Original Research Article

BUDGET DEFICIT, BUDGET REFORM AND ECONOMIC GROWTH IN NIGERIA

ABSTRACT

This study examine the impact of budget reforms and budget deficits on economic growth in Nigeria from 1981 to 2023.The study adopted the Vector error correction model to analyze the time series data. Findings from the Vector error correction model analysis revealed that budget deficit, budget reform has a significant impact on the economic growth of Nigeria. Based on the findings from the study, the study recommends that for improved economic growth, budget reform policies should be such that the ensure linkages of government expenditures ceilings to government revenue, external debt to current account balances and public debt to budget balances. On this basis IMF benchmarks for liquidity, solvency and stationarity can be meet. Furthermore, the positive impact of budget deficit and budget reform on economic growth calls for more budget policy reforms that will encourage increase funding to sectors like education and health. These sectors enable growth in any economy. In the same manner, the share of capital expenditure to recurrent expenditure should be such that meets quick acid test ratio like in the 18 years of the study period. Increase government spending especially in budgetary allocation to capital expenditure in areas like education, health, power and housing. Budget reform policies like UBE Act 2003, TETF 2013 should be encouraged. It enhances sectoral allocation efficiency and stimulates economic growth in Nigeria.

Keywords: Budget deficit; Budget reform; Economic growth; Vector error correction model; Nigeria.

1. Introduction

Budget deficit and reform have a significant impact on the economic growth of countries worldwide. In both high- and low-income nations, it has been at the forefront of macroeconomic adjustment since 1980 and has garnered a lot of attention over the last three decades (Easterly, Rodriguez & Schmidt-Hebbel, 2004). In order to achieve rapid economic growth and development, a growing nation like Nigeria must make sure that a standard budget reform is in place that connects the annual budget goal to the medium- and long-term goals of the government

In particular, budget deficits and reforms have been identified as the primary cause of the economic distortions that have plagued low-income nations (Easterly and Schmidt-Hebbel, 2003).However, a number of arguments and theoretical foundations have been proposed on the relationship between budget deficit, budget reform, and economic growth. According to Egwaikhide (1999) and Onafowokan and Omoye (2006), the Nigerian experience has yielded a range of results on neutral, positive, and negative relationships among the variables. In 1989, for example, the budget deficit was -15.14 billion naira, and the budget reform index was below average at 1.8. Despite this, real GDP increased to 17294.68 billion naira. By 1990, the budget reform index had improved to 0.89, but rather than decreasing, the budget deficit increased to -22.12 billion naira, which had a little impact on real GDP, which was 19,305 billion naira. With a negative real GDP growth of -1092.69 billion naira and a budget deficit that continued to grow to -2673.84 billion naira, the Nigerian economy officially entered recession in 2016. The country's budget reform index was 1.45 (BudgetIT Nigeria Reports, 2018; Central Bank of Nigeria Statistical Bulletin, 2018; World Bank Reports, 2018). In light of primarily classical and Keynesian theories, this empirical evidence highlights the disparities between the variables and highlights the necessity of examining the underlying relationship between budget deficit reforms and economic growth, which has been observed in some years but not in others (Amirkhalkhali, Dar & Amirkhalkhali; 1996, Rosen & Gayer, 2004).

The GDP growth rate in Nigeria has fluctuated. The nation's economic activity peaked between 1981 and 1984, but it fell to its lowest point in 1986. 1990 saw a decline in economic activity, which fell to its lowest point once more in 1991. The economy recovered in 1992 and kept growing until it peaked in 2002. Between 2005 and 2008, the economy declined, but in 2010, it recovered. The global decline in crude oil prices caused the economy to weaken in 2015 and enter a recession in 2016 (CBN, 2009 and 2018). Thus, in 1970, Nigeria’s GDP growth rate stood at 25.01 percent but later dropped to 4.2 percent in 1980. In 1990, it increases to 11.78 percent and later declined to 5.92 percent in year 2000. By 2010, the country’s GDP growth rate was 8.01 percent but it dropped to 2.2 percent in 2019. Due to the impact of covid-19, Nigeria’s GDP growth rate became negative at -1.8 per cent by the end of 2020, but by the end of 2021, Nigeria’s GDP growth rate stood at an impressive 3.26 per cent.

Furthermore, empirical studies on the relationship between budget deficit and economic growth have been inconclusive. Studies such as Sawyer (2010), Odhianbo, Momanyi, Othnon

and Aila (2013) showed that budget deficit has a positive relationship with economic growth whereas studies such as Fatima, Ahmed and Rehman (2012), Hassan, Nassar and Liu (2014) as well as Sheikh, Saeed and Qanmer (2015) showed that budget deficit has a negative relationship with economic growth. Similarly, studies such as Vuyyuri and Seshaiah (2004) and Wosowei (2013) affirmed that budget deficit and budget reforms impact insignificantly on economic growth. On the other hand, a study by Hassan, Nassar and Liu showed a significant impact of budget deficit on economic growth. These inconclusive results makes it difficult to reach a general conclusion on the relationship between budget deficit, budget reforms and economic growth in Nigeria.

Based on these, this study seeks answers to this research question: what is the impact of budget deficit and budget reform on economic growth in Nigeria?

The main objective of this paper is to investigate the link between budget deficit, budget reforms and economic growth in Nigeria. The paper is divided into five parts. The second section examines related literatures after this introduction. The third part talks about the methodology. The results and discussion of the findings are presented in Section 4, and the conclusions and recommendations for the future are made in Section five.

2. Literature review

Empirical Literature

Amade and Oyigebe (2024) investigated the impact of Budget Deficit on economic growth of Nigeria between 1983 and 2023. Real Gross Domestic Product (RGDP) was used as the explained or dependent variable proxy for economic growth. budget deficit (BDF), inflation (INF) and money supply (MS) all represent explanatory or independent variables. The study employed Auto Regressive Distributed Lag (ARDL) Model which was used to analyzed and evaluate the coefficients of the model's parameters. Other diagnostic tests employed by this study include; unit root test, descriptive statistics, correlation coefficient matrix, Cointegration test and test of Normality, and they confirmed the validity and reliability of the model used; the inferential results showed that budget deficits impacted significantly on the economic growth of Nigeria under the review period.

Usman, Agunbiade and Akuso (2024) examined public budget deficit financing and economic growth in Nigeria using time series data for the period of 1986 to 2021. The study uses Non-Linear Autoregressive Distributed Lag (NARDL) as its estimation technique. Dialectically, the study reveals that public budget deficit financing sources such as; treasury bills, treasury bonds, multilateral debt, bilateral debt, oil revenue to total revenue ratio, non-oil revenue to total revenue ratio and external reserve had significant positive and negative impacts on economic growth in the Nigerian economy within the study period. However, specifically, public budget deficit financing sources such as; treasury bills, treasury bonds, oil revenue to total revenue ratio, non-oil revenue to total revenue ratio and external reserve have asymmetric impacts on economic growth in the Nigerian economy within the period under review.

Adebowale (2021) empirically investigated the asymmetries in the relationship between Nigeria's budget deficit and economic growth from 1986 to 2020. The Central Bank of Nigeria Statistical Bulletin (2020) was the source of the time series data used in the study. For data analysis, the study utilizes the Non-linear ARDL model developed by Shin et al. (2014). The findings show that budget deficit affect economic growth both in the short and long run negatively which makes this work a landmark since previous studies were unable to capture this aspect of non-linearity.

Chukwu, Otiwu and Okere (2020) explored the impact of budget deficit on economic growth of Nigeria, covering the period,1980-2019.The study uses time series data sourced from the Central Bank of Nigeria Statistical Bulletin (2019). The unit root, granger causality, and co-integration tests were used in two Stage Least Square Data analyses to produce five statistically significant models: the budget deficit and economic growth model, the budget deficit and real interest rate effect model, the budget deficit and inflation rate effect model, the budget deficit and investment effect model, and the budget deficit and real exchange rate effect model. Budget deficits were discovered to have a significant negative relationship with GDP growth rate, real private investment, inflation rate, real exchange rate, and a significant positive relationship with real interest rates

George and Kosimbei (2019) assesses budget deficits and economic growth in Nigeria. The study uses annual time series data sourced from World Development Indicator (2017) for the period 1963 to 2017. The study utilizes current account of the balance of payments, private

consumption, private investments, money supply, treasury bill rates, and real GDP as variables of interest. The study underpinned Mundel- Fleming model and Vector Auto-Regressions (VARs). The study establishes that the budgeting process had loop holes which perpetrated budget deficits. Also, the sources of budget deficits includes: level of economic development, growth of revenues, instability of government revenues, government control over expenditures and the extent of government participation in the economy. The Impulse Response Functions (IRFs) reveals that budget deficits have a significant effect on: private consumption, private investments, money supply (M3), treasury bills rate, current account and real GDP.

While research on the relationship between budget reform, budget deficit, and economic growth is ongoing in developing economies, it is well-documented in industrialized economies. For example, Gale and Orszag (2003) conducted a review study in light of recent research and policy debates to determine the economic effects of administrative budget policies and sustained budget deficits. The study came to three conclusions: first, budget deficits reduce future national income and national saving; second, deterioration in the quality of current budget policies implies a significant decline in future national income; and third, after controlling for other factors, expected future deficits tend to find significant effects of expected deficits on current long-term bond yields.

Vuyyuri and Seshaiah (2004) used time series data from the Bank of India from 1970 to 2002 in an attempt to determine the relationship between GDP, budget deficit, and budget reform (dummy variable). The Granger causality test results indicated a unidirectional causal relationship between GDP, budget deficit, and budget reforms. There was no significant relationship between Budget reforms, budget deficit, and GDP based on the result of the vector error correction model (VECM).

In order to validate the Kelectian model, Sawyer (2010) conducted a study to ascertain how budget deficit policy might reduce inequality in order to promote economic growth. One of the most important insights of Keynesian-Kelectian macroeconomics is the Kelectian model, which explains that market forces are weak and would not ensure the necessary aggregate demand for growth. As a result, the model takes into account the role of budget reforms to increase government spending and investment through taxation as a means of guaranteeing sustainable adequate demand in a capitalist economy. According to the model's findings, policies

that encourage budget deficits and tax savings have a positive effect on income redistribution and growth.

Time-series covering the years 1978–2009 were utilized by Fatima, Ahmed, and Rehman (2012) to determine the ensuing consequences of Pakistan's budget deficit on economic growth. The regression analysis's findings demonstrated that the budget deficit had a detrimental effect on economic growth In particular, the findings showed that a 1% increase in the budget deficit results in a 0.11 percent drop in GDP.

Using annual time series data from 1970 to 2007, Odhiambo, Momanyi, Othuon, and Aila (2013) examined the relationship between Kenya's budget deficits and economic growth. In line with Keynes' postulation, the OLS regression's results indicated a positive effect between budget deficits and economic growth.

Akosah (2013) used data from 2000 to 2012 to determine the threshold effects of budget policy shifts and the budget deficit on economic growth in Ghana. They discovered that budget reform policies that promote a high budget deficit, driven by recurring expenditures, slow down economic growth, supporting the primary fiscal convergence criterion of the West African Monetary Zone (WAMZ), which calls for a budget deficit that does not exceed a threshold of 4 percent. As was the case with Ghana in the study, the study came to the conclusion that budget reform policies that promote budget deficits more than 4 percent of total budget are harmful to the growth of West African nations. Thus, economic growth was not being aided by budget deficits or reforms.

Using data from 1930 to 2010, Hassan, Nassar, and Liu (2014) conducted a time series model on the United States to ascertain the impact of government deficit spending on GDP, controlling for inflation, unemployment, and interest rates. The authors concluded that budget deficits have a significant impact on the economic performance of the United States economy because the results of the multivariate time series modeling using the transfer function approach showed that there were negative and significant effects between GDP and the budget deficit in the US for the study period, while the control variables were found to be insignificantly related with GDP.

The relationship between Nigeria's budget deficit and macroeconomic factors, particularly growth, is examined in Wosowei's (2013) paper. Using the OLS approach, the study used data from 1980 to 2010 that covered 31 years. The results showed a bi-directional relationship between GDP, unemployment, and taxation and budget deficits. In particular, the regression's findings demonstrated that, despite a negative relationship between growth and the budget deficit, it was not statistically significant.

Osuka and Chioma (2014) conducted another study in Nigeria that used time series data from 1981 to 2012 along with additional variables such as interest rate, nominal exchange rate, and inflation rate to determine the relationship between budget size, budget deficit, and macroeconomic variables. From the Granger causality result, Budget size, budget deficits, and GDP have a unidirectional granger-causality, with GDP granger causing budget deficit and budget size.

Tung (2018) used an error correction mechanism (ECM) to analyze 14 annual observations (2003-2016) to investigate the impact of Vietnam's fiscal deficit on economic growth. The analysis's conclusion was that there is a co-integration link between economic growth and the budget deficit. Regression analysis revealed a negative relationship between fiscal deficits and growth, which extends to private investments.

Kilindo (2017) conducted a study with the goal of outlining policy choices for Tanzania's monetary growth, inflationary developments, and government budgetary operations. Five equations made up the structural model used in the study. These included the supply of money equation, the price equation, the government revenue and spending equation, and a definitional equation that explains how expectations are formed. The analysis found a significant relationship between inflation, money supply, and fiscal operations. According to the policy, a restrictive monetary policy should be implemented, which would limit the money supply's ability to increase at the same rate as real output.

Theoretical framework

i. Neoclassical School Theory

The neoclassical hypothesis assumes that budget deficits and economic performance are related. It assumes that the budget deficit and economic performance are negatively

correlated. According to Easterly, Rodriguez, Schmidt-Hebbel (2014), they based their argument on the fact that budget policies that promote increases in government spending not only boost aggregate demand but also lead to intense competition between the government and private investors for available loans. Interest rates in the economy rise as a result of this policy change. Additionally, it raises inflation and current account deficits and deters the issuance of private bonds, investments, and spending. As a result, the private sector's available capital is crowded out, leading to poor economic performance (Ashauer, 2015).

ii. Ricardian Equivalence Hypothesis

An extreme situation within the twin deficit hypothesis is assumed by the Ricardian Equivalence Hypothesis, which is a deduction from it. According to the Ricardian Equivalence Hypothesis (REH), there is no connection between the current account deficit and the budget deficit (Rosen & Gayer, 2014). The Ricardian goes on to say that tax cuts, which tend to lower public revenue and savings, are the primary cause of the budget deficit. According to their opinion, people will automatically increase their savings rather than their consumption since they will see these tax cuts as resulting in future tax liabilities (Arrow, 2004).

iii. Theory of public option

The study of the public option theory begins with the assumption that citizens are the "principals" and the government is the "agent." It depends on the microeconomics of citizen-government productivity. The theory develops two functions to explain the budget process and changes, assuming both sides to be rational. These models are the agent offer model and the principal demand model. In this case, the primary demand is the government's desire to satisfy the demands of the populace in the economy. The approach focuses on the real services that the government offers its residents from the authorized budget (Rodrik, Acemoglu, & Johnson, 2010).

3. Methodology

The study equation is anchored on the Augmented Solow's model. In line with that, the economic growth model originates from the Augmented Solow's model as stated thus:

$$Y = A\, K^{\alpha}\, L^{\beta}\, h^{\delta} \qquad (3.1)$$

where:

Y= Output

K= capital input

L= labour input

A= state of productivity in the economy and an increase in A will result to increase in K, L;

h= to represent other variables

$\acute{\alpha}$ = capital share of output

β = labour share of output

$^{\delta}$ = technical/policy progress share of output

In this study, (Y), which represents the output; can be expanded to capture economic growth based on Dinopoulos and Thompson (2012) work as stated. Equation 3.1. is restated as thus; (Y) to capture the indicator of economic growth in Nigeria as follows:

$$RGDP = f\ (A, Capital, Labour, h^{\delta}) \quad 3.2$$

where:

Y = output (represented as RGDP)

A = state of technical progress (represented as BRI)

K = Capital (represented as Budget Deficit)

L = Labour (represented as Labour Force)

h, $^{\acute{\alpha}\beta\delta}$ = used as earlier stated

Equation 3.2 is further extended to incorporate additional explanatory variables denoted by (h) in accordance with the Public option theory and the Ricardian Equivalence Hypothesis (REH) option. This REH takes into account how the budget deficit affects output through the interest rate and exchange rate at the same time. Public option theory, on the other hand, addresses institutional problems like the budget reform index as well as policy advancement. According to public option theory, economic performance is impacted by budget reforms (budget reform index) and other economic policy tools used by the government (agents) on behalf of the nation's residents (principals) (Villanueva, 2006).

These new variables give Equation 3.3 as thus:

$$RGDP_{it} = f\ (\ BRI_{t1},\ BDF_{t2},\ LABF_{t3},\ INT_{t4},\ EXR_{t5}, OPN_{t6}\ ) \quad 3.3$$

where:

$RGDP_{it}$ = Real Gross Domestic Product

BRI_{t1} = Budget Reform Index

BDF_{t2}	=	Budget Deficit
$LABF_{t3}$	=	Labour Force
$INTR_{t4}$	=	Interest Rate
EXR_{t5}	=	Exchange Rate
OPN_{t6}	=	Openness

Therefore, the budget deficit-reform economic growth model is econometrically expressed as:

$$RGDP_{it} = \beta_0 + \beta_1 BRI_{t1} + \beta_2 BDF_{t2} + \beta_3 LABF_{t3} + \beta_4 INTR_{t3} + \beta_5 EXR_{t5} + OPN_{t6} + \mu_1 \quad 3.4$$

where;

$\beta_1 > 0$, $\beta_2 < 0$, $\beta_3 > 0$, $\beta_4 > 0$. $\beta_5 > 0$ and $\beta_6 > 0$

μ_1 = Stochastic error term

The VECM specification can be expressed as:

$$\Delta Y_t = \alpha_0 + \alpha_1 \Delta Y_{t-1} + ... + \alpha\rho\Delta Y_{t-\rho} + \beta_0 \Delta X_t + \beta_1 \Delta X_{t-1} + ... + \beta\rho\Delta X_{t-\rho} + \theta e_{t-1} + U_t$$

4. Results and Discussions

Table 1: Test for unit root using Augmented Dickey-Fuller (ADF) test

Variable	**Level**	**Critical value at 5%**	**1st Difference**	**Critical value at 5%**	**Remarks**
BDF	2.780591	-2.943427	-3.751278	-2.945842	I(1)
BRI	-2.420787	-2.943427	-6.601556	-2.945842	I(1)
EXR	2.421424	-2.943427	-3.324048	-2.945842	I(1)
INTR	-0.011797	-2.943427	-4.631338	-2.945842	I(1)
LABF	1.500539	-2.943427	-5.514794	-2.945842	I(1)

OPEN	-2.238366	-2.943427	-7.492310	-2.945842	I(1)
RGDP	-0.466789	-2.945842	-3.197068	-2.945842	I(1)

Source: Author's computation, (2023)

Table 1 above presents unit root test results based on Augmented Dickey-Fuller (ADF) test. The results showed that the variables were not stationary at level. Therefore, the null hypothesis of no unit root cannot be rejected. However, the variables were all stationary when they were differenced once. That means they were integrated of order one; i.e. I (1). Given that the variables are mutually integrated, that is the variables are either I (0) or I (1), the standard VAR model estimation at level not suitable in this case. The vector error correction (VECM) is therefore suitable and hence the specified model is estimated in the VAR variant.

Table 2 Optimal lag Selection criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
1	-204.5802	NA	0.003208*	14.08779*	16.24313*	14.84006*
2	-165.2820	48.03110	0.007184	14.62678	18.93747	16.13132

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Author's computation, (2023)

The first step of running the VECM is to decide on the lag length of the model. This study used the Akaike information Criterion (AIC) in the lag selection. The optimal lag selected for the equation is lag one (1), and the result is presented in table 2 above.

Table 3: Cointegration result (Trace and Max. Eigenvalue Tests)

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**

None *	0.682787	127.8762	95.75366	0.0001
At most 1 *	0.572864	87.68991	69.81889	0.0010
At most 2 *	0.464155	57.91706	47.85613	0.0043
At most 3 *	0.408970	36.08022	29.79707	0.0083
At most 4 *	0.276519	17.67414	15.49471	0.0231
At most 5 *	0.165810	6.345286	3.841466	0.0118

Trace test indicates 6 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.682787	40.18634	40.07757	0.0486
At most 1	0.572864	29.77286	33.87687	0.1430
At most 2	0.464155	21.83683	27.58434	0.2289
At most 3	0.408970	18.40608	21.13162	0.1154
At most 4	0.276519	11.32885	14.26460	0.1385
At most 5 *	0.165810	6.345286	3.841466	0.0118

Max-eigenvalue test indicates 2 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Source: Author's computation, (2023)

The result reveals that. there are six (6) cointegrating equations in the trace test at five percent level of significance. This means that, in the six (6) co-integrating equations, trace statistical value is greater than the critical values at five percent level of significance. In the same manner, the maximum eigenvalue test also reveals the existence of two (2) cointegrating equations at five percent level of significance. Since we can establish at least one cointegrating equation at five percent level of significance, the null hypothesis of no cointegration is rejected as against the alternative hypothesis of the existence of cointegration, which we accept based on the results. It can therefore be concluded that the variables are co-integrating and hence exist a long run relationship among the variables in the model.

Vector Error Correction Result

Analysis of Vector Error Correction for the Economic Growth Equation

Table 4 : Vector Error Correction Result for Economic Growth Equation

Source: Author's computation, (2023)

Error Correction:	D(LRGDP)	D(BRI)	D(BDF)	D(LLABF)	D(LEXR)	D(INTR)	D(OPEN)
CointEq1	-0.301285	-0.807657	-647.1899	0.142880	1.859450	-5.523309	45.96029
	(0.07129)	(2.01055)	(1942.70)	(0.10213)	(0.78603)	(24.2293)	(53.5075)
	[-4.22636]	[-0.40171]	[-0.33314]	[1.39905]	[2.36563]	[-0.22796]	[0.85895]
D(LRGDP(-1))	0.308156	-4.043786	-332.6916	0.032594	1.546950	-27.23931	83.33056
	(0.13804)	(3.89323)	(3761.84)	(0.19776)	(1.52206)	(46.9176)	(103.612)
	[2.23236]	[-1.03867]	[-0.08844]	[0.16482]	[1.01635]	[-0.58058]	[0.80426]
D(BRI(-1))	0.015973	0.055197	73.36378	-0.014795	-0.010798	4.504837	-1.776529
	(0.01015)	(0.28631)	(276.647)	(0.01454)	(0.11193)	(3.45033)	(7.61965)
	[1.57347]	[0.19279]	[0.26519]	[-1.01733]	[-0.09647]	[1.30562]	[-0.23315]
D(BDF(-1))	0.575886	-0.000208	0.413994	-1.97E-07	0.000111	0.001420	-0.003667
	(0.48689)	(0.00021)	(0.19904)	(1.0E-05)	(8.1E-05)	(0.00248)	(0.00548)
	[1.18278]	[-1.01191]	[2.07991]	[-0.01878]	[1.38360]	[0.57208]	[-0.66894]
D(LLABF(-1))	0.097416	-2.301282	-1298.229	0.134566	1.068135	34.52598	-14.95017
	(0.13218)	(3.72790)	(3602.08)	(0.18936)	(1.45743)	(44.9251)	(99.2118)
	[0.73700]	[-0.61731]	[-0.36041]	[0.71064]	[0.73289]	[0.76852]	[-0.15069]
D(LEXR(-1))	0.036089	-1.333084	228.2618	-0.011089	-0.131478	-1.462535	8.810536
	(0.01777)	(0.50122)	(484.306)	(0.02546)	(0.19595)	(6.04026)	(13.3392)
	[2.03072]	[-2.65966]	[0.47132]	[-0.43554]	[-0.67097]	[-0.24213]	[0.66050]
D(INTR(-1))	-0.001208	0.003330	1.863572	-0.001037	0.014460	-0.470289	0.575886
	(0.00065)	(0.01830)	(17.6776)	(0.00093)	(0.00715)	(0.22048)	(0.48689)
	[-1.86271]	[0.18204]	[0.10542]	[-1.11574]	[2.02173]	[-2.13307]	[1.18278]
D(OPEN(-1))	-0.000286	0.006632	-0.128444	-0.000601	0.002927	0.081359	-0.088869
	(0.00031)	(0.00866)	(8.37023)	(0.00044)	(0.00339)	(0.10439)	(0.23054)
	[-0.93104]	[0.76562]	[-0.01535]	[-1.36616]	[0.86428]	[0.77935]	[-0.38548]
C	0.008593	0.197463	-62.10086	0.007891	0.057923	0.512952	-2.060127
	(0.00392)	(0.11050)	(106.775)	(0.00561)	(0.04320)	(1.33170)	(2.94090)
	[2.19313]	[1.78691]	[-0.58160]	[1.40581]	[1.34074]	[0.38519]	[-0.70051]
R-squared	0.704341	0.284257	0.193649	0.372270	0.283233	0.336082	0.218260
Adj. R-squared	0.616739	0.072185	-0.045270	0.186276	0.070858	0.139365	-0.013366

Sum sq. resids	0.003511	2.792930	2607587.	0.007206	0.426879	405.6110	1978.143
S.E. equation	0.011404	0.321624	310.7689	0.016337	0.125739	3.875904	8.559471
F-statistic	8.040191	1.340380	0.810522	2.001518	1.333645	1.708456	0.942295
Log likelihood	115.1541	-5.066089	-252.5093	102.2122	28.74412	-94.67555	-123.1969
Akaike AIC	-5.897452	0.781449	14.52829	-5.178456	-1.096895	5.759753	7.344272
Schwarz SC	-5.501572	1.177329	14.92417	-4.782577	-0.701016	6.155632	7.740151
Mean dependent	0.018237	0.030441	-100.6109	0.008029	0.076384	0.104167	0.387774
S.D. dependent	0.018420	0.333901	303.9648	0.018111	0.130446	4.177953	8.502835

The result of the vector error correction mechanism (VECM) as presented in table 4, has a correct negative sign and also statistically significant. This is in line with theoretical expectation. Also, as depicted in the table, the error correction variable has expected negative coefficient of 0.3013, which implies that the previous year error would be corrected in the following year at an adjustment rate of 30.13 per cent. This result indicates a slow speed of adjustment from the disequilibrium in the short run to equilibrium in the long run.

Furthermore, the high value of R-squared of 0.7043 shows that the overall model has a good fit and a high explanatory power. Specifically, the R-squared of 0.7043 shows that about 70 per cent of the total variations in the dependent variable has been explained by the independent explanatory variables. This implies that, the model has a good fit on the data and has relatively high explanatory power.

In the same vein, the F-statistic value of 8.0402 showed that the overall model is statistically significant at five per cent level of significance. This is because the F-statistics calculated value of 8.0402 is greater than the critical value of 2 at five per cent level of significance. This means that the explanatory variables have joint impact on the dependent variable in the model, during the evaluation period.

Similarly, the analysis of the short run coefficient showed that one period lagged value of real gross domestic product has positive relationship with the current value of real gross domestic product in Nigeria in line with theoretical expectation. This means that a one per cent increase in the one period lagged value of real gross domestic product led to an increase in the value of the current real gross domestic product by 0.3082 per cent ceteris paribus. It is also statistically significant. This is because the calculated t-statistic value of 2.2324 is greater than the critical value of 2 at five per cent level of significance.

Again, previous one period lagged of budget reform index exerts a positive impact on real gross domestic product. This means that a one per cent increase in previous one period lagged of budget reform index resulted to an increase in economic growth by 0.0160 per cent. This result is also consistent with apriori expectation.

The coefficients of one period lagged of budget deficit is positive, indicating a positive relationship between budget deficit and economic growth in Nigeria. This implies that an increase in budget deficit leads to an increase in economic growth. The result conforms to apriori expectation using the Ricardian equivalence theorem, because a one per cent increase in previous one lagged of budget deficit led to an increase in real GDP by 0.5759 per cent, ceteris paribus.

Also, the empirical result showed that labour force has a positive impact on economic growth in Nigeria in the first period. This is in line with apriori expectation. This is because in real term, a one per cent increase in one period lagged of labour force is supposed to have a positive impact on output- here known as real gross domestic product. The one percent increase in one period lagged of labour force has a positive increase of 0.0974 per cent in real Gross Domestic Product.

Further examination of the result showed that one period lagged of exchange rate had a positive impact on economic growth in Nigeria. The result is not in line with apriori expectation, showing that a one per cent increase in previous one lagged of exchange rate resulted to an increase in real GDP by 0.03609 per cent, ceteris paribus.

Moreso, the empirical result of interest rate showed a negative impact on economic growth in Nigeria in the first period. This means that, a one per cent increase in the one period lagged of interest rate led to a decrease in real gross domestic product by 0.0974 per cent. The interest rate exerts a negative impact on economic growth which conforms to apriori expectation.

Finally, from the analysis of the result showed that there is negative impact of openness on economic growth in Nigeria. This result is not in line with relevant economic theory the result showed that a one per cent increase in one period lagged of openness resulted to a decrease in real GDP by 0.000286 per cent, other things being equal.

Test of Hypothesis

Ho: There is no significant impact between budget deficit, budget reform and real gross domestic product in Nigeria.

Decision:

From the result obtained the vector error correction model (VECM) estimates showed that budget reforms and budget deficit have a positive and significant impact on real gross domestic product in Nigeria. Therefore, we reject the null hypothesis and conclude that budget reforms and budget deficits have a positive and significant impact on economic growth in Nigeria.

Discussion of Findings

Firstly, one of the findings from the analysis of the VECM result indicates that budget deficit and budget reform have a positive and significant impact on economic growth in Nigeria. This finding conforms with related finding from the study by Gale and Orszag (2003) and in line with the REH theorem. The findings imply that an improved budget reform causes an increase in economic growth. Also, the option of budget deficit financing does not negate economic growth in Nigeria. This finding can also be rationalized by the position of IMF Reports (2018), that the outcomes of any budget reform should be such that the financial plan meets minimum solvency, stationarity and liquidity benchmarks causing any deficit finance to be optimally used. This therefore follows that, the Nigeria conscious budget reforms like Fiscal Responsibility Act 2007, Public Procurement Act, 2007, Nigeria Extractive Transparency Initiative and so on might have contributed to this minimal growth established by this study.

Furthermore, the findings from the study also revealed that, the one period lagged of budget reform index, one period lagged of budget deficit, one period lagged of exchange rate, and one period lagged of labour force had a positive impact on the current level of economic growth in Nigeria. This result agrees with the finding of Osuka and Chioma (2014), who investigated the budget deficit, macroeconomic variables nexus such as interest rate, nominal exchange and inflation in Nigeria and found positive relationship between this variables and real GDP in Nigeria. Although, Osuka and Chioma (2014) results, found a uni-directional granger-causality between budget deficit and real GDP, with real GDP granger causing budget deficit in Nigeria, buth that has been the opposite of the result of this work.

In line with the study, the study of Sheikh, Saeed and Qammer (2015), determines whether an approved budget framework dampen down economic growth for Ukraine, using annual time series data from 1971 to 2010 with the error correction technique within the Autoregressive distributed lag modelling framework (ARDL). The findings of the study showed a minimal positive effect of budget deficits on economic growth while years with budget surplus

affected growth positively but in greater proportion. The authors explained that budget deficits in Ukraine is as a result of tax system inefficiencies and unproductive government aggregate spending in debt repayments, defense and unnecessary expenditures on the Parliament which tilts towards the findings of this work.

Also, the results obtained from VECM analysis indicated that, one period lagged of interest rate and one period lagged of openness had a negative impact on economic growth in Nigeria. The result is consistent with findings of Wosowei (2013) who examined the fiscal deficit relationship with macroeconomic variables specifically growth and found a negative relationship between interest rate and openness on economic growth in Nigeria.

5. Conclusion and recommendations

Conclusion

In conclusion, this research study was conducted to empirically examine the impact of budget reforms and budget deficits on economic growth in Nigeria. Based on the findings in the study, the work concluded that budget deficit, budget reform has a significant impact on the economic growth of Nigeria.

Recommendations

Based on the findings from the study, the study makes the following recommendations:

(i) The study recommends that for improved economic growth, budget reform policies should be such that the ensure linkages of government expenditures ceilings to government revenue, external debt to current account balances and public debt to budget balances. On this basis IMF benchmarks for liquidity, solvency and stationarity can be meet.

(ii) The positive impact of budget deficit and budget reform on economic growth calls for more budget policy reforms that will encourage increase funding to sectors like education and health. These sectors enable growth in any economy. In the same manner, the share of capital expenditure to recurrent expenditure should be such that meets quick acid test ratio like in the 18 years of the study period. Increase government spending especially in budgetary allocation to capital expenditure in areas like education, health, power and housing. Budget reform policies like UBE Act 2003, TETF 2013 should be encouraged. It enhances sectoral allocation efficiency and stimulates economic growth in Nigeria.

Authors' contributions

Author ODE designed the study, performed the statistical analysis wrote the protocol and the first draft of the manuscript, and managed the analyses of the study, while Author IDI conducted the literature searches, read and approved the final manuscript.

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3.

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