HOW SUSTAINABLE IS FISCAL POLICY IN NIGERIA?

Abstract

The rise in public debt has heightened fiscal sustainability challenges, with the potential of throwing countries into the risk of committing costly mistakes of accumulating public debt to unsustainable levels. The paper determines the extent of fiscal sustainability in Nigeria between 1981 and 2022 by comparing the existing level of the fiscal spending with the resources to pay it off. A technique of Dynamic Ordinary Least Squares (DOLS) is used to test for existence or otherwise of fiscal sustainability based on the inter-temporal budget constraint (IBC) and the results reveal a weak fiscal policy sustainability for Nigeria. It is recommended that the Nigerian government should ensure a reasonable cut in her frivolous spending so as to reduce the country's continuous rise in debt profile. This is to enhance a higher level of fiscal sustainability for the African largest economy to ensure a more robust and systemic link between tax and expenditures policies that will not engender sustainable growth and development.

Keywords: Debt, Expenditure, Revenue, Fiscal sustainability, DOLS, Nigeria

1.0 Introduction

The pace of public debt accumulation in most Sub-Saharan African (SSA) countries following the efforts of Multilateral Debt Relief Initiatives (MDRI) and Debt Service Suspension Initiative (DSSI) to relieve Highly-Indebted Poor Country (HIPC) of ~~burden~~ debt burdens to hasten their growth and development presents debt sustainability concerns. In recent times, total public debt in Sub-Saharan Africa (SSA) has increased from 26.5% of GDP in 2009 to 56.3% in 2022 (IMF, 2023). This may not be unconnected with the improved macroeconomic performance, the deepening of domestic financial markets in some SSA countries supported by favourable international commodity prices which has continued to pave way for higher creditworthiness of the region and the growing lending activities of non-Paris Club countries (IMF, 2015). At the same time, new borrowing opportunities have emerged as a result of the accommodative liquidity conditions in international capital markets.

The speedy rise in public debt has heightened debt sustainability challenges, with potential of throwing countries into the risk of committing costly mistakes of accumulating public debt to unsustainable levels (IMF, 2023). The challenge has been exacerbated by the change in debt

Commented [ODG1]: Debt service to GDP is a better indicator for measuring sustainability levels of a country's debt profile. You also alluded to this in your abstract and this should underpin your analysis in this paper. *See*, Daniel Olika, 'Legal and Economic Perspectives to Sustainable Sovereign Debt Management in Nigeria: Energy Poverty in Perspective,' (2021) 12(1) The Journal of Sustainable Development Law and Policy, 111 – 136.

Commented [ODG2]: What's the basis ad authority for this assertion that positive economic conditions occasioned an increase in debt profile?

management framework, which is now tilted towards non-concessional borrowing from non-Paris club creditors as opposed to concessional loans from international financial institutions and bilateral Paris Club creditors which countries have traditionally relied upon. Also, the recent developments on the financing landscape where an increasing number of countries in SSA are accessing international capital markets has potential of worsening the situation. In addition, the deteriorating macro-financial factors such as falling economic growth rates, depreciating domestic currencies and increase in interest rates have also exacerbated the debt dynamics. All these may lead to excessive debt accumulation with its attendant huge debt service obligations and a constraint on economic growth which may become a burden to future generations (Chiang and Moss, 2020).

In an attempt to shed light on the difference and the relationship between fiscal sustainability and fiscal space, Heller (2007) as corroborated by Chalk and Hemming, (2000) posits that fiscal sustainability is typically bound to exist when the expected government revenue flow is adequate to finance future expenditure requirements and equally payback its existing stock of public debt. While considering fiscal sustainability, it is necessary to reconsider issues of debt sustainability, since the nature of government expenditure is made up of constructive budget obligations and it is liable to other potential fiscal risk and elasticity of government revenue (Hemming and Chalk, 2000, Baldacci and Fletcher, 2003, Heller, 2005, and (Ostry, Ghosh, Kim, Gureshi, 2010).

Prior to the debt relief of 2005, foreign debt constituted the larger part of the total debt in Nigeria. In the early 1970s, Nigeria's foreign debt was below 1billion dollar; by 1980s, 1990s and 2020s it had raisen to 3.4billion, 33billion and 40billion dollars respectively (DMO, 2021). Also, Nigeria has a total debt of 25 trillion naira or 103.11 billion dollar as at December 2022 as disclosed by the Debt Management Office (DMO, 2022). According to the DMO, the new figure is made up of the domestic and external total debt stocks of the Federal Government and the sub-national governments (36 state governments and the Federal Capital Territory). Nigeria's debt stance calls for empirical investigation as a result of continuous increase in her debt profile with its attendant huge debt servicing and the poor macroeconomic performance. For instance, the economy is marred by reduced export earnings, low level of savings and investment, chronic unemployment, rising rate of inflation and interest rate, dependence on foreign technology, monoculture foreign

Commented [ODG3]: Again to emphasise the problems with the increasing debt profile here, these figures should be put against the debt servie obligations of the government. This is because the figures alone tell so little about debt sustainability in Nigeria.

exchange earnings from crude oil, and many more. These problems have brought about a rapid decline in economic growth and the standard of living of people in Nigeria.

Against this backdrop, this paper seeks to determine the extent of fiscal sustainability in Nigeria by comparing the existing level of the fiscal spending with the available streams of resources to pay it off. This is done to ascertain the degree of fiscal consolidation in the largest African economy to contain increases in public debt. A deeper understanding of public debt dynamics and how governments respond to restore fiscal sustainability is critical for assessing risks to sovereign debt. The analysis is built on the work of Polito and Wickens, (2015), who investigated changes in fiscal policies and deficits following increases in public debt in the United States.

2.0 Literature Review

It is pertinent to emphasize that the majority of empirical research on the sustainability of different countries' fiscal policies is based on the rationale of either accounting or the present value budget constraint model. For instance, Oshikoya and Tarawahie (2020) examined the West African Monetary Zone's fiscal policy sustainability from 1980 to 2018. Investigation was done on annual data for Ghana, Nigeria, Sierra Leone, and the Gambia. The findings of the study demonstrated that, with the exception of Sierra Leone, other nations with unsustainable budgetary policies had little sustainability. Additionally, the findings of the causality tests confirmed the tax-and-spend hypothesis in Sierra Leone, Gambia, and Guinea, although bi-directional causation was present in the cases of Ghana and Nigeria.

Similar to this, Kuncoro, (2021) looked into the Indonesian government's fiscal budget's sustainability. His empirical estimates were based on unit root, cointegration, and VAR econometric techniques. The results demonstrated a high level of fiscal sustainability of Indonesia's economy. Similarly, Jibao Schoeman and Naraidoo (2022) investigated system variables and the sustainability of fiscal policy for South Africa. The analysis found that fiscal policies have been in line with the inter-temporal government budget limit after analyzing the asymmetries between government spending and revenue.

The Nigeria's fiscal stance in light of its overall economic performance indicates weak sustainability (Saibu, 2018). Similarly, the results regarding the relationship between budgetary sustainability and economic performance show a weak reaction from the latter. Overall, the data

Commented [ODG4]: Given that this study is about sustainable debt profile in Nigeria, the research in the literature that analyses Nigeria's fiscal policy and its debt management/ sustainability that should be emphasized first before examining other regions. This will be helpful because it would be much better to analyse the literature on Nigeria before drawing lessons from the region and from other countries.

Commented [ODG5]: Ditto

from this study do not materially differ from those from earlier investigations in the body of literature. This study's key policy recommendation is that Nigeria's government needs to make sure there is a stronger, systemic connection between tax and spending policies and the development of the public debt. Thus, it would be wise for future study to concentrate on developing a framework for short-term government constraints and fiscal sustainability indicators for identifying and correcting short- and medium-term fiscal imbalances.

The relationship between Nigeria's fiscal policy and the ability to service its national debt was investigated by Imoisi, (2022). The findings show that the variables employed in this study have a long-term association. The results specifically demonstrate that budget deficit affects public debt positively and significantly over the short and long terms, whereas interest rates, real gross domestic product, and inflation rate were statistically insignificant over all time periods and had no effect on public debt. As a result, it was suggested that Nigeria's federal and state budgeting processes be reviewed to ensure that the budgeting system achieves allocative efficiency.

By employing econometric methods and the IMF/World Bank debt burden indicators, Nya and Onyimadu, (2019) examined Nigeria's fiscal policy and public debt sustainability. The findings indicated that the nation's debt had been manageable over the previous eight to ten years, indicating that it could pay its long-term debt obligations. The liquidity indicator also showed that Nigeria could pay its short-term obligations. The empirical outcome of the co-integration test indicated that government revenues and expenditures were co-integrated with respect to fiscal policy sustainability, suggesting that Nigeria's fiscal policy was sustainable despite its weakness. Therefore, the authors advised the government to enact debt limitations to prevent an explosion of the initial stock of debt caused by irrational borrowing by state governments.

Relying on a public debt–average tax revenue ratio and its volatility measure may not be sufficient, there is a need for a more relatively stable macroeconomic environment through sound fiscal actions which is still very indispensable in the world of economic research but the challenges posed by fiscal instability to the domestic economy is indeed a source of concern (Akanni and Osinowo, 2018). The study supports the view that macroeconomic instability occasioned by budgetary deficits is quite unfavourable to economic growth. It was also found out that macroeconomic dynamics in Nigeria have been overwhelmed in the past by fiscal instability. This is as a result of strong deficit emanating from volatile government revenue.

The economic implications of financial globalization on the Nigerian economy were examined by Awoyemi and Jabar, (2019) using the domestic savings channel and the transfer of technology channel as potential influencing factors of economic growth in Nigeria. It was revealed that Nigeria financial system is still at infancy stage as it is being slowly but surely integrated into the globalization process. Also, financial globalization is possibly a wide-ranging phenomenon which signifies growing global linkages created through cross- border financial flows. The study suggests that stern regulation, better policy implementation, well-organized risk management and systemic risk mitigation on the part of the government or regulating authority to boost investors' confidence and guarantee fiscal and monetary sustainability are germane to ensure that the benefits of the recent evolution of the financial market continues nonstop.

The financial crisis of 2008–2009 brought the issue of public finance sustainability to the limelight of empirical analysis considering the connection between the fiscal rules, sound public finance, and government indebtedness. As a crucial response to the fiscal legacy of the financial crisis, fiscal rules have taken the centre stage as a~~n~~ suitable tool of inhibiting contagious effects that may culminate in the sovereign debt crisis. Onofrei, Gavriluta, Bostan, Oprea, Paraschiv and Lazar, (2020) examined the conduct of fiscal activities in the European Union countries. The results of the study showed that fiscal authorities were found acting contrary to the prevailing public debt as indicated by negative reaction of budget balances to the stock of outstanding debt. Thus, fiscal position tends to improve when the index of fiscal responsibility is involved and countries become more viable when they are related to the whole level of fiscal governance, with respect to legal framework, institutional and administrative capacity.

In the strands of empirical literature, fiscal cyclicality, fiscal multipliers, fiscal rules, and large fiscal adjustments are intertwined issues, and their relationships remain an open question and a challenge to address in a jiffy. Therefore some studies point to the importance of understanding the asymmetry of fiscal cyclicality in good times compared with bad times. Alesina, Carlo and Francesco, (2019) employed the use of narrative-identified exogenous fiscal stabilizations, which are assumed not to be correlated with the economic cycle. The findings of the study revealed that there appeared a drastic reduction in government outlay while transfers are much less damaging than tax increases among the 16 OECD countries.

Aizenman, Jinjarak, Nguyen, and Park, (2019) compared fiscal cyclicality across selected developed and developing economies in terms of geography and income levels from 1960 to 2016 and the results revealed a mixed fiscal landscape with more than half of the countries used in the study found to have restricted fiscal space, and that their fiscal policy was either cyclical or procyclical. It was also revealed that when compared to the public debt – GDP ratio, the ratio of public debt to average tax base was adjudged as a standard measure of limited fiscal space. This implies that the more indebted government is, the more the expenditure it incurs in good times and becomes indifferent from a low-debt country in bad times. This was particularly apparent since the 2008–2009 global financial crisis, which was marked by increased procyclical government outlay when considering net acquisition of nonfinancial assets and capital expenditure. The authors constructed a limited-fiscal-capacity statistic, which is measured by public debt–average tax revenue ratio and its volatility; it was found to be positively associated with fiscal procyclicality. Also, being in possession of sovereign wealth funds is a function of larger counter-cyclicality.

The causal relationship between fiscal policy and macroeconomic aggregates was investigated by Osoro, (2019) and it was found out that ever increasing public spending brought about huge public deficits and thus effort should gear towards reducing frivolous public expenditures. The study's suggestion is not only to curb public expenditure but also to broaden and expend the tax base, since more tax revenue is not seen as instrumental to an increased public expenditure. It is indeed a fact that the exclusive nature of the requirements and demands on the public sector's resources is that expenditure will continue to increase non-stop and it has no boundary.

There exist numerous empirical literatures on the relationship between economic growth rates and government expenditures in Cameroon. The empirical work of Jippelli and Meana, (2019) on cross-country study shows that public expenditures on investment and consumption have wide-ranging effects on the level of economic activity in the country. Also, the advanced economies of the world are also exempted from fiscal crisis as Auerbach and Gorodnichenko, (2017) show that for G-7 countries, government spending shocks do not lead to persistent increases in public debt–GDP ratios or costs of borrowing, especially during periods of economic weakness. The primary

concern is on both industrial and developing countries, no nation should be edged out to achieve equitable relatively stable economies.

It was concluded that a rise in public investment enhances output growth and this brings about an increase in government revenue and its resultant effect is increase in government outlay. The focus of the study is on the determinants of public expenditure as a relationship between public investment and output growth. The study concludes that that expenditure tends to engender economic growth and by implication definite revenue sources can be allocated to particular expenditures. The conclusion is theoretically derived from the theory of revenue assignment which justifies assigning revenue from specific taxes to specific activities.

3.0 Methodology

Theoretical Model for Fiscal Sustainability Test

Following Ramsey's (1928) theoretical argument, which was later adopted by Trehan and Walsh (1991) and Romer (2019), every government fiscal position can be characterized in terms of the inter-temporal budget constraint (IBC), which holds that if a government survives on debt, it will eventually have to run surpluses in order to pay off the debt. It also illustrates how far the government has gone above its budgetary limit and how the deficits can be paid for. This indicates that primary surpluses at discounted present value equal current outstanding debt. Therefore, the nominal IBC can be written as:

$$\Delta D_t = G_t + r_t D_{t-1} - R_t \qquad 1$$

Where, $\Delta D_t = (D_t - D_{t-1})$ implies change in debt stock (i. e. current debt outstanding), D_{t-1} is government total debt stock, while $r_t D_{t-1}$ denotes the interest payment of debt financing; R_t is government total revenue while G_t is government total expenditure and $r_t$is the prevailing real interest rate.

Substituting $\Delta D_t = (D_t - D_{t-1})$ in the equation 1 above and we have the primary balance equation expressed in term of government outlay as

$$G_t + (1 + r_t)D_{t-1} = R_t + D_t \qquad 2$$

The debt profile of an economy can also be determined by looking at the future income flows that will be required to pay off the debt. Therefore, the discounted value of anticipated future income accruals from fiscal surpluses (S_{t+1}), could be used to quantify the existing debt stock which is mathematically expressed as calculated as $S_{t+1} = R_{t+1} - D_{t+1}$, for a time period j. On the other hand, debt grows if the fiscal balance is in a deficit rather than a surplus. The discounted surpluses and deficits at the particular period will be added up to form the net current debt stock. Thus, equation 2 above can be expressed in term of present and future discounted fiscal surplus and debt values such that the debt yield for subsequent periods as

$$D_t = \frac{1}{1 + r_t} S_{(t+1)j} + \frac{1}{1 + r_t} D_{(t+1)j} \qquad 3$$

Following Miyazaki (2011), by a simple iterative substitution, and taking conditional expectation, such that equation 3 becomes

$$D_t = \sum_{j=0}^{\infty} \frac{1}{(1 + r_t)^{j+1}} E[S_{(t+1)j}] + lim_{j\to\infty} \frac{1}{(1 + r_t)^{j+1}} E[D_{(t+1)j}] \qquad 4$$

As $j \to \infty$, the present value of expected debt to GDP ratio converges to zero such that

$$\lim_{j\to\infty} \frac{1}{(1 + r_t)^{j+1}} E[D_{(t+1)j}] = 0 \qquad 5$$

It is pertinent to take note that equation above 3.8 can be used to articulate two prominent cases of fiscal sustainability analysis.

i. If $\lim_{j\to\infty} \frac{1}{(1+r_t)^{j+1}} E[D_{(t+1)j}] < 0$, then, forecast discounted future primary surpluses will be greater than the present value of public debt, indicating that the government will eventually generate a net tax revenue.

ii. If $\lim_{j\to\infty} \frac{1}{(1+r_t)^{j+1}} E[D_{(t+1)j}] > 0$, then the government is under pressure to borrow repeatedly throughout to make up the shortfalls, and as a result, accumulate debt to meet the obligation to pay interest on previous debt since the current value of the government debt exceeds the expected primary surpluses.

Therefore, by equating the current value of the outstanding government debt (D_t) to the expected present value of future budget surplus, the necessary condition for fiscal sustainability is determined.

$$D_t = \sum_{j=0}^{\infty} \frac{1}{(1 + r_t)^{j+1}} E[S_{(t+1)j}] \qquad 6$$

Equations 5 and 6 show that the inter-temporal budget balance (IBB) is valid and that the requirements for both transversality and government solvency are met.

Empirical Model for Fiscal Sustainability Test

The primary aim of this study is to verify the Nigerian fiscal sustainability condition, which is achievable in Equation 4 in the theoretical model discussed above. The equation is then is converted to a testable empirical form by determining its first difference as follows:

$$\Delta D_t = \sum_{j=0}^{\infty} \frac{1}{(1 + r_t)^{j+1}} E[\Delta S_{(t+1)j}] + \lim_{j \to \infty} \frac{1}{(1 + r_t)^{j+1}} E[\Delta D_{(t+1)j}] \qquad 7$$

Then equation 7 can be rewritten as

$$G_t + r_t D_{t-1} - R_t = \sum_{j=0}^{\infty} \frac{1}{(1 + r_t)^{j+1}} E[\Delta S_{(t+1)j}] + \lim_{j \to \infty} \frac{1}{(1 + r_t)^{j+1}} E[\Delta D_{(t+1)j}] \qquad 8$$

Assuming that the inter-temporal budget balance condition is valid as shown by equations 5 and 6, then equation 8 can be rewritten as follows:

$$G_t + r_t D_{t-1} - R_t = \sum_{j=0}^{\infty} \frac{1}{(1 + r_t)^{j+1}} E[\Delta S_{(t+1)j}] \qquad 9$$

The empirical test for the existence of the inter-temporal budget constraint (IBC) for fiscal sustainability is thus based on equation 9 above. In essence, it means that the sum of the discounted present value of the current and future budget surpluses will be equal to the sum of the debt's principal and interest yield. According to empirical evidence, the equation attests to IBC's achievement and specifies the requirements that must be satisfied for the anticipated trajectory of government fiscal activity to be sustainable over the long term (Mahmood and Rauf, 2012).

Derivation of Fiscal Sustainability Index

According to Polito and Wickens (2015), the index for fiscal sustainability is generated by rearranging equation 4 such that fiscal balance is equal to the present value of the primary deficit that will arise in the future, which is represented by

$$D_t - \lim_{j\to\infty} \frac{1}{(1+r_t)^{j+1}} E[D_{(t+1)j}] = \sum_{j=0}^{\infty} \frac{1}{(1+r_t)^{j+1}} E[S_{(t+1)j}] \qquad 10$$

The fiscal sustainability index is subsequently generated by comparing the two sides of equation 10 under the presumption that the target level of the debt-to-GDP ratio is a choice and that the fiscal deficit and discount rate are endogenous, time-varying variables. When the deficit and discount rate are fixed, the resulting index is compared to the current debt-to-GDP ratio over n periods. For instance, if the goal is to reduce discounted debt, the left side should be negative and the right side should provide the present value of the primary surplus necessary to reach this debt reduction. Lower primary surpluses are needed as discounted debt increases. The n-period horizon on which the fiscal sustainability indicator is based is consequently on the metric specified as follows:

$$FS_{t,n} = D_t - \lim_{j\to\infty} \frac{1}{(1+r_t)^{j+1}} E[D_{(t+1)j}] - \sum_{j=0}^{\infty} \frac{1}{(1+r_t)^{j+1}} E[S_{(t+1)j}] \lessgtr 0 \qquad 11$$

The study's proposed measure of fiscal sustainability is Equation 11 above. The index allows for a comparison of the current debt-to-GDP ratio. As $j \to \infty$, the second term (i.e. $\lim_{j\to\infty} \frac{1}{(1+r_t)^{j+1}} E[D_{(t+1)j}]$ in $FS_{t,n}$ ends to zero, and the index can be used to compare the level of debt to GDP with the available resources to pay it off. As a result, we have

$$FS_{t,n} = D_t - \sum_{j=0}^{\infty} \frac{1}{(1+r_t)^{j+1}} E[S_{(t+1)j}] \lessgtr 0 \qquad 12$$

If at least $FS_{t,n} = 0$, which denotes that the debt-to-GDP ratio is expected to be on target, the IBC holds and the fiscal policy stance is sustainable. This is a derivable restriction that needs to be met in order to establish fiscal sustainability. A budget process is viable at this point if the implied future stock of debt's expected present discounted value converges to zero. The anticipated present value of the primary surplus, on the other hand, is inadequate to provide the needed shift in the debt-to-GDP ratio when only $FS_{t,n}>0$. In this instance, it is claimed that the existing fiscal stance is unsustainable.

To test for the cointegration between the government's spending G_t and revenue R_t, the stationarity test is specifically performed on the discounted debt series D_t in this regard. For empirical purpose,

the left side of the equation 8 can be reduced to a single variable using the formula $Z_t = G_t + r_t D_{t-1}$ and its right side can be subsumed as

$X_t = \sum_{j=0}^{\infty} \frac{1}{(1+r_t)^{j+1}} E[\Delta S_{(t+1)j}] + R_t$ as streams of income from revenue such that equation 9 becomes:

$$Z_t = \delta + \varphi X_t + \mu_t \qquad 13$$

Equation 13 is a standard augmented OLS regression model with addition of embedded few lead and lag differences of the regressor.

According to Baharumshah and Lau (2017), using the DOLS estimation, a more efficient estimate of the coefficient of the cointegration vector than by simple OLS can be derived.

Under the DOLS approach, two alternative hypotheses of fiscal sustainability can be tested:

i. fiscal policy is sustainable if there is cointegration relationship between Z_t and X_t, with; $0 < \varphi < 1$
ii. fiscal policy is unsustainable even if there is cointegration relationship between Z_t and $\varphi < 0$ *or* $\varphi > 1$

Technique of Analysis

The objective of this paper is to determine the level of fiscal sustainability in Nigeria between 1980 and 2022. The objective is achieved with the use of a Dynamic Ordinary Least Squares (DOLS) technique to test for existence or otherwise of fiscal sustainability based on the inter-temporal budget constrain (IBC). The constraint will provide conditions to be met for the current expected path of government fiscal activity to be sustainable in the long run (Mahmood and Rauf, 2012).

Data Description and Sources

Annual secondary data on debt (measured as debt/GDP ratio), government total revenue (measured as government revenue as a percentage of GDP), government total expenditure (measured as government spending as a percentage of GDP) and the prevailing interest rate (measured as interest rate spread - lending rate minus deposit rate, %) were used. The data were sourced from the World Development Indicators (WDI, 2022), Central Bank of Nigeria statistical bulletin (CBN, 2022).

4.0 Results and Analysis

Unit Root Test

An IPS root test proposed by Im, Pesaran, and Shin, (2003) was used to determine the stationarity or otherwise of the variables used in this analysis. The null hypothesis is that the variable is not stationary. The results of the unit root test are presented in Table 1.

Table 1: Im, Pesaran and Shin Unit Root Test Results

Variable	t - Stat	Prob.
R	-0.8719	0.0787
r	-3.2766	0.0226
Y	1.1184	0.0996
E	-0.6412	0.0847
D	-1.0702	0.0715
Average	-0.9483	
IPM W-stat	1.0622	0.0855

Source: Authors' estimation

The rule of thumb is that the hypothesis will be rejected if the calculated average value of individual IPS t-statistics is less than the IPS t-bar statistics or accepted if otherwise. It is revealed that average value of individual IPS t-statistics (-0.9483) appears to be less than the IPS t-bar statistics of 1.0622 at 10% level of significance, then the null hypothesis is rejected and the variables are stationary levels.

Cointegration Test

The Engel-Granger cointegration test was similarly carried out as a robustness test. The Engel-Granger cointegration test begins first by carrying out a regression such as specified in equation 13, subsequently the residuals from the regression are extracted and then the unit root is applied to this test. The application of the unit root test on the residual obtained from the estimation of equation 13 also shows that the errors in the estimation of fiscal spending (Z_t) and streams of revenue (X_t) converge back to an equilibrium value over a long-run horizon. The result of the Engel-Granger test is as reported in Table 2.

Table 2: Cointegration Test Results

	OLS Regression results for Z_t and X_t		Engle- Granger Cointegration Test Results	
Variable	**Co-efficient**	**Prob.**	**Engle-Granger tau-statistic**	**Engle-Granger z-statistic**
X_t	1.134	0.0443		
Constant	3.739	0.0000	1.920	2.087
W-D Statistics			2.165	2.165

Source: Authors' estimation

The results reveal a statistically significant coefficient of the OLS regression. The cointegration test supports the existence of long run relationship between fiscal expenditure and streams of revenue in Nigeria, thus indicating a strong potential for a long run fiscal sustainability in Nigeria.

Table 3: Fiscal Sustainability Test results

Method: Dynamic OLS **Dependent variable: Fiscal spending (Z_t)**			
Variable	**Co-efficient**	**t- statistics**	**P-value**
Streams of revenue (X)	0.01312	0.4207	0.0676
Constant term	3.7391	2.6074	0.0128
R-squared	0.8329		
Adjusted R-squared	0.7646		

Source: Authors' estimation

Having established the results of the unit root and the Engel and Granger cointegration test, then, equation (13) is estimated using the DOLS regression approach. The key coefficient in equation (13) is φ which measures the response of the revenue streams to the fiscal spending. The value of this coefficient φ is expected to be between zero and unity to be consistent with a stabilizing or sustainable fiscal policy response to rising expenditure over revenue. On the other hand, a negative or greater than unity coefficient denotes a destabilizing or unsustainable response. The result of the DOLS regression is reported in Table 3. The regression is done using linear and trend specification. The DOLS is used here to estimate the cointegration vector and the results reveal a coefficient value of 0.01312 which measures the response of the revenue streams to the fiscal spending and this is an indication of a potential level of the sustainability of fiscal policy in Nigeria.

Though, the coefficient is rather closer to zero but appears significant. Therefore, Nigerian fiscal policy is sustainable since the cointegration relationship between fiscal spending (Z_t) and revenue streams (X_t) is positive and lies between zero and one which practically lends credence to that obtained earlier in the cointegration test. The results are in consonance with the works of Saibu, (2018) and Imoisi, (2022) which conclude that fiscal policy is still within permissible sustainable range for Nigeria.

Formatted: Font: (Default) Times New Roman, 12 pt

Formatted: Font: (Default) Times New Roman, 12 pt

Formatted: Font: 12 pt

Formatted: Font: (Default) Times New Roman, 12 pt

Based on the estimations, the fiscal capacity responses to rising fiscal spending are entirely captured by simple linear decision but the significantly low value of the coefficient is typically an indication of weak fiscal policy sustainability in Nigeria. This may be as a result of continuously rising debt accumulation when fiscal expenditure outgrows that of fiscal capacity.

5.0 Conclusion

This paper attempts to provide empirical clarification on the indicators of fiscal sustainability in Nigeria by comparing the existing level of the fiscal spending with fiscal capacity to pay it off. This is done to ascertain the degree of fiscal consolidation in the African economy to contain increases in public debt. The fiscal spending encompasses the entire government expenditure and interest payment of debt financing while the fiscal capacity entails the government total revenue and government total debt stock. The study starts by providing the theoretical formulation of a simple tool of inter-temporal budget constraint (IBC), which holds that if a government survives on debt, it will eventually have to run surpluses in order to pay off the debt. Using this formulation, the study articulates the conditionality for ascertaining if the Nigerian fiscal policy stance and activities has been sustainable. This study is novel from previous studies by constructing an encompassing fiscal policy index by making use of the entire fiscal policy variables. Then, the index is used it to attest to IBC's achievement and the requirements that must be satisfied for the anticipated trajectory of government fiscal activity to be sustainable over the long term.

It can be inferred that the results from this study do not deviate from that of extant empirical studies. Evidence based on the unit root and cointegration test exercise suggests that fiscal policy is still within permissible sustainable range for Nigeria. The result from the DOLS estimation also lends support to that obtained from the unit root and cointegration test. Therefore, Nigerian

economy is on a verge of weak sustainable level of fiscal policy. The policy implication of the findings of this paper is that Nigerian government should ensure a reasonable cut in her frivolous spending so as to reduce the country's continuous rise in debt profile. This is to enhance a higher level of fiscal sustainability for the African largest economy more robust and systemic link between tax and expenditures policies and the evolution of public debt.

References

Akanni, K. A., and Osinowo, O. H., (2018). Effect of fiscal instability on economic growth in Nigeria. *Advances in economics and business*, 1(2), 45 – 67.

Aizenman, J., Jinjarak, Y., Nguyen, H. T. K. and Park, D. (2019). Fiscal space and increasing fiscal resilience. Asian Development Bank (ADB), Economics working paper series No. 582.

Alesina, A., Carlo, F. and Francesco, G. (2019). The output effect of fiscal consolidation plans. *Journal of international economics* 96: S19–S42.

Awoyemi, B. O. and Jabar, A. A. (2019). Fiscal globalization: economic implications for Nigeria. *IOSR Journal of humanities and social science (IOSR-JHSS, 19 (4), 113-117.*

Baharumshah, A. Z., and Lau, E. (2007). Regime changes and the sustainability of fiscal imbalance in East Asian countries. Economic Modelling, 24(6), 878-894.

Central Bank of Nigeria (CBN) (2022). *Annual report and statement of account.* Abuja, Nigeria.

Chalk, N. and Hemming, R. (2000). Assessing fiscal space in theory and practice. *IMF working paper 00/81*(Washington DC: International Monetary Fund).

Chiang, E. and Moss, G. (2020). Effect of external debt on economic growth and development of Nigeria. *International journal of business and social science*, 3(12), 297 – 304.

Debt Management Office (DMO) (2021). Nigeria's external debt and the economy. DMO publication.

Debt Management Office (DMO) (2022). Annual Report and Statement of Accounts, Abuja, Nigeria.

Heller, P. (2005). Understanding fiscal space. *IMF policy discussion paper 05/4* (IMF, Washington DC).

IMF, (2015) Public debt vulnerabilities in low-income countries: The evolving landscape. Washington DC: International Monetary Fund.

IMF, (2023). World Economic Outlook: · ***International Finance Statistics*** · Indicators Dashboard.

Imoisi, A. (2022). Fiscal policy and sustainability of public debt: The Nigerian experience. *Journal of Jilin University*, 42(03), 18 – 35.

Jappelli, T. and Meana. A.R. (2019). Public investment and welfare: Theory and empirical implications. Discussion paper series No. 887. Centre for economic policy research.

Jibao, S. S., Schoeman, N. J., and Naraidoo I. (2022). Fiscal regime changes and the sustainability of fiscal imbalance in South Africa: a smooth transition error-correction approach. *South Africa journal of economics*, 15(2), 112-127'

Kuncoro, H. (2021). The Indonesia's state budget sustainability and its implication for financial system stability. *Romanian journal of fiscal policy*, 2(1), 36-53.

Mahmood, T. and Rauf, S. A. (2012). Public debt sustainability: Evidence from developing country. *Pakistan economic and social review*, 23- 40.

Miyazaki, T. (2014). Fiscal reform and fiscal sustainability: Evidence from Australia and Sweden. *International review of economics & finance*, 33, 141-151.

Nya, I. and Onyimadu, C. O. (2019). Fiscal policy and public debt sustainability in Nigeria. *Journal of Economics and Sustainable Development*, 10 (19), 6-20.

Onofrei, M., Gavriluta, A., Bostan, I., Oprea, F., Paraschiv, G. and Lazar, C. M. (2020). The implication of fiscal principles and rules on promoting sustainable public finances in the EU Countries. *Sustainability*, 12, (7), 1 – 21.

Oshikoya, T. W. and Tarawalie, A. (2020). Sustainability of fiscal policy: the West African monetary Zone (WAMZ) experience. *Journal of monetary and economic integration*, 9(2), 1-29.

Osoro, N. (2019). Public spending, taxation and deficit. AERC research paper 62. Nairobi, Kenya.

Ostry, J. D., Ghosh, A. R., Kim, J. I. and Qureshi, M. S.(2010). Fiscal space. Washington, DC: International Monetary Fund.

Polito, V. and Wickens, M. (2015). Assessing the fiscal stance in the European Union and the United States, 1970–2011. *Economic policy*, 26(68), 599-647.

Saibu, O. M. (2018). Public spending, fiscal sustainability and macroeconomic performance in Nigeria NDIC Quarterly, 33 (3 & 4), 33 – 48.

Trehan, B. and Walsh, C. E. (1991). Testing intertemporal budget constraints: Theory and applications to U. S. federal budget and current account deficits. *Journal of money, credit and banking*, 23(2), 206 - 223.