Public Debt and Agricultural Sector Performance in Nigeria

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Abstract

This study examined public debt and agricultural sector performance in Nigeria for the period 1981-2022. The public debt variables included external debt, domestic debt, total debt and debt servicing. These constituted the specific objectives of the study. Agricultural sector performance was proxied with agricultural GDP. Data were sourced from the CBN Statistical Bulletin and analyzed using error correction model. The result indicated that domestic debt and total debt have positive and significant effects on agricultural sector output while external debt and debt servicing exerted a significantly negative effect on agricultural sector output in Nigeria. The study determined that foreign debt has had a major negative impact on the expansion of Nigeria's agricultural industry, owing to the overbearing effect of debt payment, which also reduces sector production. Domestic debt has had a relatively minor impact on the agriculture industry. It was suggested that the government directly support the agriculture sector through domestic borrowings and explicitly fund the sector with foreign borrowings designated for the agricultural industry. By doing this, loan service may be done directly from the earnings of agricultural produce, which increases agricultural productivity in Nigeria in the long term.

Key words: *Agricultural output, debt servicing, domestic debt, external debt, public debt*

1. Introduction/Background to the Study

Every nation has developmental goals that are aligned with macroeconomic objectives. Those goals are turned into particular programs such as providing basic infrastructure, revitalizing dormant public enterprises, reducing the budget deficit, providing and ensuring access to public welfare schemes, and so on. However, the availability of cash is a significant impediment to the implementation and realization of these objectives. When income falls short of projected costs, the government borrows to satisfy its statutory responsibilities. As a result, borrowing, which builds into what we call public debt, is one of the primary means of supporting a deficit budget. When government spending exceeds revenue, the economy experiences a deficit, and the government may choose to borrow to pay the budget deficit, resulting in a liability for itself known as public debt or government debt. Thus, public debt is the amount of money owed by

a country's government to an external organization, another government, or private individuals and organizations within the country (Chowdhury, 2021). Public debt can be classified into borrowings from external sources (external debt) and internal sources (domestic debt).

The International Monetary Fund (IMF, 2022) defines public debt as any liability that requires the debtor to pay interest and/or principal to the creditor at a future date or dates. This comprises debt liabilities in the form of SDR allocations, currencies, and deposits, debt securities, loans, insurance, pensions, and standardized guarantee systems, and other accounts payable. Also, public debt is the total amount of financial borrowings incurred by a country's government at any one moment, which includes cash due to private and governmental organizations, as well as foreign governments. According to Eke and Akujuobi (2021), public debt is a means utilized by governments to bridge their deficits and carry out economic initiatives that can raise citizens' living standards and promote sustainable growth and development with future payback.

A sector's contribution to GDP serves as a measure for determining its worth. In all, the non-oil sector generated 92.76 percent of Nigeria's GDP in 2022 (CBN, 2022). In 2022, the agriculture sector contributed for 25.9 percent of Nigeria's total GDP. As a result, the agricultural sector is an important structural component of Nigeria's economy and growth. As a result, continuous expansion and development of the agricultural sector provides an alternative to Nigeria's planned transformation from a mono-cultural oil-dependent economy to a diversified one (Izuchukwu, 2011). Stimulating agriculture output remains a top priority in the government's sectoral ranking. For the vast majority of Nigerians, it is viewed as a growth generator, wealth creator, and poverty-reduction industry. Agriculture accounted for 60% of employment in recent years (World Bank, 2021). Nigeria's agricultural output declined to ₦3,597,916.08 million in Q1 2019 from ₦4,978,775.48 million in Q4 2018. It-averaged ₦3,832,973.14 million from 2010 until 2022, reaching an all-time high of ₦5,288,339.21 million in the third quarter of 2018 and a record low of ₦2,594,759.86 million in the first quarter of 2010 (National Bureau of Statistics, 2021).

Over the last few decades, there has been growing worry over Nigeria's expanding public debt. Nigeria lent loans to the International Monetary Fund (IMF) during the oil boom in the 1980s, but was later ranked among Africa's leading nations with major public debt difficulties from 2000 to 2005 (Essien et al, 2016). "The first large surge in Nigeria's national debt came in 1987, when the entire debt grew to N137.58 billion, an increase of 96.9% (CBN, 2022). Since then, Nigeria's national debt has steadily increased, reaching N6188.03 billion in 2004 (CBN, 2022). Total debt, which had previously been mostly driven by domestic debt, shifted in 1986 to be driven by overseas debt (Ogwuche and Musa, 2024). As a result, the dominance of foreign debt and the continuous increase in overall debt persisted until 2005, when the Paris Club awarded the country a debt pardon. Between 2004 and 2006, debt forgiveness lowered Nigeria's overall and foreign debt by 59% and 90.8%, respectively, to N2,533.47 billion and N451.5 billion (Essien *et al*, 2016). Recently, records are showing that Nigeria sinks deeper into public debt unabated such that as at 2022, total public debt stood at ₦12705.62 trillion for external public debt and ₦16023.89 trillion" (CBN, 2022).

According to many research reports, public debt can have a good or negative influence on economic production. Yerima and Tahir (2020) and Olumo, John, and Mungai (2023) discovered that public debt has a positive impact on agricultural output in Nigeria, supporting previous research by Inyang and Effiong (2020), Donald and Shuanglin (2019), and Koman and Bratimasrene (2017), who believed the impact was positive and significant. Meanwhile, Ochalibe et al. (2021) revealed a detrimental impact of governmental debt on agricultural productivity in Nigeria. Adesola (2019) and Eze, Nweke, and Atuma (2019), among others, have already established that public debt has a negative and non-significant influence on production growth, whether agricultural or not. This suggests that the empirical data regarding the influence of public debt on agricultural productivity in Nigeria is inconclusive. As a result, this acts as inspiration for our study, as the study analyzes the extent to which public debt determinants impact agricultural production growth in Nigeria from 1981 to 2022. The following are the specific objectives: to examine the effect of external debt stock on agricultural output, ascertain the relationship between domestic debt stock and agricultural output in Nigeria, examine the effect of total public debt on agricultural output and ascertain how debt servicing affect agricultural output in Nigeria.

In line with the specific objectives of the study, we formulate hypotheses which will be tested in the course of the research. The hypotheses are stated in their null forms as follows:

Ho_1: There is no significant relationship between external debt and agricultural sector performance in Nigeria.

Ho_2: Domestic debt has no significant effect on agricultural sector performance in Nigeria.

Ho_3: There is no significant relationship between total public debt and agricultural sector performance in Nigeria.

Ho_4: Debt servicing has not significantly affected agricultural sector performance in Nigeria.

This research examines the impact of public debt on agricultural sector performance in Nigeria for 41 years, from 1981 to 2022. The public debt variables investigated are; external debt, domestic debt, total debt and debt servicing.

2. LITERATURE REVIEW

Keynesian Theory of Government Intervention

John Maynard Keynes had a significant effect on the evolution of economic theory in the twentieth century. This theory is closely tied to Keynes's (1936) concept, and it is based on the premise that state intervention in the economy is necessary due to the reality of market failure. In response to the high Depression and its accompanying effect on the economy, According to Bilan (2016), the Keynesian ideology assigns high significance to the state, whose interventions in the economy are regarded useful in supplementing the activities of the free market and its faults.

Keynes argued for aggressive state engagement in the economy through different methods of funding government spending. Keynes (1936) emphasized the need of using public debt to sustain national economies during peak and trough periods of the business cycle, particularly to fund short-term economic stimulus measures. His followers proceeded to investigate government meddling in the economy. Traditional Keynesians believe that public borrowings do not need to crowd out private investment since rising aggregate demand improves the profitability of private investments (Bernheim, 1989). The theory is based on the assumption that public borrowing promotes economic growth by providing funds to finance economic growth through the availability of funds to finance revive infrastructure, which can create more job opportunities, improve income and living standards, and thus reduce poverty in the economy.

The "law of increasing state activity" idea, which posits that higher government expenditure boosts domestic economic activity and attracts private investment, helped to strengthen Keynesian theory. (Nkanywa and Masoga, 2018; Hilton, 2021). Thus, Keynesian thinkers neglected the difficulty of funding budget deficits using either tax cuts or borrowing, and stressed regular governmental intervention to stimulate aggregate demand, jobs, and output, fuelled by government borrowing, either domestically or abroad (Nwannebuike Ike and Onuka, 2016). It is a unidirectional growth theory that holds that debt-financed public expenditures have a fiscal multiplier effect on national production. (Elmendorf, Mankiw, 1999). It is assumed that governmental debt withdraws cash from private investors but has no effect on consumption since the borrowed money are reinvested in the economy to enhance aggregate demand, maybe through wages and salaries and other capital expenditures (Onogbosele and Ben, 2016). The Keynesian theory also indicates that a big public debt is a national asset rather than a liability (Driessen and Gravelle, 2019; Syder and Isagua, 2021), and that sustained deficit spending is crucial to economic success (Obademi, 2012).

The Keynesian hypothesis, however, contradicts the goal of a fiscal boost. As a result, government borrowing will attract higher interest rates, implying crowding out. This may counteract the stimulatory effect of expenditure. When the government has a budget deficit, monies are borrowed from the public, which can be both external and domestic. According to Okodua et al. (2020), when governments pay a deficit by issuing government bonds, interest rates might rise across the market because government borrowing produces more demand for credit in the financial markets.

Inyang and Effiong (2020) have evaluated the potential impact of external debt on Nigerian economic development using yearly data from 1981 to 2019. The study applied the ARDL Bounds test technique to cointegration and the error correction model. Their findings indicated that the debt load had a favorable but small influence on economic growth. Adesola (2019) investigated the relationship between low economic development and debt services in Nigeria, with a specific emphasis on the consequences of debt repayment to creditors on Nigerian economic growth. The study employed time series data from 1981 to 2004 using the ordinary least squares regression method. The empirical findings demonstrated that debt payments to other creditors, including London Club creditors, had a significant negative impact on Nigeria's GDP and gross fixed capital creation. Eze, Nweke, and Atuma (2019) investigated the effects

of public debt on the Nigerian economy. Annual time series data from 1981 to 2017 were obtained from the CBN statistics bulletin and analyzed using the ARDL estimate approach and the Chow breakpoint test. According to the study's findings, external debt had a negative and large influence on GDP in Nigeria, whereas domestic debt had a negative but moderate impact on GDP.

Yerima and Tahir (2020) investigated the influence of foreign debt on Nigerian agricultural production from 1980 to 2016, employing the Autoregressive Distributed Lag (ARDL) model. The investigation found that foreign debt stock has a considerable positive influence on agricultural productivity, implying that debt promotes agricultural expansion. Their findings also revealed that foreign debt servicing has little influence on agricultural productivity in Nigeria. In their study on the link between government public expenditure and economic growth in Asian nations, Donald and Shuanglin (2019) and Koman and Bratimasrene (2017) discovered that government expenditure is supported by external borrowings, which has a direct and beneficial influence on their economies.

Another favorable association between debt and the agricultural sector was discovered by Ochalibe, Apeverga, and Omeje (2021), who investigated the relationship between government expenditure, debt policy instruments, and agricultural growth in Nigeria from 1980 to 2018. In evaluating the data, the study used trend analysis, the distributed lag model, two stage least squares (2SLS), and the difference-in-differences estimation model (DID). The study's results reveal that an increase in debt leads to a decline in agricultural growth, and macroeconomic policy instrument dynamics have a negative influence on agricultural growth. Osuji, Ehrijakpor, and Mgbeze (2023) discovered a significant positive relationship between external debt stock and agricultural production, as measured by agriculture gross domestic product (AGDP), indicating that higher external debt stock accelerated agricultural growth over time.

Ogwuche and Musa (2024) concluded that state debt has no substantial influence on agricultural productivity in Nigeria. Their research also revealed that public debt had a negative link with agricultural output in Nigeria throughout the study period, with a one-way causation relationship between the two variables. The study effort of Ebhotemhen and Umoru (2019) indicated that external debt failed to generate improvement in production returns in agricultural productivity due to its adverse relationship with agricultural output. This suggested that foreign loans secured for agriculture during the research period were not adequately utilized for the same purpose. Anu et al. (2024) argued that state debt has a major negative impact on Nigerian growth. However, when looking at the sector-specific effect, the effect of public debt remains large and negative for both agricultural and industrial sectors. This implies that greater levels of public debt are associated with weaker growth in these two sectors.

Clearly, research on the relationship between governmental debt and agriculture sector performance has yielded diverse outcomes. This might be related to the number of years covered, the nation or region under investigation, the technique used, or the aggregate of public debt. In this context, our analysis divides public debt into external and domestic debt, as well as debt payments, to determine how public debt affects agriculture sector performance. To the

best of our knowledge, no other researcher has used this combination, and we aim to go farther to examine this link using more rigorous econometric tools.

METHODOLOGY

The study is quantitative in nature, therefore it will use an ex post facto research approach to assess the link between public debt and agriculture sector performance. This study used secondary data from the Central Bank of Nigeria (CBN) monthly bulletin and the National Bureau of Statistics (NBS), which covered the years 1980 to 2022. The research data analysis approach is multiple regression analysis inside the Error Correction Model (ECM) framework.

The error correction model is used to estimate the link between public debt factors and agricultural performance since the time series data revealed first order integration as well as cointegration (Egbulonu, 2019). The higher the parameter's coefficient, the faster the model adjusts from short to long runs, and vice versa. The R-squared, F-statistic joint test, and Durbin Watson tests are used to evaluate the model's fitness, joint significance, and serial correlation. The econometric approach is selected for the analysis since the research is empirical in character. The data for the study is time series, which, in this case, comprise of numerous independent variables (Egbulonu, 2019). Given the nature of data, it is further converted into natural log form to enable efficient estimation.

Model Specification

By modifying the specification of Ogwuche and Musa (2024), we maintain agricultural sector GDP as the dependent variable but we disaggregate debt into external and domestic debt while also using aggregated public debt as the third variable. Additionally, debt servicing is used as the fourth explanatory variable in the model and we specify as follows:

$$AGR = f(PUD) \quad [i]$$

The functional form of the model is specified below:

$$AGR = f(EXD, DOD, TOD, DSE) \quad [ii]$$

By representing the above functional model in econometric form, we have:

$$AGR = a_0 + b_1EXD + b_2DOD + b_3TPD + b_4DSE + U_t \quad [iii]$$

Where:

AGR = Agricultural Sector output

PUD = Public Debt

EXD = External Debt

DOD = Domestic Debt

TPD = Total Public Debt

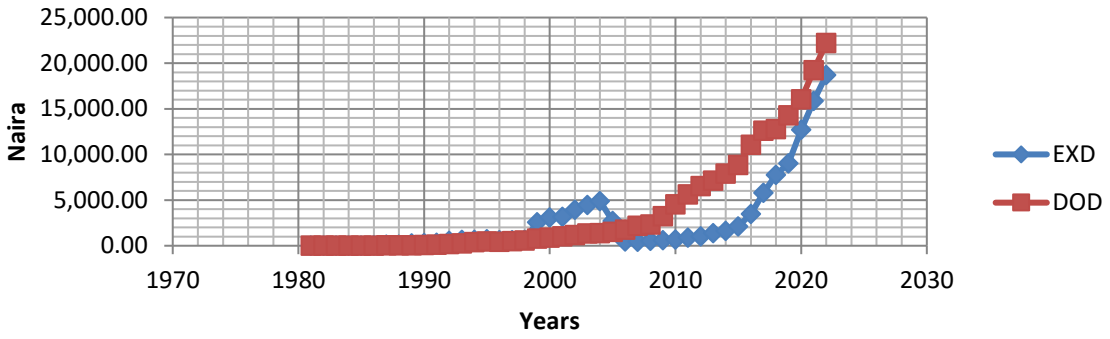
DSE = Debt Servicing

The a-priori expectation is that the coefficients of public debt should have positive and significant effect on agricultural output i.e. $a_0 > 0$; $b_1 - b_4 > 0$

4. DATA ANALYSIS AND DISCUSSION

The trend analysis of public debt in Nigeria shows that external debt only exceeded domestic debt in the late 1980s through the early 2000s. As at 2005 when Nigeria was granted debt relief by most of the international debt clubs, Nigeria's external debt stood at ₦2.695 trillion as against domestic debt that was ₦1.525 trillion. The figure 1 below shows this trend more clearly:

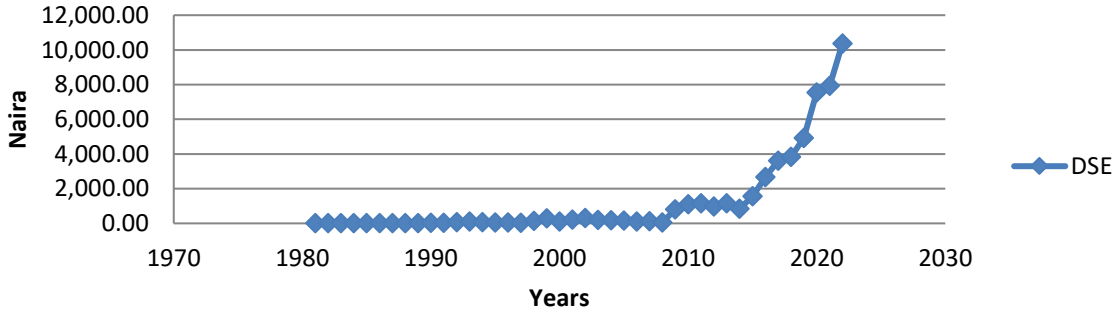
Figure 1: Comparison of external and domestic debt



Source: Computed using CBN Data

The figure 4.1 further shows that after 2005, external debt experienced a significant dip dropping to ₦451 million which represents more than 300 per cent debt relief. Subsequent years from 2009 through 2022, domestic debt has exceeded external debt. However, with external debt put at ₦18.7 trillion as at end of 2022, and domestic debt reaching ₦22.2 trillion, Nigeria's total public debt of more than ₦40 trillion is far exceeding the safety threshold.

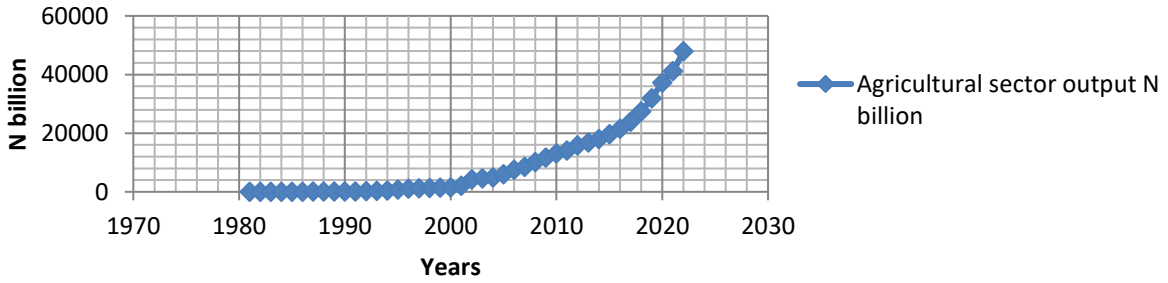
Figure 2: Trend analysis of Nigeria's debt servicing



Source: Computed using CBN Data

Figure 2 above shows that Nigeria's debt servicing history has been a situation of a steady increase from 1981 through to the current period 2022. The gradual increase in debt servicing is a result of the increasing trend of public debt in the country. With debt servicing dropping to as low as ₦47.38 billion in 2008, subsequent years recorded massive increase in debt servicing. The year 2022 saw Nigeria's debt servicing reaching ₦10.369 trillion which represents 25 per cent of Nigeria's total public debt.

Figure 3: Agricultural output in Nigeria



Source: Computed using CBN Data

Descriptive Statistics

The descriptive statistics comprises of the mean of the variables, the degree of skewness and standard deviation. These statistics are important in the research because they help to ascertain the suitability of the data for analysis.

Table 1: Summary of the Descriptive Statistics

	AGR	EXD	DOD	TPD	DSE
Mean	9450.626	2702.228	4038.054	6740.283	1208.924
Median	3133.470	669.3250	1091.485	3107.870	125.2750
Maximum	47944.06	18702.25	22210.36	40912.62	10369.72
Minimum	17.05000	2.330000	11.19000	13.52000	2.660000
Std. Dev.	12611.17	4281.546	5852.148	9816.273	2387.255
Skewness	1.465765	2.353025	1.592670	2.031677	2.484928
Kurtosis	4.328597	8.076075	4.541301	6.478005	8.457899

Jarque-Bera	18.12831	83.84852	21.91350	50.06290	95.35422
Probability	0.000116	0.000000	0.000017	0.000000	0.000000
Sum	396926.3	113493.6	169598.3	283091.9	50774.81
Sum Sq. Dev.	6.52E+09	7.52E+08	1.40E+09	3.95E+09	2.34E+08
Observations	42	42	42	42	42

Source: Eviews output (Appendix E)

Table 1 above illustrates the summary statistic of the variables. The mean value which is the average of the distribution for agricultural output (AGR), is ₦9,450 billion. External debt for the period averaged ₦2,702 billion while domestic debt averaged ₦4,038 billion. With debt servicing averaging ₦1,208 billion, it is evident that Nigeria's debt servicing is on the rise. Furthermore, the data for domestic debt (DOD), total debt (TPD) and debt servicing (DSE) have very minimal dispersion from the mean with standard deviation not far exceeding the mean values. However, the standard deviation values for agricultural sector output (AGR), has high dispersion from their mean values.

The skewness of the data suggests that all variables have lengthy right tails, as demonstrated by their positive elasticity. This means that they are all positively biased, lending the data significant credence. The Jarque-Bera statistic suggests that all of the data are normally distributed, since their p-values are less than the crucial threshold of 0.05. Thus, the data utilized in the modeling has a normal distribution based on the Jarque-Bera statistics' p-values. Overall, the summary statistics above demonstrate that the data are well balanced on both sides of the standard normal curve and do not exhibit significant dispersion from the mean position. We now proceed with the stationarity test in order to confirm whether the data follows a stationary process.

Unit Root Test

Table 2: Summary of the Unit Root Test Result (with intercept and trend)

	ADF Test statistics			
Dependent Variables (DV)	**At Level**	**1st Difference**	**Decision**	**Order of Integration**
Agricultural Output (AGR)	-0.27109 [0.9889]	-4.4674 [0.0051]	Stationary at 1st difference	I(1)
Independent Variables (IV)				
External Debt (EXD)	-1.9849 [0.5916]	-4.8441 [0.0018]	Stationary at 1st difference	I(1)
Domestic Debt (DOD)	-1.6369 [0.7601]	-4.9772 [0.0013]	Stationary at 1st difference	I(1)
Total Public Debt (TPD)	-2.1971 [0.4782]	-4.7193 [0.0026]	Stationary at 1st difference	I(1)
Debt Servicing (DSE)	-3.5133 [0.0511]	-7.5185 [0.0000]	Stationary at 1st difference	I(1)
Critical Value at 5% Level = *-3.5236*				

Critical Value at 5% 1ts diff = *-3.5266*

Source: Researchers' Computation using E-Views 9.0

Due to the time series nature of the variables, we first carried out a test of stationarity using the Augmented Dickey Fuller unit root test. The unit root test above reveals that the data on agricultural sector output (AGR), external debt (EXD), domestic debt (DOD), total public debt (TPD) and debt servicing (DSE) achieved stationarity after first differencing. This also indicates an I(1) order of integration. In other words, none of the data achieved stationarity at level but only after first differencing. The stationarity test above implies that the data utilized in the model have statistical qualities that have not changed across the research period, which is 1981-2022. This suggests that the data used to anticipate the effect of public debt on Nigeria's non-oil industry is accurate and does not show any structural breaks in the pattern. Based on this conclusion, we use the Johansen cointegration test to determine whether there is a long-run connection or cointegration among the variables in the model.

Cointegration Test

Table 3: Summary of the Johansen Cointegration Test

	Trace statistic		**Max-Eigen statistic**	
	Trace stat.	***p-value***	**Max-Eigen**	***p-value***
Dependent Variable = AGR	80.69863	*(0.0053)*	32.32998	*(0.0456)*
	48.36865	*(0.0447)*	22.14280	*(0.2131)*
	26.22586	*(0.1221)*	12.42733	*(0.5061)*
	13.79852	*(0.0886)*	11.13422	*(0.1476)*
	2.664300	*(0.1026)*	2.664300	*(0.1026)*

Note: ** indicates that the test statistics are significant at the 5 per cent level.
Source: Researchers' Computation using E-view 9

The null hypothesis for the Johansen test and the alternate hypothesis is stated below:

H_0: No long run relationship between public debt and agricultural sector in Nigeria.

H_1: There is long run relationship between public debt and agricultural sector in Nigeria.

The long run test assesses if the anticipated estimations of the public debt variables can be sustained in the long run or whether changes may be made to provide a short run effect. Table 3 presents the Johansen cointegration test using the Trace and Max-Eigen statistics. The trace test yields two significant p-values of 0.0053 and 0.0447 at the 5% level. This suggests two cointegrating equations. The Max-Eigen test identified just one cointegrating equation. The substantial p-value indicates that we reject the null hypothesis and conclude that there is a long-term link between state debt and production in Nigeria's agriculture sector. In other words, public debt has long run effect on the growth of the agricultural sector in Nigeria. This test confirms the long run relationship between public debt variables and agricultural sector performance in Nigeria.

Estimation of the Models' Parameters

Table 4: Error Correction Model Results

	Error Correction Model Estimates			
Variables	**Coefficient**	***Std. Error***	**t-stat**	***p-value***
C	-1.735097	0.433020	-4.006969	0.0003
D(EXD)	-0.464458	0.197596	-2.350546	0.0249
D(DOD)	0.726695	0.251981	2.883926	0.0069
D(TPD)	1.166783	0.424612	2.747878	0.0096
D(DSE)	-0.282638	0.072024	-3.924232	0.0004
ECM(-1)	-0.123263	0.020481	-6.018407	0.0296
R-squared = 0.8187; F-stat = 57.89 (p-value =0.0000*); DW = 1.8117				

The Error Correction Model must be estimated in order to reconcile public debt's short-run and long-run behavior, as well as to study the adjustment mechanisms leading to long-run equilibrium. The predicted pace of adjustment is 12.33%, which explains the long-term corrective process. The error correction coefficient is negative and substantial, implying that the short run model has high predictive characteristics.

The result revealed that firstly, external debt (EXD) exerted negative effect on growth of the agricultural sector decreasing it by 0.4645 units. This means that a unit change in external debt decreases the output of the agricultural sector in Nigeria by 0.4645 units. The decrease was significant given the *p-value* of 0.0249. Domestic debt (DOD) increased output of the agricultural sector by 0.7267 units. The probability value showed significant increase in agricultural sector occasioned by changes in domestic debt. This implies that Nigeria's domestic debt standing exert positive and significant effect on the agricultural sector even as it is on the increase. This may be adduced to the low debt servicing which characterizes domestic borrowings thus giving the government enough funds to channel into growth of the agricultural sector.

The inclusion of total public debt in the model shows that it increases agricultural output significantly by 1.1668 units (*p-value* = 0.0096). The increasing effect of total public debt on agricultural sector performance may be due to the channeling of external borrowings and domestic borrowing towards various agricultural development programmes in Nigeria. It is a pointer to the fact that government efforts towards revitalizing the agricultural sector through funding from external and domestic borrowings will yield the desired results when the funds are adequately utilized.

Debt servicing maintained negative effect on the agricultural sector performance. There is 0.2826 units decrease in agricultural output occasioned by changes in debt servicing. The *p-values* indicate that the decreasing effect of debt servicing on agricultural sector performance is significant in the short run analysis.

Diagnostic tests summarized in Table 4 above shows that the error term of the model is not serially correlated given that the *Durbin Watson statistic* is closer to 2 than to 0. This is based on the rule of thumb. In other words, the errors observed in the data collection process did not affect the subsequent observations and this makes the regression estimates reliable. The estimated R-squared value implies that public debt variables explain 81.87 *per cent* of the changes in agricultural sector performance in Nigeria. When held jointly, external debt, domestic debt, total debt and debt servicing have joint significant effect on output of the agricultural sector in Nigeria given the significant *p-value* of the F-statistic.

Table 5: Test of Hypotheses

Hypotheses	**t-statistic (*p-value*)**	**Decision**
Ho_1: There is no significant relationship between external debt and agricultural sector performance in Nigeria.	-2.3505 (0.0249)	There is significant relationship between public debt and Agricultural sector performance in Nigeria.
Ho_2: Domestic debt has no significant effect on agricultural sector performance in Nigeria.	2.8839 (0.0069)	Domestic debt has significant effect on agricultural sector performance in Nigeria.
Ho_3: There is no significant relationship between total public debt and agricultural sector performance in Nigeria.	2.7479 (0.0096)	There is significant relationship between total public debt and agricultural sector performance in Nigeria.
Ho_4: Debt servicing has not significantly affected agricultural sector performance in Nigeria.	-3.9242 (0.0004)	Debt servicing has significant effect on agricultural sector performance in Nigeria.

Discussion of Findings

The results revealed that total public debt with the intervening effect of debt service increased agricultural output significantly for the period studied. This means that there is a direct relationship between public debt and agricultural sector output in Nigeria. In other words, there is significant increase in agricultural output occasioned by increase in Nigeria's total public debt as observed by Ndubuisi (2017). When the total public debt is disaggregated into external and domestic debt, the results showed that while external debt decreased agricultural output significantly, domestic debt increased agricultural output significantly.

The inverse effect of external debt and debt servicing on the agricultural sub-sector corroborates the earlier finding of Ebhotemhen and Umoru (2019), Ukpe, Djomo, Filli,and Osayi (2020), Ayadi and Ayadi (2008), etc. However, the study of Osuji, *et al* (2023), Yerima and Tahir (2020) found that external debt stock positively impacted on agricultural growth.

Other studies such as Abula and Mordecai (2016), Ukpe, *et al* (2020), etc. found positive effects of domestic debt on the growth of the agricultural sector in Nigeria. This implies that the agricultural sector has benefitted from capital input from the government budget. The funds injected into the agricultural sector are mostly generated from domestic borrowings and this has shown to positively influence growth of the sector.

While domestic debt effect on agricultural output is positive, there is bound to be increased debt servicing as a result of increase in domestic debt. Essien *et al* (2020) noted that domestic debts are contracted within Nigerian borders, usually through bond and Treasury bills which are purchased by Nigerian banks, local pension funds, and other domestic and foreign investors. Debt servicing increases as government increases domestic debt profile. The inclusion of debt servicing in the model returned negative coefficient which implies that debt servicing decreases agricultural sector output significantly. Domestic debt, according to Ujuju & Oboro (2017) should be evenly matched with external debt so as to provide an adequate mix and also ensure that the value of goods and services produced with such debts are in excess of the cost of the debt. Saibu and Alenoghena (2017) argued that debt servicing should exert positive effect on the productive sectors because the servicing should ideally be from the proceeds of the investments of these funds. The negative effect found in this model gives credence to the fact that external debt are not being utilized adequately to fund projects in the agricultural sector in Nigeria.

Conclusion and Recommendations

This study analyzed the effect of public debt on growth of the agricultural sector in Nigeria. The study can be said to be from a sectorial perspective as it improved on previous studies which examined public debt on the growth of the overall economy. This gives it a new dimension and interesting outlook. The emphasis on public debt (both external and domestic) emanates from the fact that the Nigerian government has in recent times proposed and actually executed external borrowings coupled with domestic borrowings in order to raise funds for various developmental projects.

The conclusion emanating from the findings is that both external and domestic debt profile of Nigeria have exerted significant effect on the agricultural sector in Nigeria. However, external debt appears to be significantly detrimental to growth of the agricultural sector mainly due to the over-bearing effect of debt servicing on the economy. The effect of domestic debt on sectors' performance has been substantially mild. Overall, the study found that public debt explain more than 80 per cent of the changes in Nigeria's agricultural sector performance and for this reason, the Nigerian government needs to effectively device a means to fund projects in the agricultural sector from sources other than external borrowings. The recommendations made below can serve as a policy direction for the government.

There is need for the government to directly finance the agricultural sector from domestic borrowings as this has proven to have a positive and significant effect over time. The proceeds from domestic borrowings can suffice for the agricultural sector and this should be the

emphasis of the government. Also, ensuring judicious utilization of these funds is of paramount importance to achieve the desired result.

The on-going infrastructural renaissance in the agricultural sector funded partially by externally and internally borrowed funds should be sustained by the government. However, the negative effect of external debt on agricultural sector output can be decreased by raising funds internally and decreasing external debt.

Nigeria's total debt can be effectively serviced using proceeds from the agricultural sector. The negative effect debt servicing exerts on agricultural sector output points to the direction of non-utilization of borrowed funds for production in the agricultural sector and this depletes the funds available for investment in the agricultural sector. Government should specifically fund agricultural sector development if they want to augment with borrowed funds and these funds should also be specifically serviced from proceeds of the sector.

The researcher acknowledges that this current study does not exhaust knowledge of the relationship between public debt and agricultural sector performance in Nigeria. As a result, it is suggested that further research need be conducted on the cost of debt capital. Accumulating public debt may not have dire consequences on the non-oil sector but the cost of debt may have. So this new area of knowledge is suggested. Also, the effect of specific external debt sources such as the IMF loans, and other debt clubs on growth of agricultural sector can be explored by future researchers.

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