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Effect of State Bonds on the Private Sector: Evidence from a Growing Economy

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ABSTRACT

The frequent issuance of state bonds or securities by the government in the stock market crowds out the private sector in developing economies. The main concern is whether the economy can continue to function normally in the face of this occurrence if it is not checked. We use an Autoregressive Distributed Lag (ARDL) co-integration approach to confirm this scenario using data from the World Development Indicator and the Central Bank of Nigeria, spanning 1989 to 2021. The analysis' findings indicate that lowering borrowing costs will not put a strain on the private sector. However, the current government borrowing domestically has no significant positive influence, confirming that if the government does not reduce the amount of securities in the stock market, investors will continue to invest in government bonds while ignoring corporate bonds. This finding implies that the economy will not be in parity because private sector investment will be stifled. In accordance with the study, the government should promote private sector operations by lowering interest rates and regulating borrowing limits to ensure that they do not exceed the threshold that is beneficial to both the economy and private sector operations.

Keywords: state bonds; private sector; investment; borrowing cost; stock market

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INTRODUCTION

The private sector is said to be the driving force of trade and industry evolution for a nation, particularly for emerging countries [1]. Too much borrowing by the government at the cost of the private sector, the control tower of the economic system, raises doubts about the reliability of the government's industrial policy. The National Government issues bonds in the Nigerian Exchange Group Plc ('NGX Group') through the Debt Management Office (DMO), at month-to-month sale prices, and these securities are then advertised on the stock market for investing. These semi-annual, coupon-paying bonds are supported by the Federal Government of Nigeria's entire trust and confidence. FGN debt securities earnings are tax-free. The National Government issues treasury bonds, Sukuk bonds, savings bonds, green bonds, and Eurobonds among others, helping to make Federal Government bonds the most liquid, attractive and capitalized securities on the Nigerian Exchange Group Plc. This is why it has become very critical and alarming because the attraction to government bonds by investors is now putting the private sector at risk due to the thronging out consequence of administration borrowing using bonds. As a result, experts and equity market participants have excoriated the government's exorbitant borrowing from both domestic and foreign markets without regard for cash flow to payback the debt, even as it has attained the disturbing juncture of pushing out the resourceful private sector. The trickle-down effect on the private sector is a significant threat to the real sector's capability to produce wealth and employment [2].

To induce the private sector to start raising debt financing, interest rates must be kept as low as possible. As a result of counterproductive funding, the economy suffers, and total savings fall as a result of capital crowding out [3]. According to [2], if the authority reduces its debt levels in order to control the rising cost of loan maintenance, funds will flow to the common stock market as investors seek higher yields, especially as these companies' earnings improve, supporting stock value and dividend payments.

Public debt is typically the result of fiscal policy expansion in order to satisfy public needs for more social amenities and infrastructure [4]. In general, when the government decreases the amount of money invested in the economic system, there will be a decline in the

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country's long-run economic growth [3]. According to [3], this upshot can be negated to some extent if new fiscal stimulus is in the context of resourceful investment in human capital, public assets, social utilities, and research and development projects.

When a country reaches a borrowing limit or has a sovereign debt ceiling, its productivity recovery can suffer immensely. This could be accomplished through increases in interest rates, rising inflation, and a reduction in private sector investment [5]. The purpose of this research is to determine the impact of government bonds on private sector investment and operations. Several empirical studies have been conducted on the impact of government bonds on the national economy. The most recent works are those done by [6–10]. Considering the works of [4, 11–13] on the effect of state bonds on private sectors, no conclusion was reached on how private sectors are affected generally in several economies. The current study fills that void by shedding light on the impact of state bonds on private sector operations in a developing country. We use stock-market-issued state bonds as well as the general interest rate to confirm the response of the private sector to receiving adequate funding for its operations.

LITERATURE REVIEW

Conceptual Review

State bonds are widely marketed on the fixed-income securities exchange, serving as extremely important standard bond yields for most forms of privately issued company's shares at both theoretical and practical stages [14]. Government debt raises the possibility of companies' imminent tax intensifications or economic exploitation of business investments [15]. Simultaneously, some research indicates that public debt can enhance organizational direct exposure to the international lending market [16]. According to [17], supreme pledges provide substantial advantages to the development of commercial bond markets in unindustrialized parsimonies. As a result, output drops because new investment is more resourceful than old capital, and a lower interest rate on accumulating capital results in less growth in the economy [16].

Government residential debt is used for a variety of purposes, including financing the budget shortfall when the government is unable to satisfy its expenditure commitments using domestically raised revenue and externally sourced grants and borrowing. Green bonds are like traditional debt instruments, but they are primarily intended to boost funds to finance sustainability initiatives [18]. The delivery of interest-bearing public bonds makes commerce and assessment of all investment products that can provide cash flows to financial assets easier [16].

Theoretical Framework

The major idea supporting this work is the theory of capital and investment propounded by Fisher in 1930. Capital is gathered to enable private sector investment, which are inputs into the productive economy. Consequently, Fisher described capital as an investment vehicle that generates a consistent income stream over time. As a result, best possible capital formation would act as a driver for economic expansion [19]. Fisher [20] presumed that all finance was purely to make funds available for investment and that wealth was being used up in the process of production, so a portfolio of reserved equity was not included in his hypothesis of investments and capital, rather it is expressed that all capital is an investment. Since the state has a greater credit worthiness than the private industry, it crowds out the private sector in mobilizing funding for investment, thereby reducing their growth potential [21].

Empirical Review

Impact of State Bond on Economic Growth

The sovereign obligation is the cash the regime obtains from either international creditors or residents within the nation, and it grows as the government engages in more fiscal stimulus [22, 23]. Government borrowing permits the federal government to spend on activities that contribute to the economic system where tax income is insufficient to fund such initiatives [24]. It ought to be stated that using municipal liability to fund management outlays can be hurtful to frugality [25, 26]. Government borrowing can have a beneficial or detrimental effect on the budget, contingent on the level of borrowing and its objective [27]. For example, in 2020 and 2021, the supply of state debt instruments in developed economies significantly increased as authorities issued bonds to pay for their government's financial response to the bubonic plague [28]. Nevertheless, if such spending increases are required, they must be funded via taxes rather than issuing debt [26].

Koka [19] examined the link between the issuing of Government debt instruments and wealth creation in Kenya utilizing data collected from 2003 to 2011. The findings revealed that the issuing of government securities had a beneficial impact on Kenya's productivity expansion. Oke et al. [7] looked into the influence of bond market development on Nigerian economic growth from 1986 to 2018. Government securities had an unimportant favorable connection; corporate bonds and the value of bonds traded had a beneficial and statistically significant relationship; and bond yield had a negative correlation with Nigerian economic growth. Mhlaba and Phiri [29] assessed the long-term and short-term consequences of public debt on economic expansion in South Africa from 2002 to 2016. The researchers reported that all projected regressions found a strong negative debt-growth association, with the negative correlation reinforcing post-crisis. Saungweme and Odhiambo [30] investigated the causal links between public debt and economic growth, as well as public debt service and economic growth in Zambia from 1970 to 2017. The results of this analysis found no link between sovereign debt service and economic expansion in Zambia.

Yusuf and Mohd [10] examined the impact of sovereign debt on Nigerian economic growth from 1980–2018. Findings revealed that foreign debt was a long-term growth hindrance, while its short-term actual impact was economic expansion-driven. Household debt had a major positive effect on long-term advancement while having an adverse effect on short-term economic expansion. Both the long- and short-term cost of borrowing decreased development substantially, affirming the debt overhang consequence. According to Teixeira et al. [9], sovereign bonds had no influence on bank credit risk but had an influence on financial performance, with government borrowing financial products having a beneficial impact on asset profit growth in the long term. Omodero and Alege [8] studied the sway of various public-sector bonds on Nigerian economic growth between 2003 and 2019. The results revealed that treasury bills and FGN bond funds had a positive and significant impact on the country's economic growth. Treasury bonds and higher inflation, on the other hand, had a considerable negative impact on economic growth. However, some debt securities and commitments had a relatively insignificant adverse effect on economic growth. Nneka et al. [6] investigated the impact of sovereign debt expansion on economic growth in a sample of evolving nations from 1990 to 2020. The study discovered that government debt capitalization, trade openness, and rising prices all had a beneficial effect on economic growth, whereas corporate debt capitalization and household credit available to the private sector had a detrimental effect on economic expansion and stability.

Effects of State Bond on Private Sector Investment

High levels of public debt may also have an impact on private investment through a variety of channels [31, 32]. When accessing stock markets, both the public and private sectors will start competing for limited resources if the portfolio of bank loans is narrow. As the government borrows more, fewer funds are available for the private sector. This raises interest rates for the private sector, resulting in less private sector investment.

Ambaye et al. [33] used historical data from 1992 to 2010 to investigate the drivers of national private sector investment in Ethiopia. The study used an Autoregressive Distributed Lag (ARDL) model and the bounds test method to simulate the long-term key drivers of home capital funding. The research identified exchange rates, internal saving, and financial deepening as major elements having a significant and negative influence on private sector investment. Mbate [34] anticipated an interactive cross-country framework and examined the effects of internal debt on the economy and private sector financing in a panel of 21 Sub-Saharan African (SSA) nations from 1985 to 2010. The System-GMM analysis indicated a non-linear correlation between national debt and GDP growth, with an optimum major shift of 11.4 percentage points of GDP. Furthermore, household debt was discovered to crowd out private enterprise finance by an elastic modulus of –0.3% of GDP, discouraging capital formation and private industry expansion.

Lidiema [35] investigated the impact of government domestic borrowing on private investment in Kenya. The analysis indicated that household debt had a significant and negative association with gross fixed capital creation. The findings also demonstrated that the administration's exorbitant internal borrowing had an adverse influence on private sector investment, which ultimately impaired economic growth. Bouis [11] examined the connection between banks' holdings of national jurisdictional bonds and private-sector credit expansion in emerging

and developing nations. According to the assessment, the poor association between banks' assertions on the government and private sector credit growth was primarily due to banks' portfolio realignment toward relatively safe, more liquid government resources during times of heightened stress, with only scant data of a crowding-out influence attributed to financial suppression. Ahmad et al. [21] investigated the link between public debt and private sector growth in Nigeria. It employed the Structural Vector Auto-regressions model to analyze the complexities of federal debt actions on the advancement of Nigeria's corporate companies. The results of impulse responses and regression analysis seemed to indicate that government debt management had a detrimental effect on the efficiency of private sector growth in Nigeria. W. Obeng-Ampousah et al. [1] showed there was no long-run relationship between the variables, but a considerable short-run relationship between government debt and the private sector, broad money, and gross capital accumulation.

Akanbi [4] examined the effects of household government debt on private sector financing in Nigeria. The findings revealed that, while not statistically relevant, prime loan rates have a beneficial influence on the government's bond issuance. The results also showed an inverse correlation between federal government internal debt issuance and bank lending to the private sector. Mwakalila [36] factually scrutinized the effects of government spending and national borrowing on private sector financing in Tanzania by raising loan rates. In the long-term, government spending and internal borrowing crowded out credit for the private sector by increasing borrowing costs.

Kayongo [12] demonstrated that the effect of government investment on private sector investment was not as considerable as the influence of public household debt, implying that government investment was not supplementary to private sector investment. Interest rate fluctuations had a hurtful impact on private investment, whereas GDP growth stimulated more private sector investment. Vanlaer et al. [13] examined whether higher government debt led to less private sector investment, a phenomenon known as the debt overhang effect. Using an instrumental variable framework, the study addressed the likely endogeneity between private sector ventures and other macroeconomic indicators. The findings reinforced the commitment-outcropping proposition and demonstrated that this connection could only be explained through the government debt stream.

METHODOLOGY

The Autoregressive Dispersed Interval co-integration style or bound co-integration technique was used in the study. The Amplified Dickey-Fuller Trial unit root test and Phillip Perron were used to investigate the degree of connectivity. This check was used as a foundation for determining the most appropriate prediction models for the analysis. Data for the research emanates from the World Expansion Pointer and the Central Bank of Nigeria databases. The study lasted from 1989 to 2021.

The model provided for this investigation is highlighted in Equation 1:

$$Y = \beta_0 + \beta X + \beta X + \mu_{it}, \quad (1)$$

where Y = Credit available to the private sector; X_1 = = State bond; X_2 = Inflation; β = Coefficient; μ_{it} = Error term.

The econometric transformation of the above model is shown as follows:

$$LNCPS = \beta_0 + \beta_1 LNTBN + \beta_2 LNINT + \mu_{it}, \quad (2)$$

where LN = Natural Logarithm form of variables; CPS = Credit available to the private sector; TBN = Government total bond; INT = Borrowing cost; β_0 = Measurement of the factor guesstimate; $\beta_1 - \beta_2$ = Coefficients; μ_{it} = Miscalculation stint.

Table 1 provides information on the variables used for this study. The sample is taken from 1989–2021 from the sources indicated in *Table 1* below.

The universal ARDL (p, q) model is identified as follows:

$$Yt = Yoi + \sum_i^p = 1\ \delta i Yt - i + \sum_i^q = 0 \beta i\ Xt - I + \mu_{it}, \quad (3)$$

where Yt is a vector and the variables in (Xt) are allowed to be purely 1(0) or 1(1) or co-integrated; β and δ are coefficients; Y is the constant; $I = 1, \ldots, k$; p, q are optimal lag orders; μ_{it} is the vector of the error terms in unobservable zero mean white noise vector process (serially uncorrelated or self-determining). p lags represent the dependent variable while the q lags are used to denote the exogenous/independent variables.

Table 1

Variables Information

Name of Variable	Abbreviat-ion	Metric Measurement	Transformation Type	Source
Private Sector Credit	CPS	National currency (Naira)	Natural logarithm	Central Bank of Nigeria Statistical bulletin from 1989–2021
Government Total Bond	TBN	Local currency (Naira)	Natural logarithm	Central Bank of Nigeria Statistical bulletin from 1989–2021
Interest rate/ borrowing cost	INT	Percentage	Natural logarithm	World Development Indicators from 1989–2021

Source: Research output, 2023.

To perform the bound test for co-integration, the conditional ARDL (p, $q1$, $q2$) model with 3 variables is specified as shown below:

First of all, the following hypotheses apply:

$$H_0 : \alpha_1 = \alpha_2 = \alpha_3 = 0 \text{ (No co-integrating equation)}$$

$$H_1 : \delta_1 \neq \delta_2 \neq \delta_3 \neq 0 \text{ (H_0 is not true);}$$

where, α_1, α_2 and α_3 are coefficients to be estimated. The ARDL methodology used AIC to choose the best model and the appropriate length for the lag level.

Therefore, the specification for bound test include:

$$\Delta \ln CPS_t = \alpha_1 \ln CPS_{t-i} + \alpha_2 \ln TBN_{t-i} + \\ + \alpha_3 \ln INT_{t-i} + \ln CPS_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln CPS_{t-i} + \\ + \sum_{i=0}^{q_1} \alpha_2 \Delta \ln TBN_{t-i} + \sum_{i=0}^{q_2} \alpha_3 \Delta \ln INT_{t-i} + \mu_t. \quad (4)$$

For the purpose of this study ARDL is specified as follows:

$$\ln CPS_t = \alpha_0 + \sum_{i=1}^{p} \alpha_1 \Delta \ln CPS_{t-i} + \\ + \sum_{i=0}^{q_1} \alpha_2 \Delta \ln TBN_{t-i} + \sum_{i=0}^{q_2} \alpha_3 \Delta \ln INT_{t-i} + \mu_t. \quad (5)$$

DATA ANALYSIS AND INTERPRETATION

The data collected on the factors under study have been analyzed and explained in this section. Section 4 includes detailed analyses of the datasets and the results of the tests, which include descriptive statistics in *Table 1*, unit root results in *Table 2*, ARDL free estimation results in *Table 3*, ARDL bounds test results in *Table 4*, VAR Lag order selection criteria in *Table 5*, ARDL short-run estimation results in *Table 6*, test of multi-collinearity results in *Table 7*, serial correlation results in *Table 8*, and finally *Fig. 1–3* expressing the model's appropriateness.

Table 1 displays the descriptive statistics results, which show that the mean values of CPS, TBN, and INT are 7.47, 7.42, and 1.82, respectively. The standard deviations for the variables mentioned are 2.27, 1.64, and 0.88, respectively. This result indicates that the dispersion of the data is low when compared to the mean value, which is higher. However, the Jarque-Bera result, which indicates that the p-values are greater than 0.05, is used to confirm that the dataset has a normal distribution.

To avoid false regression analysis, statistical methods espoused that interconnected time series be differenced progressively before using models [37, 38].

Table 3 shows the free ARDL result that has not yet been subjected to a bound test for lag selection. At this point, we can confirm that private sector investment credit has a significant impact on private sector capital at lag 1. Similarly, interest rates at lag 2 have a significant impact

Table 2

Descriptive Statistics

Variables	Mean	Median	Max.	Min.	Std. Dev.	Skewness	Kurtosis	Jarque-Bera	No. of Observation
CPS	7.47	7.52	10.40	3.41	2.27	–0.65	1.75	2.63(0.27)	33
TBN	7.42	7.33	9.86	3.85	1.64	–0.31	2.20	1.39(0.49)	33
INT	1.82	1.89	3.45	0.00	0.88	–0.30	2.79	2.39(0.30)	33

Source: Author's calculation.

Table 3

Unit Root Test Result

Variables	ADF T–Statistic	Critical Value @ 5%	P–Value	PP T–Statistic	Critical Value @ 5%	P–Value	Order of integrat–ion	Remarks
lnCPS	–4.77	–3.56	0.00	–4.85	–3.56	0.00	1(1)	Stationary
lnTBN	–4.36	–3.56	0.00	–4.58	–3.56	0.00	1(0)	"
lnINT	–6.06	–3.56	0.00	–6.06	–3.56	0.00	1(0)	"

Source: Author's calculation.

Table 4

ARDL Unrestricted Estimation Result

Variable	Coefficient	Std. Error	t–Statistic	Prob.*
LNCPS(–1)	1.028969	0.093697	10.98184	0.0000***
LNTBN	–0.099930	0.139180	–0.717991	0.4794
LNINT	0.031128	0.032868	0.947053	0.3527
LNINT(–1)	–0.000234	0.034047	–0.006877	0.9946
LNINT(–2)	–0.103033	0.034140	–3.017955	0.0058***
C	0.905965	0.406380	2.229355	0.0350
Adj. R^2	0.994407			
S.E. of regressn	0.155873			
F-statistic	1067.674	Durbin-Watson stat.		1.976090
Prob(F-statistic)	0.000000			

Source: Author's calculation.

on private sector growth. The implication is that a steady flow of credit to the private sector and low interest rates will improve the country's private sector operations. It should be noted that government bonds and interest rates without lag and at lag 1 cause significant harm to private sector operations. As a result, crowding out of the private sector is inevitable and harmful to the economy when the government issues more bonds and raises borrowing costs through its monetary authorities.

The Autoregressive Distributive Lag (ARDL) model was utilized to study the relationship between state bonds and private sector investment. The Ardl bound testing, which was recommended by [39], was used to determine whether there is co-integration in the series. The appearance of co-

Table 5

ARDL Bounds Test Result

F-Statistic	Significance	I0 Bound	I1 Bound
2.92	10%	3.17	4.14
	5%	3.79	4.85
	2.5%	4.41	5.52
	1%	5.15	6.36

Source: Author's calculation, 2022.

Table 6

VAR Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	–10.99395	NA	0.153810	0.965100	1.106544	1.009398
1	10.89604	37.74135*	0.036454*	–0.475589*	–0.286996*	–0.416524*
2	10.95884	0.103947	0.038955	–0.410954	–0.175214	–0.337123

Source: Author's calculation.

Note: * Specifies interval direction carefully chosen by the gage.

integration presupposes that there is a long-run balance connection between the variables under consideration [40]. When the unit root test indicates different arrangements of interconnection and the sample size is relatively small, the bounds test is favorable [41].

The lesser and greater bound precarious standards are determined by the bounds test. The figured F-statistic ought to be greater than the high destined check to indicate that co-integration exists [42]. In the analysis in Table 4, the F-statistic of 2.92 is lower than both the lower bound 1(0) result of 3.79 and the upper bound 1(1) result of 4.85. Therefore, there is no long-run co-integration in the series, and H_0 of no long-run co-integration is true.

The outcomes of the ARDL bound test for selecting the most appropriate lags are shown in *Table 5*. The bound test is critical for validating optimum lag performance and achieving a more reliable and unbiased output while aiming to prevent multi — collinearity issues. *Table 5* demonstrates that the optimal lag to apply is one (1), which is backed by all metrics (LR, FPE, AIC, SC and HQ).

Having conducted the bound test as shown in *Table 4*, we were able to select the lag length, which all applicable criteria decided at l (see *Table 5*). Therefore, ARDL short-term estimation was conducted as displayed in *Table 6*. From the result in *Table 6*, the interest rate at lag 1 impacted the private sector at a 10% level of significance. It is important to note that government bonds have no significant impact on private sector operations. This result confirms that government bonds oppress the private sector and prevent it from getting sufficient credit facilities for operation.

The test of the interrelationship of predictor variables is conducted, and the result in *Table 7* indicates that there is no appearance of multi-colinearity of variables in this study. The VIF is less than both 4 [43] and 10 [44]. In *Table 8*, the serial correlation test result confirms the absence of autocorrelation, as indicated by the Durbin-Watson result in *Table 6*.

CUSUM and CUSUMSQ tests were conducted to ensure the model's reliability. This operation is employed to verify the long-run consistency of the regression coefficient. The thematic maps of CUSUMSQ (*Fig. 1*) and CUSUM (*Fig. 2*) can be seen below, and because the plots of these facts and figures continue to stay within the essential frontiers of the 5% level of significance, the Null hypothesis cannot be dismissed. Thus, it implies that the regression equation is unwavering and suitably stated. As a result, these figures show the long-run solidity of the parameters applied in this research. The consistency of each parameter was also checked, and the recursive estimate graph in *Fig. 3* clearly

Table 7

ARDL Short-term estimation result Dependent Variable: D(LNCPS)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNCPS(−1))	0.258987	0.174057	1.487940	0.1484
D(LNTBN(−1))	0.047088	0.223226	0.210943	0.8345
D(LNINT(−1))	0.047476	0.025033	1.896558	0.0686**
C	0.156309	0.063335	2.467972	0.0202
S.E. of regression	0.176394			
F-statistic	2.008065	Durbin-Watson stat		1.844155
Prob(F-statistic)	0.006537			

Source: Author's calculation.

Table 8

Test of Multicolinearity

	Coefficient	Uncentered	Centered
Variable	Variance	VIF	VIF
C	0.004011	3.996483	NA
D(LNCPS(−1))	0.030296	2.484793	1.006039
D(LNTBN(−1))	0.049830	2.788174	1.031915
D(LNINT(−1))	0.000627	1.027303	1.027275

Source: Author's calculation.

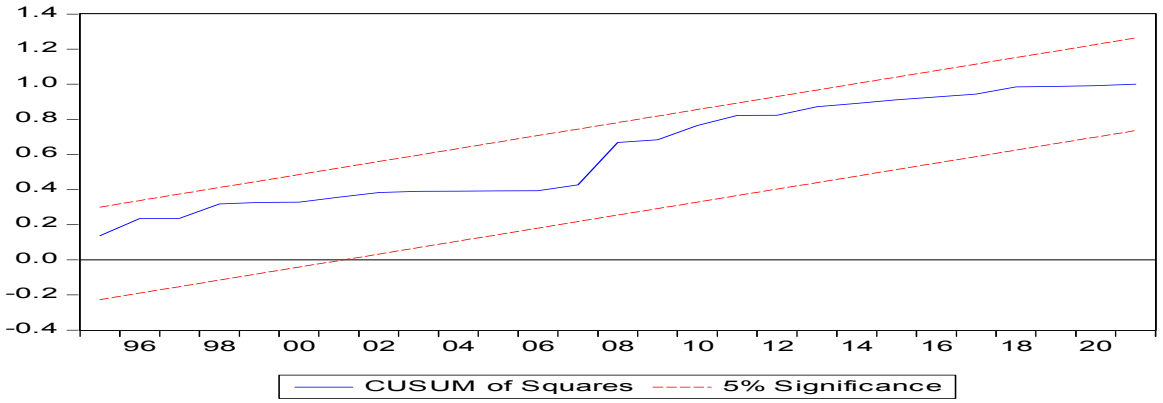

Fig. 1. **Cumulative Sum of Squares**

Source: Research output from e-view 10.

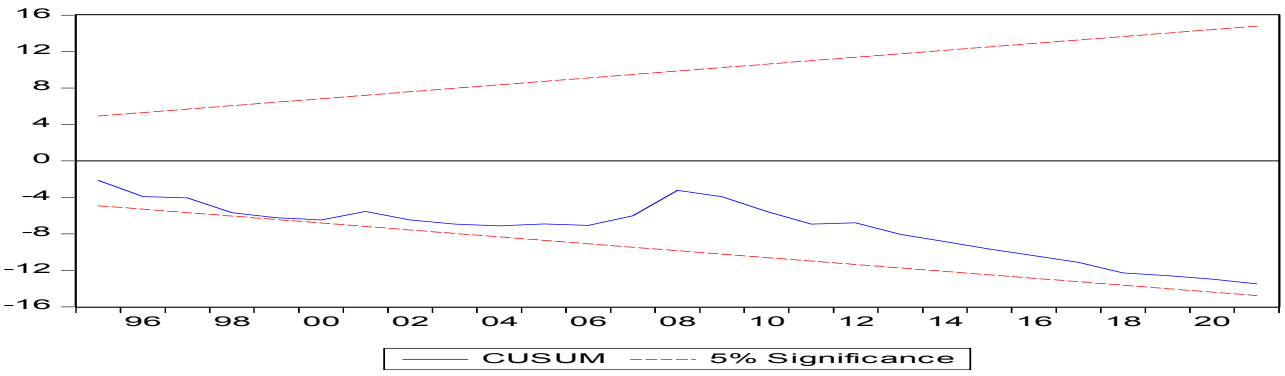

Fig. 2. **Cumulative Sum**

Source: Research output from e-view 10.

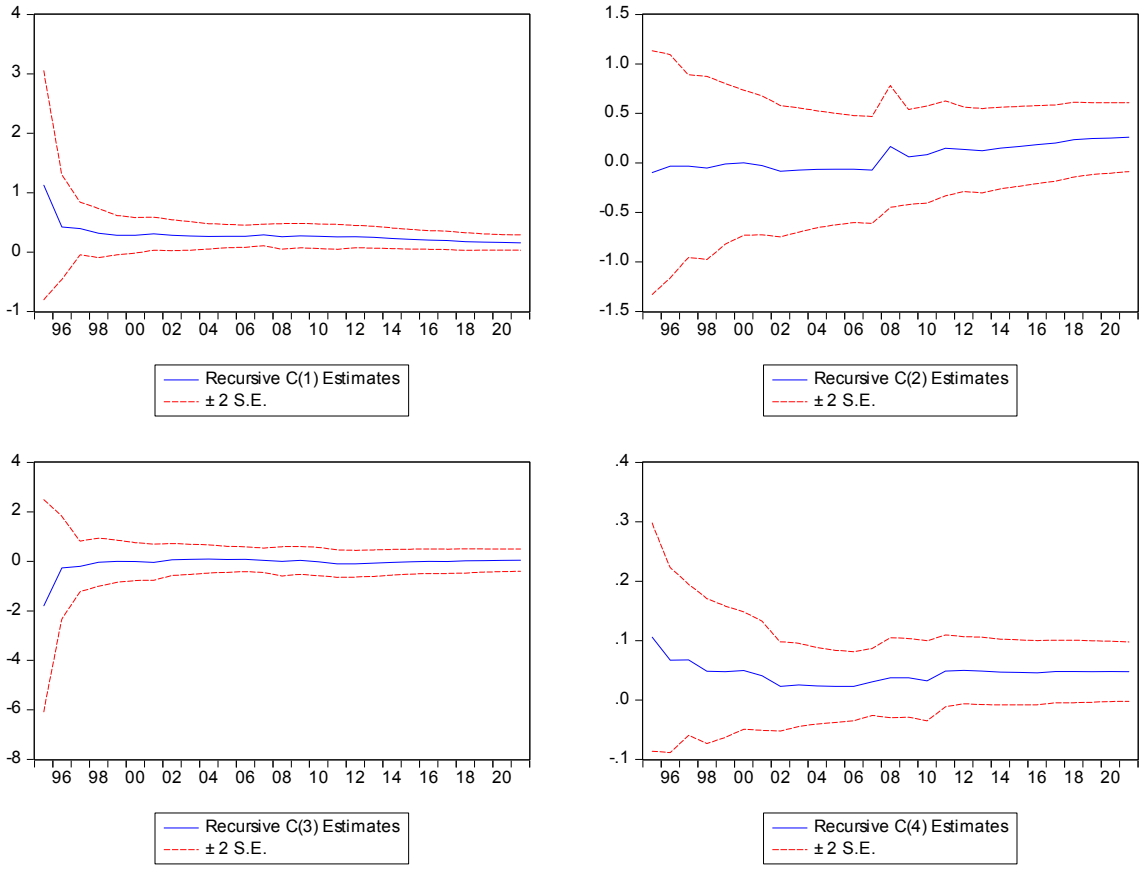

Fig. 3. **Recursive Estimates**

Source: Research output from e-view 10.

shows that the statistics are within the threshold point at the 5% level of significance, inferring that all coefficients in the model are constant. As a result, the chosen output model can be used to inform policy decisions.

CONCLUSION AND RECOMMENDATION

The investigation focused on the impact of government bonds on private sector operations, which is very much dependent on the amount of credit available to the private sector for investment. We evaluated a lot of previous works on the effect of government domestic borrowing both on the economy at large and on the private sector; however, the results were inconclusive, implying that government borrowing domestically has both harmful and beneficial effects on the economy. Thus, the emergence of this current study has proved

that if care is not taken, government borrowing may likely force the private sector out of business in Nigeria. The fiscal implication of this scenario is that there will be massive unemployment and economic chaos because the economy will be harmed and the government sector will not be able to absorb the shock. The private sector has been a significant contributor to Nigeria's economic growth and productivity, and it requires adequate funding to continue operating at full capacity. Furthermore, the private sector has made significant contributions to the production of goods and services, as well as human capital development and job creation. The private sector in the country is responsible for the majority of exports and international trade. For the government, the private sector contributes to the generation of tax revenue for social development. Firms' capital structures include debt issuance, which is necessary for firms to take advantage of investment opportunities, maximize growth, and boost after-tax earnings [[45]. Therefore, the study suggests that the federal government formulate strategies to regulate government domestic borrowing and rates of interest, as well as measures to facilitate financial growth by boosting SME access to low interest credit facilities, in order to promote private sector investments in the country. There is a need for further studies in other Sub-Saharan African countries, as this study is limited by a lack of data to cover other countries in Africa.

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