Original Research Article

Pairwise Dynamics among Government Expenditure, Debt and Economic Growth in Nigeria

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Abstract

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The increased borrowing in the midst of dwindling economic progress with a huge spending paradox is the trust of this study. The study examined the nexus between economic growth, government expenditure, and debt in Nigeria. Can fiscal spending have a causal link with the nation's progress path is the crux of this study? The study used data from 1981 to 2020 with VAR pairwise granger causality analysis. The finding showed a substantial positive link between government capital and recurrent spending and public debt in the Nigerian economy. The Wald test result demonstrates that there is a unidirectional causal relationship between state debt in Nigeria and both capital and recurrent expenditures. This illustrated the apparent inference that Nigerian government borrowing is caused by budget deficits, a circumstance that is well-known in Nigeria at both the federal and state levels. The conclusion from the study is that debt informed the consistent deficit spending in the country. The policy recommendation is that government should assess its fiscal behaviour to reduce borrowing and prudent management of resources in the country.

Keywords: Allocative efficiency, Causality, Fiscal policy, Government capital expenditure, Government recurrent expenditure, Public debt, Zero based budgeting

INTRODUCTION

Is it true that borrowing informed spending in most less-developed countries like Nigeria? like the bulk of the world's most indebted and helpless countries, has slow economic development and low per capita income, as well as insufficient domestic investment money to meet educational and other public goals. Nigerian commodities were mostly essential wares, with trade profit margins too low to consider financing imports, which are frequently capital-intensive (made) goods that are also more expensive. Nigeria's move to a mono-economy as a result of oil discoveries is compounding the situation. The oil sector accounts for around 95% of international trade income and approximately 80% of monetary income. Because of her failure to diversify her revenue sources, as well as debasement and blunder, Nigeria lacks assets

for expansion and formative enterprises, such as streets, power pipe-borne water, and so on. Governments borrow when their revenues fall short of their expenditures. Thus, public debt is an important weapon for governments to use to pay public spending, especially when raising taxes and cutting spending is difficult. This method has resulted in large outstanding debts for most governments throughout the years. Reasonable borrowings to fund public and infrastructure development are critical to accelerating economic growth. However, excessive borrowing without proper investment planning can result in a hefty debt load and interest payments, which can have a number of negative repercussions on the economy (Joy & Panda, 2020). High public debt is also a crucial issue for nations with weak economic structures

since it can lead to instability and low economic growth. Investors are particularly concerned about high debt-to-GDP ratios because they might have an adverse impact on the stock market and hinder long-term investment and employment in productive activities (Saungweme et al., 2019). Therefore, while public debt may be an economic stimulant, when it reaches very high levels, a sizeable amount of government spending and foreign exchange gains will go into servicing and repaying the debt, which will have a significant impact on future generations. Furthermore, the cost of debt payment may rise faster than the economy can bear, which would undermine attempts to achieve targeted fiscal and monetary policy goals.

Government recurrent expenditure (debt and non-debt) remained high and in accordance with budgetary objectives despite the income deficiencies seen, but the crucially required capital investment continued to suffer a significant drop during the past 20 years. Questions about Nigeria's economy's viability are raised by the country's ongoing decline in income. Government income, particularly those derived from sources other than oil, may continue to decline for a long time due to the economy's anticipated trajectory toward COVID-19 and the recession that increased insecurity has caused. Because of this, Nigeria's debt service to revenue ratio would continue to be under strain since the government will still need to borrow money to pay for its activities.

According to the notion of the liquidity crisis, investment decisions may be impacted when debt is returned and service payments are made. When nominal debt is this high, debt repayment takes up resources that could be invested in the economy. Since public investments are often modest, this is worse for a nation with low levels of income. Public investments are determined by budgetary expenditures and tax revenues. The depreciation of currency rates promotes the repayment of external debt. Export revenues are used to pay off foreign loans, and a declining exchange rate promotes exports. Therefore, for a nation with a net export surplus, depreciation of currency rates is anticipated to assist in the repayment of foreign loans. Given the issues raised above, this paper seeks the pairwise dynamics of government expenditure, debt and economic growth in Nigeria. The paper is organized as follows. Section one is the introduction, while section two contains literature review and theoretical framework. Section three consists of methodology and model estimation, while section four contains discussion of results. Section five is for recommendations and conclusion.

LITERATURE REVIEW

Government expenditure is the most significant policy instrument for encouraging growth and equal distribution in the majority of developing nations throughout the world. In most of these nations, it is commonly understood that government spending is utilized to increase technology, human resources, and infrastructure development, as well as providing incentives and an enabling environment for private sector investments to accelerate growth. Government expenditure refers to how much money the government spends via taxes, levies, and other sources of revenue. Government expenditure on various areas has varying levels of effectiveness in terms of economic growth (Yusuf et al. 2015). Meanwhile, the two opposing viewpoints on government expenditure as defined by fiscal policy must be addressed.

Public debt is the sum that an economy owes to lenders outside of itself. These organizations might be made up of individuals, groups, and various governments. Public debt and sovereign debt are commonly used in the same sentences (Kimberly, 2016). The entire sum due to municipal, state, and federal governments is referred to as a country's "public debt," which illustrates the extent to which public expenditure is supported by borrowing as opposed to taxation (Makau, 2008). The amount of money owed by the government to institutions, agencies, and other authorities both inside and outside of Nigeria is known as its public debt. The unique importance of debt, both internal and external, has also come under scrutiny as a result of the financial crisis (Nzotta, 2004; Hassan and Akhter, 2012).

Spending also helps to economic growth and social development through a variety of routes; for instance, expenditures in agricultural and industrial infrastructure foster links across sectors and open up job opportunities. Similar to this, investing in health and education may increase labor force productivity and contribute to economic growth. A wide range of literature has been written about how public debt affects financial development and, most crucially, economic growth in both developed and developing countries (Eberhardt and Presbitero, 2015; Nantwi and Erickson, 2016; Stylianou, 2014). Across all countries, there is a complicated and unique relationship between spending, debt, and economic growth. The link between spending, debt, and economic growth is investigated in a number of research using various econometric techniques.

According to economic theory, a developing nation's ability to borrow at affordable rates would certainly help it thrive economically. Early-stage developing nations tend to have limited capital stocks and provide investment possibilities with greater rates of return than more developed nations. As noted by Pattillo et al. (2004), growth should increase and enable prompt debt repayment as long as these countries employ the borrowed money for productive investment and do not experience macroeconomic instability, policies that distort economic incentives, or significant unfavorable shocks.

When mercantilists were in power, economists favored debt. As time went on, the government's influence decreased. This was the viewpoint of the economist who backed the Laissez Faire policy by adhering to classical theory. This philosophy believed that the only organization capable of maintaining law and order was the government. According to this idea, economists supported full employment, factor mobility, and perfect competition. According to this idea, spending by the government is ineffective. Additionally, it claims that the burden placed on society by governmental debt is unwarranted. Later, Adam Smith opposed the mercantilist system, and the Laissez Faire was born (Alesina and Tabellini, 2007). According to this idea, public debts are ineffective because they burden the society with high interest costs.

We looked at the theoretical justifications for debt from the Classical, Ricardian, Keynesian, and endogenous development models. The Classicals viewed debt as a capital injection that should be used to business ventures rather than to individual consumers' needs (Modigliani, 1961). This implied that ways of collecting funds and failing to pay according to their terms should not be used to finance government expenditures. Additionally, it is important to deal with the present debt obligation in a timely and efficient manner (Masoga, 2018). The high credibility of monetary policy restrictions and the associated difficulties they may experience in light of the composition and extent of debt remained a source of worry.

The advantages of capital growth for society have made Ricardo's preference for tax-financed government spending over public debt acceptable. Churchman (2001) cites Ricardo's argument that using the public debt to pay for government spending during a war, for instance, would have serious effects on the economy after the conflict. This is only due to the fact that tax would need to be levied in order to pay the growing debt. According to Ricardian's equivalence, future increases in taxation over the usual level are the result of the government borrowing it is doing now (Modgliani, 1961). In turn, this would neutralize the impact of public debt on economic growth.

In their 2007 study, Olugbenga and Owoye look at the link between government spending and economic development for a group of 30 nations between 1970 and 2005. The results demonstrate a long-term link between government spending and economic expansion. In ten of the nations, the causal relationship between economic growth and government spending has also been established, supporting Wagner's law.

Using an econometric model using the Ordinary Least Square (OLS) approach, Muritala and Taiwo (2011) performed research to investigate the impacts of government expenditure on the growth rate of real gross domestic product in Nigeria. The outcome demonstrates that real GDP and both recurrent and capital expenditures have a positive connection.

Egbetunde (2012) examined the relationship between Nigeria's public debt and economic development using the vector autoregressive approach and yearly data from 1970 to 2010. The results of the VAR model showed that Nigeria's economic growth and its broken-down components of public debt are causally related in both directions. The study did not include any control variables and was based on data whose findings could have been affected by recent changes in the government debt situation. Using the Solow-Swan growth model enhanced for debt, Babu et al. (2015) investigated the impact of domestic debt on economic development in East African nations over the 1990–2010 period. The panel fixed-effect model was chosen and adjusted for heteroscedasticity using the Hausman specification test.

Paul (2017) looks at how Nigeria's foreign debt is affecting the economy there. For the purpose of the review, information is gathered from auxiliary sources. Some of the variables considered when gathering data include the ones listed below: GDP, external debt managements, an external debt stock, an external savings, and a conversion scale. The study's time frame is from 1985 to 2015. The data are analyzed using the ordinary least square regression, ADF unit root test, Johansen cointegration, and error rectification tests. According to research, foreign debt stock has a significant and favorable influence on Nigeria's growth list, but debt management installment has a negligible impact on that list. External saving and scale shifting are two control mechanisms that have a positive and critical influence on growth. The ADF unit root test demonstrates that none of the components are fixed at their original levels. The Johansen cointegration test demonstrates a long-term relationship between foreign debt and growth (GDP). It also demonstrated that the components' connection is governed by anything resembling a single normal stochastic pattern. The causality test demonstrates that external debt and GDP are unidirectionally connected.

Sulaiman and Azeez (2012) examine the effect of external debt on the economic growth in Nigeria using econometric techniques of Ordinary Least Square (OLS) Augmented Dickey Fuller (ADF) Unit Root test, Johansen co-integration test and Error Correction Method (ECM) and found that external debt has contribute positively to the Nigerian economy. Ezeabasili, Isu and Muojekwu (2011) investigate the relationship between Nigeria's external debt and economic growth between 1975 and 2006 applying econometric analyses. The finding shows that external debt has negative relationship with economic growth in Nigeria.

Eboigbe and Idolor (2013) examine the impact of external debt on public sector investment in Nigerian economy, using the co-integration economic technique on annual time series data for 31 years (1980 – 2011) to test the hypothesized relationship. The result of the

study shows that there is a positive relationship between external debt and public investment, meaning that an increase in debt stock will lead to increase in capital expenditure and public investment in turns. The paper recommends that Nigeria should be concerned about the absorptive capacity of the economy before embarking on more external debt acquisition; and that the portfolio of debt should be diversified in terms of sources and types to avoid concentrations of debt service imperatives.

Oyinlola and Akinnibosun (2013) examine the relationship between public expenditure and economic growth in Nigeria for the period of 1970 to 2009. Using the Gregory-Hansen structural breaks cointegration technique, and employing a disaggregated public expenditure level, the study confirms Wagner's law in two models in the long run. The long run elasticity results showed that economic growth does not translate to growth in recurrent expenditure, administrative expenses and transfer expenditures. The result also shows that economic growth leads to growth in capital expenditure as well as in social community service. The study recommended that efforts should be geared towards maintaining adequate level of investment in social and economic infrastructure.

The findings of Didia and Ayokunle were different from the findings of Favour et al.. The study of Didia and Ayokunle revealed a long run statistically significant positive relationship between domestic debt and economic growth, while external debt revealed a statistically insignificant negative relationship with economic growth.

The empirical analysis of the data covering 1980 to 2016 was done using the Vector Error Correction Model and they concluded that domestic debt was more beneficial to economic growth in Nigeria than external debt. They recommended that the government should be mindful of the domestic and external debt mix in Nigeria's debt portfolio. Analysis of the impact of public debt on economic growth in Nigeria by Michael et al. saw the use of multiple regression analysis, autoregressive distributed lag and Chow breakpoint test. From the results, external and domestic debt had negative effects on GDP, but only the effect of external debt on GDP was significant. The study recommends that external debt should not be used to finance budget deficits.

METHODOLOGY

The time series data for the Gross Domestic Product (GDP), Capital Expenditure (CAPEXP), Recurrent approach (Anderson et al., 1986; Blackley, 1986; Ram, 1988). We follow the work of Miller and Russek (1990) and Jones and Joulfaian (1991), who used cointegration and Vector Autoregressive approaches to investigate the same subject. The Augmented Dickey-Fuller (ADF) test

was used to analyze the time series data's stationarity qualities.

The cointegration test of Johansen (1987) is used to assess if a set of non-stationary time series variables employed in this study is cointegrated or not. Finally, using a Vector Autoregressive based causality test, the direction of causation for the hypotheses is investigated. The functional connection is as follows, using the Keynesian definition of aggregate output: The functional representation of the model is as follows;

$$GDP = f(RECEXP, CAPEX, DEBT) \text{ --------------- eqn 1}$$

The multiple linear regression equation is stated in Eqn 2 as follows;

$$LNGDP = \beta o + \beta 1 RECEXP + \beta 2 CAPEXP + \beta 3 DEBT + \mu \text{ ----------- eqn 2}$$

Taking the natural log of equation 2 we have;

$$LNGDP = \beta o + \beta 1 LNRECEXP + \beta 2 LNCAPEXP + \beta 3 LNDEBT + \mu_t \text{ ------- eqn 3}$$

The general error correction model adoption for this study is;

$$\Delta LNGDP = \beta o + \beta 1 \Delta LNRECEXPt + \beta 2 \Delta LNCAPEXPt + \beta 3 \Delta LNDEBT + ECM_{t-1} + \mu_t \text{ --------eqn 4}$$

Using Vector Autoregressive model, below are the VAR models with four Variables;

$$Incapexp_t = \alpha + \sum_{i=1}^{k} \beta_i Incapexp_{t-i} + \sum_{j=1}^{k} \emptyset_j Inrecexp_{t-j} + \sum_{m=1}^{k} \varphi_m Indebt_{t-m} + \sum_{n=1}^{k} \theta_n Ingdp_{t-n} + \mu_{1t}$$

$$Inrecexp_t = \sigma + \sum_{i=1}^{k} \beta_i Incapexp_{t-i} + \sum_{j=1}^{k} \emptyset_j Inrecexp_{t-j} + \sum_{m=1}^{k} \varphi_m Indebt_{t-m} + \sum_{n=1}^{k} \theta_n Ingdp_{t-n} + \mu_{2t}$$

$$Indebt_t = \vartheta + \sum_{i=1}^{k} \beta_i Incapexp_{t-i} + \sum_{j=1}^{k} \emptyset_j Inrecexp_{t-j} + \sum_{m=1}^{k} \varphi_m Indebt_{t-m} + \sum_{n=1}^{k} \theta_n Ingdp_{t-n} + \mu_{3t}$$

$$Ingdp_t = \delta + \sum_{i=1}^{k} \beta_i Incapexp_{t-i} + \sum_{j=1}^{k} \emptyset_j Inrecexp_{t-j} + \sum_{m=1}^{k} \varphi_m Indebt_{t-m} + \sum_{n=1}^{k} \theta_n Ingdp_{t-n} + \mu_{4t}$$

Where;

GDP = Gross Domestic Product, RECEXP = Total Government Recurrent Expenditure, CAPEXP = Total Government Capital Expenditures, DEBT = Total public debt

$\beta_0, \beta_1, \beta_2, \beta_3$ = Regression Coefficients, μ_t = Error term or stochastic term

RESULT AND DISCUSSION

Unit Root test

The Augmented Dickey-Fuller (ADF) technique is used to investigate data stationarity in this study. A choice is taken to reject the null hypothesis that the variable has a unit root at a 5% level of significance. The stationarity of the underlying variables is evaluated using Table 1. At their starting disparities, GDP, Capital Expenditure (CAPEXP), Recurrent Expenditure (RECEXP), and Debt

Table 1. Unit root result

Variables	ADF (5% critical value) at Level	ADF (5% critical value) at 1st Diff	Order of Integration
GDP	-1.527449(-2.941145)	-3.131808(-2.941145)	1(1)
CAPEXP	-1.083606(-2.938987)	-6.356934(-2.941145)	1(1)
RECEXP	-1.567347(-2.941145)	-8.393704(-2.941145)	1(1)
DEBT	-1.526344(-2.941145)	-4.792763(-2.941145)	1(1)

Source: Extractions from E-views 10.0 Output Generation

Table 2A. Cointegration analysis 1981-2020 (Unrestricted Coint Rank Test (Trace)

Hypothesized		Trace	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.442400	42.90782	47.85613	0.1348
At most 1	0.249010	20.71152	29.79707	0.3759
At most 2	0.172377	9.829727	15.49471	0.2941
At most 3	0.067120	2.640202	3.841466	0.1042

Table 2B. Results of Johansen Co-integration Test Based on Eigen Value (Maximum Eigenvalue)

Hypothesized		Max-Eigen	0.05	
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.442400	22.19630	27.58434	0.2105
At most 1	0.249010	10.88179	21.13162	0.6591
At most 2	0.172377	7.189525	14.26460	0.4670
At most 3	0.067120	2.640202	3.841466	0.1042

Source: Authors' Own Computation using Eviews 10

(DEBT) all stay unchanged. This indicates that the variables lack a unit root. GDP, CAPEXP, RECEXP, and DEBT, respectively, are characterized as 1(1), 1(1), 1(1), and 1(1).

Johansen Co-Integration Test

The next step is to seek for co integration between the variables once each time series has been validated for stationarity. To assess if the variables have a long-term relationship, the Johansen technique is applied. The co-integration of the dependent and independent variables provides a dynamic foundation for forecasting. The null hypothesis is rejected only when the trace test statistics above the critical threshold.

The important value is bigger than the trace statistic. However, we are unable to reject the null hypothesis, which states that there is no co-integration among the variables, with just one, two, or three proposed co-integrating equations. Because the trace test is more powerful than the max eigenvalue test, there is only one co-integrating vector. The VAR model will be calculated as a consequence.

Table 2a and table 2b shows the results of the john co-integration test using the trace statistic. A minimum of one, a maximum of two, and a maximum of three. The null hypothesis is accepted since the trace statistic value is less than the essential value. There is no co-integration since the trace statistics value is smaller than the significant value. Because the data show that there is no long-term relationship between the variables, the null hypothesis is accepted.

RESULT PRESENTATION

If the p-value of a variable is higher than 5%, we cannot reject null hypotheses; instead, we accept null hypotheses; if the p-value is less than 5%, we reject null hypotheses and accept alternative hypotheses in the VAR Granger Causality/Block Exogeneity Wald Tests.

The first table's independent variable is LGDP, whereas the second table's independent variables are LCAPEXP, LRECEXP, and LDEBT, as shown in Table 3. We cannot reject null hypotheses because the p-values for LCAPEXP and LRECEXP are more than 5%, thus we must accept them. We reject null hypotheses

Table 3. VAR Granger Causality/Block Exogeneity Wald Tests

Dependent variable: LGDP			
Excluded	Chi-sq	df	Prob.
LCAPEXP	1.412219	1	0.2347
LRECEXP	2.213179	1	0.1368
LDEBT	7.885245	1	0.0050
All	17.23019	3	0.0006
Dependent variable: LCAPEXP			
Excluded	Chi-sq	df	Prob.
LGDP	5.762648	1	0.0164
LRECEXP	1.989477	1	0.1584
LDEBT	4.815922	1	0.0282
All	10.98583	3	0.0118
Dependent variable: LRECEXP			
Excluded	Chi-sq	df	Prob.
LGDP	1.318486	1	0.2509
LCAPEXP	0.146137	1	0.7023
LDEBT	2.401513	1	0.1212
All	5.735341	3	0.1252
Dependent variable: LDEBT			
Excluded	Chi-sq	Df	Prob.
LGDP	0.113078	1	0.7367
LCAPEXP	0.376604	1	0.5394
LRECEXP	0.017317	1	0.8953
All	0.609769	3	0.8942

Source: Authors' Own Computation using Eviews 10

Table 4. Pairwise Granger Causality Tests

Null Hypothesis:	Obs	F-Statistic	Prob.
LCAPEXP does not Granger Cause LGDP	38	1.11173	0.3410
LGDP does not Granger Cause LCAPEXP		6.23493	0.0050
LRECEXP does not Granger Cause LGDP	38	4.75718	0.0153
LGDP does not Granger Cause LRECEXP		0.21754	0.8056
LDEBT does not Granger Cause LGDP	38	3.36676	0.0467
LGDP does not Granger Cause LDEBT		1.62705	0.2119
LRECEXP does not Granger Cause LCAPEXP	38	1.34245	0.2751
LCAPEXP does not Granger Cause LRECEXP		1.19102	0.3166
LDEBT does not Granger Cause LCAPEXP	38	5.66243	0.0077
LCAPEXP does not Granger Cause LDEBT		0.50374	0.6088
LDEBT does not Granger Cause LRECEXP	38	2.11764	0.1364
LRECEXP does not Granger Cause LDEBT		0.53379	0.5914

and accept alternative hypotheses since the p-value for LDEBT is 00.50 percent, which is less than 5%.

In the second Table 4, LCAPEXP is the dependent variable, whereas LGDP, LRECEXP, and DEBT are the independent variables. We reject null hypotheses and accept alternative hypotheses since the p-values for LGDP and LDEBIT are less than 5% at 01.64 percent and 02.82 percent, respectively. However, given the p-value for LRECEXP is more than 5%, we cannot reject null hypotheses and must instead accept them.

In the third table, the dependent variable is RECEXP, and the independent variables are LGDP, LRECEXP, and DEBT, with p-values of 25.09 percent, 70.23 percent, and 12.12 percent, respectively, all of which are more than 5%, indicating that we cannot reject null hypotheses for the variables.

In the fourth table, the dependent variable is DEBT, and the independent variables are LGDP, LRECEXP, and CAPEXP, with p-values of 73.67 percent, 53.94 percent, and 89.53 percent, respectively, all of which are

greater than 5 percent, indicating that we cannot reject null hypotheses for the variables.

The table 4 above shows the results of pairwise Granger causality between GDP, capital expenditure, recurrent spending, and debt. The research demonstrates that the null hypothesis that capital spending has no influence on real GDP cannot be safely rejected at any significant level. This indicates that the Granger Causality between GDP and Capital Expenditure is one-way. The result of the second null hypothesis, that recurrent expenditure does not Granger Cause GDP, is rejected at a 1% level. It also shows that debt has no effect on GDP growth. This shows that recurrent spending drives economic growth, but that bidirectional causality leads recurrent spending to drive capital investment and vice versa.

CONCLUSION

In Nigeria from 1981 to 2020, this study examined the causal link between total state debt and expenditures. The goal of the study is to ascertain whether government borrowing in Nigeria is driven by the need to fund social services and infrastructure, as specified in the budget, or merely by the benefit of preferential access to financial institutions on a domestic and global scale, as suggested by Adam Smith (1776) in his theory of public debt. The study's econometric analytical methods of co integration, vector error correction model, and Wald testing produced the following findings. The trace statistics shows two (2) co-integration equations at a 5% level of significance, indicating that the variables evaluated have a long-term relationship and that the results may be trusted for making long-term economic policy decisions. The results of the VAR test show a substantial positive association between government capital and recurrent spending and public debt in the Nigerian economy. The Wald test result demonstrates that there is a unidirectional causal relationship between Nigeria's state debt and both capital and recurrent expenditures. This conclusion has the apparent inference that Nigerian government borrowing is caused by budget deficits, a circumstance that is well-known in Nigeria at both the federal and state levels. In order to ensure that our budgeting system achieves allocative efficiency and that borrowing to finance budget deficits must be done objectively and realistically, it becomes important to reassess the government budgeting process. As a result, this study suggests that planning-programming budgeting systems (PPBS) and zero-based budgeting (ZBB) be implemented instead of the global standard of incremental budgeting (IB) in public finance at the federal and state levels. This is because these budgeting approaches aim to increase competition for budgetary resources.

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