117	0.182935	1.000000	0.458221	0.055256
EXRATE	-0.153256	0.827731	0.458221	1.000000	-0.611397
INTRATE	0.558521	-0.795192	0.055256	-0.611397	1.000000

Source: Authors Computation, 2024 (Eviews-10)

Table 4.2.3 presents the correlation matrix for the variables in the study, providing insights into the linear relationships between them. The Poverty Headcount Ratio (PHR) shows a significant negative correlation with Agriculture Expenditure (AGREX) of -0.4199, indicating that as government expenditure on agriculture increases, the poverty level tends to decrease, though the relationship is moderate. PHR has a positive correlation with Inflation Rate (INFRATE) (0.2981) and Interest Rate (INTRATE) (0.5585), suggesting that higher inflation and interest rates are associated with higher poverty levels. A negative correlation of -0.1533 with the Exchange Rate (EXRATE) implies a weak inverse relationship between exchange rate fluctuations and poverty, though not statistically significant.

AGREX, on the other hand, has a strong positive correlation with EXRATE (0.8277), highlighting a substantial association between agricultural expenditure and exchange rate movements. However, AGREX has a strong negative correlation with INTRATE (-0.7952), suggesting that higher interest rates may discourage agricultural expenditure. The Inflation Rate (INFRATE) shows moderate positive correlations with EXRATE (0.4582) and a very weak positive correlation with INTRATE (0.0553), indicating that inflation is somewhat related to exchange rate fluctuations but has minimal relation with interest rates. Finally, EXRATE and INTRATE show a negative correlation of -0.6114, reflecting a tendency for the exchange rate and interest rates to move in opposite directions. These correlation results suggest complex interdependencies between the variables, with government spending, inflation, and exchange rates playing critical roles in influencing poverty levels in Nigeria.

Table 4.2.5: Panel Regression Analysis (Dependent Variable: PHR)

Variable	Coefficient	Standard Error	t-Stat	p-Value
AGREX	0.151911	0.064193	2.366469	0.0329
INFRATE	0.056002	0.392750	0.142589	0.8886
EXRATE	0.055593	0.040627	1.368360	0.1928
INTRATE	1.262672	0.579768	2.177889	0.0470
C	15.37577	11.65751	1.318959	0.2084
$R^2 = 0.57$, Adjusted $R^2 = 0.33$, F-Stat = 6.357404, Prob(F-stat) = 0.006768 DW = 1.74				

Source: Authors Computation, 2024 (Eviews-10)

Table 4.2.5 presents the results of the panel regression analysis where the dependent variable is the Poverty Headcount Ratio (PHR). The coefficient for Agriculture Expenditure (AGREX) is 0.1519 with a t-statistic of 2.3665 and a p-value of 0.0329, suggesting that government expenditure on agriculture has a statistically significant positive effect on poverty levels in Nigeria, with higher agricultural spending associated with an increase in poverty. The Inflation Rate (INFRATE) and Exchange Rate (EXRATE) have positive coefficients (0.0560 and 0.0556, respectively), but their p-values (0.8886 and 0.1928) are not significant, indicating that inflation and exchange rate fluctuations do not significantly affect poverty in this model.

The Interest Rate (INTRATE) shows a positive and significant relationship with poverty, with a coefficient of 1.2627, a t-statistic of 2.1779, and a p-value of 0.0470, suggesting that higher interest rates tend to exacerbate poverty levels. The constant term (C) has a positive coefficient of 15.3758 but is not statistically significant, with a p-value of 0.2084. The R-squared value of 0.57 indicates that 57% of the variation in poverty can be explained by the independent variables in the model. However, the Adjusted R-squared value of 0.33 suggests that the model could be improved with the inclusion of additional variables. The F-statistic of 6.3574 and its associated p-value of 0.0068 indicate that the model is statistically significant overall. The Durbin-Watson (DW) statistic of 1.74 suggests that there may be a mild issue with autocorrelation in the residuals, which warrants further investigation.

Table 4.2.6: Heteroskedasticity Test: ARCH

F-statistic	0.012646	Prob. F(1,17)	0.9111
Obs*R-squared	0.013364	Prob. Chi-Square(1)	0.9080

Source: Authors Computation, 2024 (Eviews-10)

The Heteroskedasticity Test results using the ARCH method, presented in Table 4.2.6, indicate no significant evidence of heteroskedasticity in the regression model. The F-statistic of 0.012646 with a p-value of 0.9111 suggests that the null hypothesis of homoskedasticity cannot be rejected, implying that the variance of residuals is constant across observations. Similarly, the Obs*R-squared statistic of 0.013364 with a p-value of 0.9080 further supports the conclusion that there is no systematic variation in the residuals. Both tests indicate that the assumption of constant variance is valid, confirming the reliability of the regression results.

Test of Hypothesis

Statement of Decision Criteria

As stated by Gujarati and Porter (2009), the decision rule entails the rejection of the null hypothesis (H₀) and the acceptance of the alternative hypothesis (H₁) when the P-value associated with the t-statistic is less than 0.05. In practical terms, if the P-value falls below the 0.05 threshold, it signifies robust evidence to reject the null hypothesis, thus allowing the conclusion that the coefficient is statistically significant and distinct from zero. Conversely, when the P-value exceeds 0.05, the evidence is considered insufficient to reject the null hypothesis, leading to the acceptance of H₀.

Test of Hypothesis One

H₀: Government agriculture expenditures do not have a significant effect on the poverty headcount ratio in Nigeria.

H₁: Government agriculture expenditures have a significant effect on the poverty headcount ratio in Nigeria.

Presentation of Test Results

Table 4.2.5: Panel Regression Analysis was used to test the above-stated hypothesis.

Decision

From the bound test result in Table 4.2.5, the coefficient for AGREX is 0.151911, indicating that a one-unit increase in government agriculture expenditures is associated with a 0.151911 unit increase in the poverty headcount ratio. The P-value of 0.0329 is less than 0.05, providing sufficient evidence to reject the null hypothesis. Therefore, government agriculture expenditures have a statistically significant effect on increasing the poverty headcount ratio in Nigeria.

DISCUSSION OF FINDINGS

Results from regression analysis indicate that government expenditure on agriculture (AGREX) plays a significant positive role in poverty in Nigeria, which means that increased agricultural spending is accompanied by increased poverty. This finding is compatible with those of various studies that stress the mixed or inefficient effects of government agricultural expenditure in developing economies. An example, Eneji et al., (2019), stated that the government's agricultural spending initially had a positive contribution to productivity in Nigeria but the gains have been lost due to inefficiencies and misallocation of resources. In the same vein, Sebastian et al. (2019) stated in their research that there was a negative correlation between government agricultural spending and output, thereby the need to strategically and judiciously allocate farmers' funds for the agricultural sector to enhance productivity and reduce poverty. These studies argue that in some situations, agricultural spending does not technically bring economic benefit because of structural deficits such as mismanagement and poor policy enforcement.

Moreover, inflation and exchange rate fluctuations indicators (INFRATE and EXRATE) did not significantly affect poverty in this model, but other researchers have reported these variables as the ones that indirectly influence poverty, particularly in developing countries. For example, Dada and Fanowopo 2020 found that strong institutions and sound macroeconomic policies are key to poverty reduction through sustainable economic growth, which can, in turn, alleviate the negative impacts of inflation and exchange rate volatility. Another point that Eze et al. (2019) made was that government capital expenditure on agriculture is a major and immediate factor for sectoral growth and it can, thus, absorb the shocks of macroeconomic instability events such as inflation and currency fluctuations, on poverty.

The notable positive association between interest rates (INTRATE) and poverty is demonstrated by literature claiming that the debt payments besides the small capital availability are the aforementioned means of the high-interest rates which put stress on the poor people. Research, including Ahmed (2019) and Jimmy and Guluwa (2021), shows that higher interest rates can indeed make such activities difficult, especially for small businesses and poor households that use credit for growth. These results come together with the reduction of the use of money in the economy, which is noticeable in the world of the developing countries as the affected individuals consequently with access to the financial resources are limited. Hence, interest rate cuts and hence cheaper loaning are means by which poverty can be reduced, as low-income families will be the ones who will be coming with their dollars on the market.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The study focuses on the effect of government spending on agriculture; inflation, exchange rates, and interest rates on the poverty level in Nigeria. The research shows that spending on agriculture (AGREX) is a significant factor that increases poverty, which implies that the government should be careful about the fact that over-expenditure in the agriculture sector might be a factor that will result in poverty in the long run. However, even though the exchange rates and inflation were found to not have a significant impact on poverty, the findings about interest rates were significant as it was shown that higher interest rates were positively related to poverty, which means they lead to the increase of poverty by the introduction of additional expenses on credit and by making the access to financial resources strict. The study concludes that the overall economic policies are very complicated, and there is the problem that they might have negative effects rather than being helpful in the process of poverty reduction in the Nigerian agricultural sector.

Recommendations

The following recommendations are made based on the findings of this study:

- i. Agricultural Expenditure Inefficiency Handling: In as much as the study reported a positive relationship between agricultural spending and poverty, it is also clear that the lack of optimization in government expenditure may be the reason why the expected results are not achieved. Consequently, the government should aim to improve agricultural performance by giving priority to priority areas such as infrastructure,

irrigation, and technological innovation. Nevertheless, the financing needs to be only on capital projects, which will ensure substantial sector growth in the prolonged term.

- ii. Interest rate reduction: Being that there is indeed a direct relationship between the rate of interest and poverty, the policymakers are to look for ways of lowering the interest both to small businesses and low-income households. It would lead to more credits being available, thus the level of economic activity will rise and poverty will drop in the long run.
- iii. Fortifying Economic Policies: The government has to work toward achieving more far-reaching economic policies that will stabilize inflation and exchange rates as these factors can be the main indirect influences on the mass of the people. Economic stabilization and prudent fiscal management go hand in hand in reducing the negative effects of inflation and exchange rates on the hardy taxpayers.
- iv. Institutional Aspect Could Be Strengthened: Previous findings have affirmed the necessity of institutional strengthening and good governance for achieving efficiency in government spending and policies. Overbearing regulation and better law enforcement will increase the effectiveness of public expenditure, which is favourable for poverty alleviation purposes and vice versa.

Contribution to Knowledge

Research like this adds to the pool of available knowledge on the link between government spending and other macroeconomic variables and poverty in Nigeria by offering new perspectives on the mixed impacts of agricultural expenditure on poverty. Though the majority of the research done so far has stressed the positive effects of agricultural spending, this study, however, notes that such expenditures could lead to unexpected results if not properly handled. Moreover, the study's results concerning the crucial role of interest rates in deepening poverty give an additional perspective to the already ongoing discussion on the macroeconomic factors that affect poverty in Nigeria. The study further stresses the importance of a proper fiscal and monetary policy in poverty alleviation, thus accentuating the need for holistic strategies that take into account the interactions of various factors such as agriculture, interest rates, and other macroeconomic variables. The study, through these contributions, becomes a strong foundation for the government which is trying to decrease poverty and achieve sustainable growth in Nigeria.

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