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Budget Deficit and Economic Growth in Nigeria: A Further Assessment

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Abstract: As revenue under-performs while the debt profile keeps increasing, the government of Nigeria targets fiscal viability through appropriation. However, in response to various fiscal operations regarding the deficit and the growth in the country, several studies have examined the relationship and come up with divergent findings. On this premise, and while building on previous effort, the objective of this paper is to assess the effect of budget deficit on economic growth over the period 1981-2021 in Nigeria. On the assumption that the economic growth is influenced by other factors aside the main sources of budget deficit, the individual average effect of FDI, ODA, and the public investment was also examined. The pre-estimation diagnostics used the ADF, PP, KPSS method, as well as, Bai-Perron multiple structural break methodology. Moreover, following the unit-root results, the ARDL technique was employed for model estimation. Consequently, whereas a two-way causal relation was established between the economic growth and FDI, a one-way causality was rather found to run from each of budget deficit, ODA, and a public investment to economic growth. Furthermore, the analyses revealed that public investment positively affects the economic growth in both short- and long-run while the budget deficit positively affects in the short-run as against negatively in the long-run. Thus, the government is advised to intensify efforts at boosting public investment to help augment economic growth as the budget deficit is negatively effective in the long-run.

Keywords: Budget, Debt, Deficit, Economic growth, Investment, Revenue.

Introduction

The Keynesians advocate a demand-driven macroeconomic approach which encourages governments to spend more than they have. The idea is that in a situation when economic downturn arises, business uncertainties are triggered which could invariably lead to slow growth and rising unemployment. As a countercyclical response, a deficit spending is advised to be undertaken in order to stimulate investment and consumer spending that are inevitable for boosting aggregate demand. Thus, as a planned fiscal policy, governments could implement the budget deficit by borrowing to increase the spending. Imperatively, however, while being effective for raising the aggregate demand, the spending deficit could also be counterproductive with diminishing marginal returns in an economy where the government persistently runs the budget deficit with high debt profile.

Research Problem

Imperatively, as embedded in Table 1, Nigeria's debt profile is on the high side given debt portfolio rising steadily from NGN32.9 billion in 2020 to NGN39.5 billion and NGN46.2 billion respectively in 2021 and 2022 while debt stock trends to hit projected NGN77 trillion in 2023¹. The projected debt stock follows from the Federal government's proposed budget deficit of NGN10.78 trillion for 2023. The amount represents 4.78% of gross domestic product (GDP) which is larger than 3.39% or NGN6.26 trillion in 2022 and NGN5.196 trillion in 2021. Relative to the deficit, a 3.98 and 3.52% real GDP growth was achieved respectively in the fourth quarters of 2021 and 2022 while 3.75% is targeted for 2023 despite the rate of unemployment reaching 33.3%² as against 22.21% projected for the year³. As such, notwithstanding the consistent increase in the amount proposed for deficit, economic growth has remained inconsistent and elusive.

Table 1

Revenues, Debts and Real GDP in NGN'billion in Nigeria, 1981-2020

Year	Txr	Orv	Nrv	Frv	Pxd	Fdd	Def	Gdp
1981-85	9	9	4	7	11	20	-2.4	17,409
1986-90	21	32	12	21	163	49	-3.7	18,813
1991-95	210	179	51	102	574	291	-4.6	21,898
1996-00	631	693	192	481	1,504	635	1.8	23,753
2001-05	1,525	2,626	575	1,125	3,835	1,282	-1.7	32,969
2006-10	4,128	4,974	1,368	2,639	539	2,805	-0.9	47,013
2011-15	7,868	6,868	2,835	3,680	1,411	7,204	-1.4	63,367
2016-20	8,348	4,524	3,907	3,819	7,751	13,343	-3.2	69,525

Note. Txr = Tax revenue, Orv = Oil revenue, Nrv = Nonoil revenue, Frv = Federal government retained revenue, Pxd = Public external debt, Fdd = Federal government domestic debt, Def = Deficit (% of GDP).

Source: Author's computation using data from Central Bank of Nigeria (2021) and World Bank (2022).

Research Focus

On the above backdrop, and as the 2023 appropriation is set to maintain the fiscal viability amidst under-performing revenue, this paper makes contribution to the discussion on how the budget deficit affects economic growth in Nigeria. Meanwhile, opinions abound, but vary, in the literature regarding

¹ See Debt Management Office (2023) wherein NGN77 trillion is projected as outstanding debt stock following a proposed borrowing of NGN10.57 trillion in the budget.

² See National Bureau of Statistics (2023) which reports underemployment and youth unemployment rates at 22.8 and 42.5%, respectively.

³ According to the Federal Ministry of Finance, Budget and National Planning [FMFBP] (2021), the rate is expected to be lower than 27.19 and 24.32% projected for 2021 and 2022, respectively.

the effectiveness of budget deficit for economic growth. Part of the opinions include Kolawole (2020), Yusuff and Abolaji (2020), Umaru et al. (2021), and Austine et al. (2022), amongst others. However, while Kolawole (2020) and Austine et al. (2022) affirm negative effect, Yusuff and Abolaji (2020), and Umaru et al. (2021) rather hold the view of positive impact. But then the divergence in opinions is not out of place. The fact remains that a time-period analysis spanning over thirty years may generate misleading inference if there are undetected structural breaks or non-constant parameters in the series (Zivot & Andrews, 1992).

Research Objective and Question

As such, while building on Kolawole (2020), the objective of the paper is to assess the effect of budget deficit on economic growth in Nigeria. Although there is no doubt that the deficit raises the stock of national debt, however, the resultant spending is usually meant to stimulate aggregate demand, create more jobs, and eventually grow the economy. Thus, as an intentional expansionary strategy by governments, has the budget deficit been effective for growing the Nigerian economy?

The remaining aspect of the paper is structured as follows. Section two reviews relevant extant literature while section three provides the methodology. Section four presents the results while section five discusses. Finally, section six concludes with policy implications.

Literature Review

The Keynesian postulations on the need for budget deficit, and its positive effect on economic growth, forms the theoretical basis of this paper. Prior to the Keynesian rave, the neoclassical teachings of fiscal responsibility drive the principle of 'no taxes no government spending.' However, as an important tool of macroeconomics, the Keynesians see the deficit as insignificant price paid when compared with economic benefits accompanying high employment. As such, Keynesian theory advocates debt-financed deficit to the effect that, for aggregate demand to increase, government spending must increase to the level that private-spending is offset and tax raise is avoided. Invariably, the Keynesian economics teaches that budget deficit helps in improving economic situation and is useful for maximising social welfare. Moreover, as the economy is assumed to be at the level of underemployment of resources, a negative relationship is believed to subsist between budget deficit and unemployment, as against positive relationship between economic growth and budget deficit.

As regard empirics, a lot of findings have been put forward by several studies which include Sunday Ojo (2014) who adopts vector autoregressive (VAR) technique to examine the implications of deficit financing on economic growth during the period 1970-2010 in Nigeria. The results reveal that deficit financing negatively impacts on economic growth in the country. The study, therefore, suggests reduction in wasteful spending. In another study, Nwanne (2014) investigates the economic stability effect of budget deficit over the period 1970-2013 in Nigeria. The study finds that if financed from external, as well as, non-bank public, deficit causes economic stability in the country. As such, the study recommends the deficit financing meant only for the productive sectors in the country. Moreover, using the Johansen technique, Ogunsakin and Lawal (2015) examine the impact of deficit on economic growth in Nigeria. However, on the assumption that the budget deficit is a macroeconomic indicator of instability, the study suggests commitment to budget implementation along with rapt attention to growth-driving capital expenditure. In review, however, it is observed in the paper that the period covered for the examination is missing. In addition, there are inconsistencies in the findings reported. That is, while the abstract shows that autoregressive distributed lag (ARDL) technique is adopted due to the I(1) order of the series, the text, in contrary claims to use the Johansen methodology following that the series integrate at order 2.

Furthermore, for Sri Lanka, Aslam (2016) uses the Johansen and error correction mechanism (ECM) techniques to test the dynamic relationship between the budget deficit and economic growth

over the period 1959-2013. As the ECM reveals an unpreserved short-run relationship, the Johansen technique rather reports a long-run relationship. The overall analysis establishes a positive relationship between budget deficit and economic growth. As such, the study suggests that deficit should be encouraged in the country's annual budget. In a panel study of Baltic countries, Dritsakis and Stamatiou (2016) investigate the importance of budget deficit on economic growth during the period 1885–2012. While a negative relationship is established in the short-run and in the long-run, yet, a one-way causality is found to run from the budget deficit to economic growth. However, for the period 1981–2013 in Nigeria, Nwaeke and Korgbeelo (2016) examine the sources and impacts of budget deficits on economic growth. The study finds that externally financed deficits make a insignificant impact on economic growth unlike those that are financed from domestic sources. Therefore, the study recommends the diversification of the economy, as well as, broadening the revenue base of the country. In review, however, it is observed that the paper does not carry out necessary unit root test before embarking on regression analysis. The implication of this is that the results of the estimation could turn out to be spurious.

Meanwhile, Fagbohun (2017) employs the ordinary least squares (OLS) method to examine the impact of budget deficit on economic performance over the period 1970-2013 in Nigeria. As measure of economic performance, the study uses the per capita income, the unemployment rate and the price stability. Consequently, findings reveal that the deficit does not bring about employment-generating growth. Thus, the study recommends an examination into why deficit spending does not lead to employment-generating economic growth. In review, it is observed that the paper fails to conduct the necessary unit root tests on the data employed. Basically, the failure to carry out preliminary diagnostic tests like the unit root test could render the results spurious. In a comparative study, Abdullah et al. (2018) use the Johansen co-integration procedure and threshold level ranging between 4.55 to 5.0% of GDP to examine the impact of fiscal deficit on the growth of Bangladesh economy during the period from 1975/76 to 2014/15. The results reveal budget deficit impacting economic growth in long-run while short-run adjustment appears not feasible. The study, therefore recommends caution when incurring growth-enhancing expenditures. In review, it is observed that the study fails to relate its recommendation to the findings. This, undoubtedly, renders the recommendation to be ad hoc.

Moreover, in Nigeria, Aero and Ogundipe (2018) employs the Threshold Autoregressive (TAR) model to investigate the effects of fiscal deficits on economic growth during the period 1981-2014. Based on 5% optimal fiscal deficit threshold, a negatively significant relationship is established between deficit and economic growth in the country. In effect, the study recommends increase in capital spending along with a threshold of 5% fiscal deficit. Similarly, Ali et al. (2018) employ the ARDL technique to examine the impact of deficit on economic growth over the period from 1981 to 2016. The study finds a significantly positive impact on economic growth. Therefore, it is suggested that the deficit financing should be increased along with efficient deployment of public expenditure for the country's development. In addition, Onwioduokit and Inam (2018) adopt the OLS technique to investigate the relationship between budget deficits and economic growth in Liberia. Given an outcome of a positive significant relationship in the long-run, the study recommends a growth-maximizing combination of monetary and fiscal policies for the country. In review, however, it is observed that the study does not indicate the covered period. Essentially, the covered period forms part of the scope of a study and it provides room for comparison of results with other studies. Also, the results of the unit root tests support the use of the ARDL technique rather than the Engle-Granger procedure adopted in the study. Imperatively, the ARDL is the most suitable technique for estimating series which integrate at $I(0)$ and $I(1)$.

Using a descriptive appraisal approach over the period 1980-2016, Ubi and Inyang (2018) analyse the implication of fiscal deficit on economic development of Nigeria. The study finds that the fiscal deficit positively affects the economic growth as recurrent expenditure positively associates with deficit. As

such, it is recommended that investment in capital project could help boost aggregate output in the country. In review, it is observed that a descriptive or summary statistics of the variables is not presented to show the basis of the appraisal. Also, while using the asymmetric causality approach, Mucuk et al. (2019) test the relationship between budget deficit and economic growth over the period 1980-2011 in Turkey. Findings reveal that expansionary fiscal policy propels economic growth in the country. It is, however, observed in the review that the study fails to adapt any economic theory as it does not specify a model to represent the relationship under study.

Meanwhile, Efuntade (2020) investigates how the expenditure and revenue, amongst others, relates to the real GDP in Nigeria. While covering the period from 1989 to 2019, the study specifically finds a significant and co-integrating relationship as excessive reduction in revenue and expenditure significantly affects growth. Thus, in the affirmation of poor financial management in the country, reduction in public borrowing is recommended. In the review, it is observed that the paper does not state the specific level of significance on which its statistical decisions are based. This follows from the fact that the regression results of the study shows that while one variable is significant at 1%, another is significant at 10% as others are not significant. Yet, the study's discussion portends that all the variables have the same level of significance. In a similar study that uses the ARDL technique, Kolawole (2020) considers the period 1981-2018 to examine the effectiveness of the budget deficit on economic growth in Nigeria. Findings show that the deficit exerts a significantly negative effect on economic growth. As such, the government is advised to improve on its efforts at generating more revenue from tax. Also, in the attempt to ascertain how influential is deficit on economic growth between 1981 and 2016, Yusuff and Abolaji (2020) adopt the bound test technique to examine the relationship. As the study affirms a long-run relationship, it further finds that budget deficit has significant positive influence on economic growth in Nigeria. However, while considering Ghana's inability to raise revenue to fund its budget, Akoto (2020) adopts the correlation methodology to assess the impact of deficit on the country's economy during the period 2007-2016. The result shows that a negative correlation subsists between deficit financing and economic growth in the country in the period considered. Also, it is established that the deficit increases more in Ghana during election year due to the over-ambition of politicians.

Furthermore, Umaru et al. (2021) compares both the TAR model and ARDL to examine budget deficit and economic growth relationship during the period 1981-2019 in Nigeria. In effect, corroborating results are revealed as TAR analysis affirms that economic growth is positively driven by budget deficit. However, the findings are expected to subsist if the deficit does not overshoot the optimal threshold. It is therefore recommended that fiscal policy should guarantee that a threshold of 2.02% of GDP is not exceeded. Similarly, in the period 1981-2019, Akamobi and Unachukwu (2021) use the ARDL approach to probe the extent to which budget deficit affects private and public investment in Nigeria. The result corroborates earlier studies that there is no crowding-out effect on investment as budget deficit impacts positively on public investment and economic growth in the country. Thus, it is suggested that where budget deficit is necessary, its focus should be directed at productive sectors.

Moreover, Austine et al. (2022) also utilises the ARDL approach to examine how fiscal deficit impacts Nigeria's economic growth during the period 1981-2020. The cointegration analysis reveals a negative impact as economic growth slows by 18.6% from a 1% increase in deficit. The study thus recommends that government borrowing should not be in cash but rather in building infrastructure. Furthermore, in the attempt to ascertain the best financial option for the government, Nwankpa (2022) employs the regression analysis to examine the implications of budget deficit financing for economic growth during the period 2003-2018 in Nigeria. It is revealed that if financed through non-bank public and bank credit, budget deficit propels the rate of growth of the economy. Therefore, as ways and means negatively impact, it is recommended that government should be mindful of the medium and long terms consequence of debt default if deficit is financed through external source. Also, in a disaggregated VAR

analysis, Onwuka (2022) investigates how deficit impacts economic growth over the period 1980-2020 in Nigeria. The results show that when financed through external sources, deficit exerts significant positive impact on growth as against negative impact when financed through domestic channel. Nonetheless, Osei and Ogunkola (2022) use the theory of fiscal price level and Markov-Switching Regime Dynamic Model to investigate the effects of deficit financing on the dynamics of inflation over the period 1980-2018 in Ghana. Findings show that, in the lower regime, deficit financing's impact on inflation is subdued. As such, going forward, it is proffered that government should adopt a fiscal policy action that could engender a consistent fiscal sustainability with low inflation.

In summary, it is evident in the review that none of the studies considers the average impact of foreign direct investment (FDI), official development assistance (ODA), and public investment (INV) in the budget deficit-economic growth relationship in Nigeria. In addition, despite obtaining I(1) order of integration in their unit root results, all the studies except Kolawole (2020), fail to go further in the pre-estimation diagnostic to conduct structural break tests on the series which integrate at first difference. The structural break tests would have availed the studies some vital information on why the series could not integrate at level. Thus, the drawbacks in the reviewed studies provide the justification for this paper.

Research Methodology

The assessment of the effect of budget deficit on economic growth assumed a multivariate relationship. The independent variables included the budget deficit, FDI, ODA and INV. The dependent variable was real GDP which is measured in constant 2010 United States Dollar (USD) while each of the independent variables is measured as percentage of GDP. The general analysis commenced with the pre-estimation diagnostics involving Dickey-Fuller breakpoint, the Dickey and Fuller (1979), Phillips and Perron (1988), and Kwiatkowski et al. (1992) unit root tests, the Granger (1988) causality test, as well as the Bai and Perron (2003) multiple structural break methodology. In the attempt to ascertain the efficacy of deficit on economic growth amidst rising debt, and for the need to extend the period of analysis, the paper covered the period 1981-2021. Moreover, since data for other variables are already in percentages and for the need to ease the interpretation of results, data for real GDP are transformed to natural logarithms. Nonetheless, all data were sourced from Central Bank of Nigeria (2021) and World Bank (2022).

Meanwhile, the framework leading to the empirical model arise from the AK model of King and Rebelo (1990) in the form,

$$Y = AK \quad (1)$$

where, Y is output, K was the capital stock, and A is time invariant productivity parameter. However, by assuming constant returns to scale, capital becomes the only input in the form $Y = K$. Thus, considering fiscal policy-effect of budget deficit on growth, the model transforms to

$$Y = f(Def, K) \quad (2)$$

where, Def is budget deficit.

However, given that K is capital and represents public investment which influences the economic growth along with FDI and ODA, then following Le and Suruga (2005a, 2005b) and Kolawole (2013, 2020), the functional relationship in equation (2) expands thus,

$$Y = f(Def, Fdi, Oda, Inv) \quad (3)$$

and considering the period in time, t, equation (3) transforms linearly to,

$$Y_t = \beta_0 + \beta_1 Def_t + \beta_2 Fdi_t + \beta_3 Oda_t + \beta_4 Inv_t + \varepsilon_t \quad (4)$$

where, β_0 is constant term, the $\beta_{(1,\dots,4)}$ are estimation parameters which by expectations are to be positive, while ε is the error term.

In effect, equation (4) is the empirical model and it states that real growth is determined averagely by budget deficit and every other variable on the right-hand-side.

Research Results

Imperatively, the research results are split into pre-estimation and estimation as presented below with narratives.

Pre-estimation Results

The summary or descriptive statistics is presented in Table 2. Notably, there is significant variation in the manner the variables trend. For example, the statistical distribution reveals that all the series, except the deficit, are positively skewed. The kurtosis shows only real GDP to be platykurtic in nature since the value is less than 3. However, by extension, deficit, FDI, ODA and INV appear leptokurtic which necessarily indicates a flatter than normal distribution. Imperatively, the Jarque-Berra statistics which combines skewness and kurtosis is a goodness of fit of whether sample data are normally distributed.

Table 2

Summary Statistics

	RGDP	DEF	FDI	ODA	INV
Mean	2.52E+11	-2.50488	1.512377	0.655695	35.42959
Median	1.78E+11	-2.4	1.099403	0.473159	30.03794
Maximum	4.77E+11	0.8	5.790847	4.939039	89.38613
Minimum	1.07E+11	-8.6	0.257422	0.024093	14.16873
Std. Dev.	1.36E+11	1.849453	1.215949	0.914240	19.03860
Skewness	0.579467	-0.8367	1.808079	3.709885	1.103523
Kurtosis	1.714775	4.312609	6.348814	16.61969	3.916602
Jarque-Bera	5.116341	7.727187	41.49739	410.9377	9.756651
Probability	0.077446	0.020992	0.000000	0.000000	0.007610
Sum	1.03E+13	-102.7	62.00744	26.88351	1452.613
Sum Sq. Dev.	7.36E+23	136.819	59.14130	33.43340	14498.73
Observations	41	41	41	41	41

Source: Author's computation.

The summary further speaks to the mean values of the variables such that real GDP averages about USD252 billion while as percentage of GDP, deficit averages -2.5 as against 1.5, 0.6 and 35.4 for FDI, ODA and INV, respectively over the period considered. Incidentally, the value of deficit appears not to be moving proportionally with that of FDI and ODA which are supposed to be cushioning on the economy. However, if the real GDP is reflective of the performance of economic activities, then an average relative stock in public investment is robust enough given a maximum of 89.3% and minimum of 14.1% over the period from 1981 to 2021.

Furthermore, the results of the Dickey-Fuller breakpoint minimum tests in Table 3 showed that there was a breakpoint in real GDP series in 2001. This is affirmed by the unit-root results in Table 4 where among the variables, real GDP is not stationary at level across the three techniques employed. As such, an additional test is required to ascertain whether, or not, there are rather multiple breaks in the series. In this regard, the Bai and Perron (2003) methodology is utilised.

Table 3*Results of Dickey-Fuller Breakpoint Minimum Tests*

Series	LRgdp	Def	Fdi	Oda	Inv
Critical value	-3.19	-5.43	-5.1	-6.29	-4.2
Probability	0.57	0.00	0.00	0.00	0.09
Break date	2001	1993	1994	2006	1999

Note. Statistical decisions are based on 5% level of significance.

Source: Author's computation.

Meanwhile, the result of the Bai-Perron test in Table 5 affirms a multiple break in the real GDP series in 1993 and 2008. This, invariably, calls for further test through the Perron (1989) approach.

Table 4*Results of Unit-root Tests*

Variable	ADF			PP			KPSS		
	Level	1st Diff	Dec	Level	1st Diff	Dec	Level	1st Diff	Dec
<i>LRgdp</i>	-1.11	-3.86	I(1)	0.39	-3.86	I(1)	0.75	-0.28	I(1)
<i>Def</i>	-3.16	-	I(0)	-3.23	-	I(0)	0.23	-	I(0)
<i>Fdi</i>	-3.97	-	I(0)	-3.9	-	I(0)	0.15	-	I(0)
<i>Oda</i>	-4.33	-	I(0)	-3.26	-	I(0)	0.24	-	I(0)
<i>Inv</i>	-3.75	-	I(0)	-3.67	-	I(0)	0.18	-	I(0)

Note. Statistical decisions are based on 5% level of significance.

Source: Author's computation.

Incidentally, the Perron (1989) approach is necessarily required to confirm whether, or not, the breaks are the cause of non-stationarity in the series (Kolawole, 2021). Therefore, the real GDP series is partitioned into three segments which are afterwards subjected to stationarity tests, separately. The results are as presented in Table 6.

Table 5*Result of Bai-Perron Test*

Series	Break Dates	F-stat (1)	Critical value	F-stat (1)	Critical value
<i>LRgdp</i>	1993, 2009	2333.011	8.01	62.14322	9.13

Source: Author's computation

The conclusion that each of the segments is stationary, as shown in Table 6, speaks to the fact that the breaks are actually the reason for the non-stationarity of the real GDP series before partitioning.

Table 6*Result of Stationarity Test on Individual Segment*

Segment	1	2	3
Year	1981-1992	1993-2008	2009-2021
ADF	-4.16	-5.32	-4.04
PP	-4.17	-5.32	-4.03
KPSS	0.21	0.14	0.23
Conclusion	S	S	S

Note. S = stationary. Statistical decisions are based on 5% level of significance.

Source: Author's computation

In effect, the break in the LRgdp series in 1993 is ascribed to the decline in the monetary value of real output from USD150.6 billion in 1992 to USD147.6 billion in 1993. The decline, invariably translates into the rate of growth of GDP slowing from 4.6% in 1992 to -2% in 1993. Moreover, the break in 2008 might be linked probably to size of fiscal balance adjusting slightly from -0.36% of GDP in 2007 to -0.12% in 2008 despite real output rising respectively from USD290.1 billion to USD309.7 billion in 2008 (World Bank, 2022).

Table 7

Relationship to be Estimated Based on Bai-Perron Result

Series	Equation	Break Dates
LRgdp	$LRgdp_t = C + D_{1993} + D_{2008} + T + D_{1993}T + D_{2008}T + \mu_t$	1993, 2008

Source: Author's computation

Thus, for the reason to ascertain the effects of the 1993 and 2008 breaks, and following the Bai and Perron (2003) methodology, the estimation of the comparable equation in Table 7 becomes necessary. In the equation, T represents trend while D captures the dummy variables and C is a constant term. Being proxy for missing values, D is 1 for the break date as well as the subsequent years, and is 0 for the years before the break. Thus, the 1993 dummy is 0 from 1981 to 1992 and 1 from 1993 to 2021; the 2008 dummy is 0 from 1981 to 2007 and 1 from 2008 to 2021 (Weideman et al, 2017; Kolawole, 2020, 2021).

Moreover, in order to confirm the causal relationship between each pair of the variables, the selection of an appropriate lag is required. In this regard, as reported in Table 8, the process settles for lag 1 as selected by all the criteria.

Table 8

Lag Order Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-320.286	NA	18.7458	17.1203	17.3357	17.1969
1	-178.717	238.432*	0.04113*	10.9851*	12.2779*	11.4451*
2	-159.012	28.0020	0.05840	11.2637	13.6339	12.1071
3	-137.895	24.4509	0.08698	11.4681	14.9157	12.6947

Source: Author's computation

The results of the pairwise causal relationship are presented in Table 9. It needs be noted that the test is based on the null hypothesis of the relationship which states that there is Granger no-causality between a pair of variables. As such, if the probability value of the test is greater than 5% level of significance, it means that the null hypothesis cannot be rejected. Otherwise, if it is approximately 5%, or less, the null is rejected (Granger, 1988). Interestingly, the results show that while a two-way causal relationship is established between real GDP and FDI, a one-way causality is rather found to run from each of budget deficit, ODA, and public investment to real GDP.

Table 9

Pairwise Granger-causality Between Economic Growth and Budget Deficit

Null Hypothesis	F-Statistic	Probability	Decision
DEF does not Granger Cause LRGDP	4.20977	0.0473	Reject
LRGDP does not Granger Cause DEF	0.10516	0.7476	Cannot reject
FDI does not Granger Cause LRGDP	3.71765	0.0486	Reject
LRGDP does not Granger Cause FDI	4.28680	0.0415	Reject
ODA does not Granger Cause LRGDP	5.65392	0.0139	Reject

LRGDP does not Granger Cause ODA	0.53058	0.4709	Cannot reject
INV does not Granger Cause LRGDP	35.2427	8.00E-07	Reject
LRGDP does not Granger Cause INV	0.62695	0.4335	Cannot reject

Source: Author's computation.

Estimation Results

Essentially, the decision on the appropriate estimation technique for analysis rests on the outcome of the unit-root tests. Practically, in a situation when long time-series are involved and the variables integrate in the same order or at first difference, the Engle-Granger, Philips-Ouliaris and Johansen approaches are the appropriate cointegration techniques (Glen, 2020). However, where the unit-root results show that the variables are integrated at level and first difference, that is, $I(0)$ and $I(1)$, or fractionally, the ARDL is the most suitable technique (Pesaran et al., 2001; Harris & Sollis, 2003). Therefore, given the above unit-root results, the study adopts ARDL technique. Thus, Table 10 presents the ARDL estimation results.

Table 10

Effects of Budget Deficit on Economic Growth in the Short- and Long-run in Nigeria

Long-run estimates: Dependent variable: <i>LRgdp</i>					Short-run estimates: Dependent variable: $\Delta(LRgdp)$				
Variable	Coeff	S-Error	t-stat	Prob	Variable	Coeff	S-Error	t-stat	Prob
<i>C</i>	27.01	0.12	11.72	0.00	<i>C</i>	9.93	0.04	21.31	0.00
<i>LRgdp(-1)</i>	2.28	0.12	18.85	0.00	$\Delta(LRgdp(-1))$	1.28	0.11	11.43	0.00
<i>Def(-1)</i>	-0.03	0.01	-9.34	0.00	$\Delta(Def(-1))$	0.81	0.16	4.67	0.03
<i>Fdi(-1)</i>	0.11	0.54	1.07	0.23	$\Delta(Fdi(-1))$	0.02	0.01	1.84	0.08
<i>Oda(-1)</i>	0.06	0.05	1.14	0.26	$\Delta(Oda(-1))$	0.65	0.62	1.04	0.31
<i>Inv(-1)</i>	0.64	0.24	2.69	0.03	$\Delta(Inv(-1))$	0.37	0.18	2.05	0.04
					<i>Ect(-1)</i>	-0.83	0.03	-2.71	0.01
Adj R ²	0.71				Adj R ²	0.74			
F-Stat	28.33	0.01			F-Stat	13.48	0.02		
DW-stat	1.66				DW-stat	1.72			

Note. Statistical decisions are based on 5% level of significance.

Source: Author's computation.

Table 11

OLS Result from the Estimation of the Equation in Table 7

Series	C	C-1993	C-2008	T	T-1993	T-2008
<i>LRgdp</i>	27.0	2.63**	0.91	-1.7	0.13	2.33**

Note. ** denote significance at 5% level.

Source: Author's computation.

Discussion

The pairwise causal relationship between the budget deficit and the economic growth shows that deficit Granger-causes real GDP, thereby corroborating Kolawole (2020). However, the case of real GDP Granger-causing FDI supports Kolawole and Odubunmi (2015). Also, as FDI causes real GDP, it supports theoretical literature of the standard Solow-type neoclassical model which holds that FDI stimulates economic growth through capital stock by technological enhancement and productivity (Driffield & Jones, 2013; Kolawole, 2013). In addition, the causal effect of ODA on real GDP affirms Burnside and

Dollar's (2000) view that if aid is provided to countries with good policies, it can raise economic growth. Moreover, as regard public investment Granger-causing real GDP, it relates to the findings by Le and Suruga (2005b) who stress that public investment positively contributes to per capita growth. However, if public investment is substantially high, it reduces the positive effect of FDI on economic growth.

With respect to the estimation results presented in Table 10, it technically shows the short- and long-run estimates of the effect of budget deficit on economic growth. In the short-run results, budget deficit appears to impact real GDP positively and significantly. Numerically, it shows that a 10-percentage point increase in the amount of deficit brings about a corresponding 8% improvement in economic growth. Although, in line with the Keynesian economics, Ross (2020) is of the opinion that an immediate consequence of deficit is not likely in the short-run. Relative to previous studies, however, the result corroborates that of Kolawole (2020), Yusuff and Abolaji (2020), Umaru et al. (2021), and Nwakpa (2022). Similarly, the results reveal that the public investment is significant and affects real GDP positively given that a 10-percentage point rise in investment leads to 3% boost in the growth of the economy. Moreover, despite the theoretical expectations, FDI and ODA are not significant in propelling the economic growth in the short-run. Imperatively, the sterile posture of FDI and ODA might be ascribed to the fact that FDI inflows to developing country like Nigeria are mostly directed to the oil and gas sector where substantial amount of the profits is repatriated abroad to the private investors. Specifically, net ODA inflow to the country fluctuates over the years as it reaches 4.9% of gross national income (GNI) in 2006 before declining continuously to about 0.8% in 2020 (World Bank, 2022). Hence, its insignificant effect on economic growth in the country.

Regarding the long-run estimates, the significant negative effect of deficit on real GDP conforms to expectation but departs from the Keynesian postulation. In effect, economic growth is reduced by 0.3% given a 10-percentage point addition to the budget deficit. As such, if the deficit is assumed to have been financed through domestic sources, the finding supports Austine et al. (2022) and Onwuka (2022). Also, like in the short-run, the public investment is revealed to be significant and impacts growth positively. Specifically, as it partially corroborates Le and Suruga (2005b), a 10-percentage point increase in the level of public investment leads to a 6% rise in the output growth of the economy. This invariably attests to the growth-enhancing effect of public investment in the form of capital accumulation in an economy. Incidentally, like in the short-run, FDI and ODA fail to impact growth over the period considered. Essentially, African Development Bank (2023) points to the fact that, as one of the five major recipients of FDI in Africa, Nigeria defies economic challenges and continuously attracts as much as USD4.8 billion FDI inflows to different sectors in 2021. Although the sectoral focus of the inflows is shifting away from oil and gas to others which include agriculture, manufacturing and electric power, however, the net outflow of USD3.7 billion in 2020 could be responsible for the overall insignificant effect of FDI on economic growth in the period considered. Similarly, regarding World Bank's (2022) records, the not-so-impacting ODA could be ascribed to the amount attracted by the country which slightly increases from a five-year average of 0.04% of GNI in the period 1981-1985 to 1.5% in the period 2006-2010 before slowing persistently to 0.8% in the period 2016-2020 (Kolawole, 2021).

Meanwhile, the result in Table 11 is of no consequence when compared with the long-run results in Table 10. The reason being that LRgdp is the dependent variable in the assessment and an estimation on how it affects itself as a series might end up spurious. However, comparing the short- and long-run results in Table 10 with earlier studies, the findings substantially corroborate Kolawole (2020) on the affirmation that budget deficit reduces economic growth in the long-run as against boosting it in the short-run. Imperatively, the findings of positive effect support Yusuff and Abolaji (2020), Umaru et al. (2021), and Nwakpa (2022) while the findings of negative effect corroborate Austine et al. (2022) and Onwuka (2020), amongst others.

Generally, there is disparity in the findings of this research with the earlier published results. The disparity could be ascribed to the use of Dickey-Fuller breakpoint minimum tests technique which

suggests the possibility of breaks in the series, and serves as precursor to the standard unit root tests. Also, the time period considered for the research is another cogent source of disparity in findings. More importantly, the disparity could justifiably be drawn from the assessment of the average impacts of FDI, ODA and INV in the analysis.

Limitation of the Study

Being an empirical research based on secondary data sources, the major limitation arises from the lack of access to data on fiscal variables. Specifically, the study finds it difficult to obtain and collate data on public revenues and other sources that are suitable for financing the budget deficit. Such other sources include the capital market and credit from commercial banks. Essentially, because data on public revenues are not available, it limits the study's intended probe into ascertaining whether, or not, it is public revenue-financed deficit that propels economic growth in Nigeria.

Conclusion and Implications

The effect of the budget deficit on economic growth in Nigeria hinges on the stance of the government regarding fiscal policy and macroeconomic target. Incidentally, as the government thrives to finance deficit more from foreign sources, a 40/60 financing ratio is targeted from international and domestic markets. In effect, USD1.5 billion and USD300 million Eurobond and diaspora bond are issued in 2017. In addition, efforts are geared towards improving the public financial management through the implementation of the treasury single account, integrated financial management information system, and the payroll and personnel information system. Also, while plans are put in place to improve fiscal space by boosting revenues, yet, economic growth contracts by 6.1% in the second quarter of 2020 as debt service takes 23.2% of total expenditure in the same year. Consequently, in 2021, even as the country's budget deficit/GDP and debt/GDP ratios of -4.0% and 21.6%, respectively are the lowest in Africa, the debt service/revenue ratio of 73% ranks highest in the continent. Nonetheless, as it stands, Nigeria has a fiscal challenge of growing the revenue given that the budget deficit negatively impacts on economic growth in the long-run.

Meanwhile, it suffices to say that if it is necessary for the government to embark on deficit spending, it should plan it for the short-run. This is important for the fact that it is in the short-run that budget deficit can improve economic growth in the country. Also, while the government seeks increased economic growth through deficit budgeting, it should make more efforts at boosting the public investment. The implication of this is that the public investment will always be augments to propelling economic growth even if deficit is not positively effective in the long-run.

Suggestion for Future Research

Very imperative is the fact that since the source of finance is of paramount importance to the implementation of budgetary policy, it therefore follows that future research might look into the relationship subsisting among budget deficit, revenue and economic growth. Such research could be driven by specific focus on the efficacy of public revenue for deficit financing in the country. Because Nigeria is an oil exporting country, the research could consider the splitting revenue into oil-revenue and non-oil revenue. The non-oil revenue could be decomposed into tax and sales of government owned non-oil assets such as agricultural produce and manufacturing outputs, amongst others. Being an empirical study, the research could be quantitative in nature by employing econometric methodology. In this regard, the period to be considered could be extended beyond 2021 in order to arrive at probably more robust results. Also, instead of annual data, the research could use monthly or quarterly series. However, pre-estimation diagnostic would be necessary in order to guide against spurious results. Thus, after conducting descriptive statistics, the correlation matrix could be added before proceeding with Dickey-Fuller breakpoint minimum tests, unit root tests, if necessary, the multiple breakpoint test, and pairwise causality test. Accordingly, using regression analysis, the effect of each of the revenue elements

on deficit would be examined first, one-after-the-other and later, together. In essence, the revenue element that significantly impacts positively on deficit would be used to proxy deficit in the next relationship involving economic growth and another set of control variables which might include public investment, FDI, and other economic or institutional variables. Consequently, the first relationship would reveal the best revenue element that could finance deficit. In turn, the second relationship would establish an economic growth-enhancing source for financing deficit.

In effect, the overall findings would go a long way in sensitising the government on the need for more revenue, as well as, the paramount importance of public financial management. For example, if oil-revenue appears to be the best source for financing deficit and it eventually drive economic growth, it would imply that government should intensify efforts at collecting more revenue from oil sales. By extension, it would point to the fact that government would need to make the moribund refineries functional. If the refineries become functional, the country would make more revenue as oil exports would increase while the cost hitherto expended on the importation of refined oil would reduce to zero. Also, more revenue from oil would indirectly boost the country's credit worthiness as there would be reduction in the level of borrowing that might ordinarily be used to finance deficit. But then if oil revenue does not turn out to be of positive impact on the deficit, the country would need to shift its focus away from oil to non-oil sector of the economy. Interestingly, the country might look the way of tax. By expanding the tax base and improving the collection process, more fund would be available in lieu of oil. Nonetheless, however, lack of access to data on fiscal variables might also serve as limitation to the future research.

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Conflict of Interest

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