

ASSESSMENT OF THE IMPACT OF GOVERNMENT REVENUE MOBILISATION ON ECONOMIC GROWTH IN NIGERIA

Comfort Omolayo Rotimi

Department of Economics, Federal University Lokoja, Kogi State, Nigeria

E-mail: layocomy@yahoo.com

Naphtali John

Department of Economics, Federal University Lokoja, Kogi State, Nigeria

E-mail: naphtali.watramarhyel@fulokoja.edu.ng

Mathew Ekundayo Rotimi*

Department of Economics, Federal University Lokoja, Kogi State, Nigeria

E-mail: mathew.rotimi@fulokoja.edu.ng

Mishelle Doorasamy

School of Accounting, Economics and Finance, College of Law and Management Studies,

University of KwaZulu Natal, Durban, South Africa

E-mail: doorasamym@ukzn.ac.za

(Received: November 2021; Accepted: February 2022; Published: October 2022)

Abstract: Inadequate revenue generation impedes economic growth. It retards the overall economic growth and behavior. It delays government decision formulation on expenditure. The issue has lacked attention from academics. Consequently, this study focuses on the relationship between revenue generation and economic growth in Nigeria. It employed time series data sourced from the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS) from 1981-2018. Contributing to the debate on the revenue mobilization and economic growth nexus, the study used multiple regression to estimate the impact of government revenue mobilization on economic growth in Nigeria. Findings revealed that domestic debts and non-oil (NOIL) revenue positively and significantly impact economic growth while external debts and oil revenue revealed otherwise. Based on the findings, the study concluded that government revenue impacts economic growth. Consequently, the study recommends economic diversification through strategic programs aimed at enhancing growth rather than remaining a mono-economy. Furthermore, it recommends that the government should review the existing revenue mobilization strategy— especially the multifarious non-oil

* Corresponding author: Mathew Ekundayo Rotimi. E-mail: mathew.rotimi@fulokoja.edu.ng

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Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

revenue bases to ensure improved revenue remittances. The study also recommended the need to formulate policies that will guarantee better utilization of both domestic and foreign loans with the aim of increasing productivity and enhancing revenue mobilization. It is also recommended that borrowing should be considered a last resort to fund government projects, and where it is unavoidable such borrowing should be limited to domestic debt (DD).

Keywords: Public Debts; GDP; Government Revenue; Taxation; Oil Revenue.

JEL CLASSIFICATION: F43, H71, O40.

1. Introduction

The process of economic growth of a nation relates to the ability of the nation to generate adequate revenue [1] and ensure effective utilization of such revenue (Okwori and Sule, 2016). However, the revenue and its sources, how they are mobilized, and how prospective changes of the sources of these revenues impact the overall economic growth have remained inconclusive, delaying decision formulation on government expenditure. The inappropriateness in revenue mobilization has led several nations into avoidable debts. Similarly, Sriyono (2014) noted that poor acceleration of investments through stabilization arising from weak revenue mobilization may account for poor economic performance. This appears worsened with the recent pandemic, Covid-19, leading several countries into financial difficulties, and even some nations experienced an economic slump. All state budgets are directed towards addressing the Covid-19 pandemic problem, especially the budget for discovering this virus vaccine and giving succor to citizens in affected areas (Hambali, 2020). While Nigeria continuously experiences upturns in revenue generation from various sources like oil and gas over the years, it relies largely on loans to finance its budget, yet, the economy is still characterized by stunted gross domestic product (GDP) and high indebtedness (CBN, 2018). As such, the economy accounts for high unemployment, low per capita income, low investment, high inflation rate and unfavorable balance of payment. For instance, the unemployment rate jumped from 4.2 percent in 1999 to 22.6 percent in 2018 and later moved up to 23.1 percent in the first quarter of 2019 and 2020, it rose to 27 percent (NBS, 2020). The inflation rate increased from 6.6 percent in 1999 to 16.5 percent in 2017 and later dropped to 12.1 percent in 2018 and 13 percent in 2020 (NBS, 2020). The trend raises the question of whether government-generated revenues are impactful on economic growth. Following this view, this study at first investigated the impact of aggregate government revenue on economic growth in Nigeria and secondly, it evaluated revenue patterns and trends in Nigeria.

Notwithstanding, there are few attempts to deepen the understanding of the correlation between revenue sources in Nigeria and economic growth (see Okwori and Sule, 2016; Egbunike, Emudainohwo and Gunardi, 2018). These studies have

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

come to conclude that, there is no adequate revenue collection system in Nigeria that could ascertain matching income with expenditure. This manifestation, most time, puts the government under pressure to meet its obligations to the citizenry. In another word, the inconclusiveness of studies on revenue and economic growth nexus is of vital concern to researchers and policymakers because inadequacy of revenue hinders the government from financing its economic, social, and political obligations which constitute a cardinal objective. This in turn catalyzes growth.

The literature reveals that tax revenue, amidst many sources of government funds, constitutes the main source of government revenue globally (see Mudayen and Maridjo, 2018; Ama and Omodero, 2017; Sule, 2016; Nwosu and Okafor, 2014). Conversely, various studies have also identified oil proceeds, grants, national savings, aid, and debts as essential sources of government revenue (Okwori and Sule, 2016; Onyele and Nwokoacha, 2016). According to Nzotta (2007), the tax system constitutes one of the very effective and efficient ways of generating internal revenue for the government. Buttressing this claim, Onyele and Nwokoacha (2016) state that taxes consist of the key sources to finance the federation account, which is allocated to the three tiers of government.

Giving an overview of taxation in Nigeria, Ogundele, as cited in Onyele and Nwokoacha (2016), referred to taxation as a practice in which residents of any given nation or society are mandated legally to pay a required portion of their earnings to carry out administrative and developmental activities in the society. While tax is expected to serve as a buffer to government expenditure, it has come with a few challenges discussed in the literature. They include accountability, professionalism, and awareness of municipals on the necessities and advantages of taxation in business and personal lives that include, facilitation of savings and investments, promoting economic activity, and creating strategic competitive benefit (Kiabel and Nwokah, 2009).

These problems also apply to the Nigerian context. For example, Okwori and Sule (2016) identified Nigeria as one of the most regressive developing nations with respect to harnessing revenues owing to weak governance, corruption, and mismanagement. Supporting this claim, Onyele and Nwokoacha (2016) identified poor tax administration, in addition to a high rate of evading tax among taxpayers (corporate and individual bodies) and heavy reliance on oil proceeds, as a key source of government revenue that has resulted to fiscal deficit and erratic economic performance. These identified problems have precluded the channel of the nation's resources obtained from taxation and other revenue sources into lasting advancements in a self-supporting economy like Nigeria.

According to Alade (2017), government revenue sources comprise privatization proceeds, taxes, interest received, sale proceeds of goods, the commission received, and rent received among others. In addition, the study noted that public revenue is

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

an important tool of fiscal policy. Despite these sources outlined and their expected contributions to the economy, Sanni (2007) noted that the fiscal operations of Nigeria over time have led to changing degrees of deficit finance and this had immense implications on the economy. So, the nation is always confronted with a rising budget deficit, causing a rising gap between public expenditure and generated revenue. According to CBN (2018), deficit financing remains high at ₦117.2 billion in 2007, ₦47.4 billion in 2008 and ₦810 billion in 2009. In 2010 the country recorded yet another increase in the deficit of ₦1105.4 billion. In 2011, it increased to ₦1158.5 billion and ₦975.8 billion in 2012. The deficit financing recorded in 2016, 2017 and 2018 were ₦2673.8 billion, ₦3609.4 billion and ₦3628.1 billion respectively.

According to Oniha (2020), Nigeria's debt profile since President Buhari came to power in 2015 is as follows: ₦1.4 trillion in 2015; ₦2.3 trillion in 2017; ₦1.6 trillion in 2018; and ₦1.6 trillion was proposed for 2019. Presently Nigeria owes ₦24.4 trillion, out of which 68.2 percent of the debt is domestic (Sahara reporters.com, 2019). The statistic shows that the oil GDP growth rate in Nigeria stood at 7.8 percent for the period spanning 1986-1993, dropped to 0.5 percent between 1994-1999, 4.8 percent between 2000-2002, and later increased to 6.4 percent for the period covering 2003-2008 and 8.1 percent and 10 percent in 2016 and 2017 respectively (NBS, 2020). The growth rate of non-oil GDP between the same periods was respectively 5.8 percent, 3 percent, 3.5 percent, and 8.8 percent with the corresponding total GDP growth rate between 1986-1993 standing at 6.2 percent, 1994-1999 at a rate of 2.3 percent, 2000-2002 at 4.8 percent and 2003-2008 at 6.4 percent. It is germane to understand that total oil proceeds generated was reported as ₦1413.7 billion in March 2019. This recorded a decrease from the previous sum of ₦1465.3 billion for December 2018. The oil revenue reached an all-time high amount of ₦2642.8 billion in September 2011 and a record low of ₦537.1 billion in June 2016 while non-oil revenue was reported at ₦946.9 billion in December 2018. This recorded an increase from the previous number of ₦814.5 billion in December 2017. The non-oil reached an all-time high amount of ₦1125.9 billion in September 2013 and a record as low as ₦138.9 billion in March 2005 (CBN, 2020).

This is an obvious indication that our capacity to generate revenue is exclusively dependent on oil proceeds even during several adjustments and applications of different types of tax revenue regulations. This situation signals a high level of ineptitude in the administration of tax in Nigeria. That is, it conflicts with the tax-and-spend hypothesis advanced by Friedman (1978). The hypothesis states that "changes in government revenue bring about changes in government expenditure with the sole aim of bringing growth in the economy". Also, Naiyeju (1996) avowed

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

that the failure or success of a tax system relies on the degree that it is appropriately managed, and how tax law is appropriately interpreted, and executed.

Furthermore, Dickson and Presley (2013) ascribed the shortcomings to an extraordinary extent of tax evasion, corrupt practices in the administration of the tax system, and misguided tax exemptions. Notwithstanding the great growth recorded in revenues from oil, the question remains, whether the government has fully applied generated revenue for the general development of economic activities. In view of this, Storey (1953) asserted that "before independence, there have been cases of official misuse of resources for personal enrichment". Evolving from this persistent discrepancy, one would be right to quiz the outlook of generating revenue- the Gross Domestic Product (GDP) and its associated rate of growth within the framework of the 2009 global economic recession, the 2014 economic recession in Nigeria and currently the instability of crude oil prices in the global market with its disturbing impact on revenue base.

Excellent fiscal policy – Fasano and Wang (2002), Wolde-Rufael (2008), and Eita and Mbazima (2008) note that it is indispensable to bring about improved sources of revenue generation to ensure workable economic growth. Buttressing this assertion, Wicken and Uctum (1990) argue that the ability to sustain a fiscal deficit profile is important to stimulate growth. On so many occasions, when the expected revenue is greater than expenditure, it is expected that the economy will be stimulated. Unfortunately, the reverse is Nigeria's situation, given the extreme and over-bloated governance cost. Consequently, Ariyo (1993) asserted that in the long run, considering the current trend, Nigeria might be unable to endure the degree of its fiscal deficit.

Consequently, this study presented an explicit thought on revenue mobilization and economic growth nexus in Nigeria. Findings seek to assist policymakers in making a decision relating to revenue mobilization. In addition, this study adds to knowledge by revealing the workings of the economy in terms of the interaction between revenue generation, and economic growth. Researchers and policymakers will find this study relevant to decision-making on revenue generation and its applications to ascertain economic growth. The remainder of this study is discussed in six sections. Section two gave an overview of tax and taxation in Nigeria. Sections three and four respectively reviewed the literature and presented the research methodology. Estimations and results are presented in section five and section six presented the summary, conclusions, and recommendations.

2. Theoretical framework and hypotheses

There are a few taxation theories available in public economics. These theories guide governments (national, regional, and local), at all levels on how to generate revenue from different sources to fund public-sector expenditures. It argues that several

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

governments generate funds, through several sources, to provide public services or to finance transfer payments. Therefore, these theories offer explanations and guide to government taxation and procedure therein. According to Okwori and Sule (2016), taxation is the commonest revenue source in various economies of the world. Consequently, this study is guided by the dynamic theory of taxation, public spending, and debt theory.

Dynamic Theory of Public Spending, Taxation, and Debt (DTPSTD)

The DTPSTD theory is built on a tax smoothing technique for fiscal policy initiated by Barro (2002). It argues that government surpluses and deficits budget is used as a buffer to avert tax rates from a sharp change.

The theory advocates for political jurisdiction upon which policy choices are decided by the legislature which has been elected from a well-defined geographical constituency. The legislature could generate revenues in two ways- borrowing [2] from the capital market and proportional tax on labor income. Bond purchases and interest earnings are other means that the legislature uses to finance future public spending. Public goods benefiting the citizens are financed with public revenues. It is also used to fund targeted district-specific transfers. The transfers are referred to as pork-barrel expenditure. The value of public good to the citizens is stochastic. It reflects shocks like natural disasters or wars.

Government Revenues are all the earnings or income accrued to the government to finance its obligations. They include revenues from customs duties, taxes, capital revenues, foreign aid, grant, and revenue from state-owned enterprises. According to Ahmed (2010), revenue means all the amount of money that the government externally sourced. For instance, those revenues originate from "outside the government net of refunds", and other amending transactions, issuing of debt proceeds, and intra-governmental transfers, private or agency trust transactions, and proceeds from the sale of investments.

There are two major revenue sources in Nigeria. They are oil and non-oil revenues (Ihendinihu, Ebieri, and Amaps, 2014). Oil revenue is the sum of money generated from crude oil sales to both consumers within a country and people in foreign countries. Oil revenue, therefore, includes joint venture cash (JVC) called royalty, Petroleum Profit Tax (PPT), Nigerian National Petroleum Corporation's (NNPC) earnings from direct sales, oil rent, sales of gas, proceeds from the domestic market, pipeline licenses, crude oil sales, penalty from gas flared, Value Added Tax (VAT) on domestic crude oil, and excise duties. Non-oil revenues, on the other hand, include revenues that are not derivable from oil or related to oil. They include Company Income Tax (CIT), customs and excise duties, VAT, sales tax, levies, personal income tax, grants, public debt, education tax, aids among others (CBN, 2018).

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Illyas and Siddiqi (2010) identified taxes and non-taxes as the two major sources of revenue. According to the study, taxes are identified as the foremost and first sources of public revenues. They refer to tax as a compulsory levy or payment that the government imposes on the citizens to generate income to finance its obligations. The taxpayers pay taxes to the government disregarding return or direct benefit from it. The government collects revenue through direct and indirect taxes [3]. Other types of revenue collected by the government include non-tax revenues. The non-tax revenues are revenues collected by the government from other sources different from tax. The non-tax revenues, among others, are penalties, fines, excess from public enterprises, fees, gifts, grants and deficit financing (Okwori and Sule, 2016).

In this study, the sources of revenue are limited not to oil and non-oil revenues or tax and non-tax revenues. The study also captured public debts as one of the sources of revenue for the government. Public debts consist of foreign and domestic borrowings. This includes loans from domestic financial institutions, multilateral establishments, and foreign grants (Okwori and Sule, 2016). Local and State governments are allowed to issue debt instruments. A debt instrument that is presently in issue includes Nigerian treasury bills, treasury bonds, and federal government development stocks. Among the treasury bills, development stocks are negotiable and marketable, but treasury bonds and means advances are unmarketable but it is solely held by the central bank of Nigeria (CBN) (Onyeiwu, 2011). Nigeria's internal debt aims at evading the likely risks that are associated with external borrowings, motivated by increasing government expenditures vis-a-vis dwindling government revenues complement the domestic savings for productive activities via infrastructural expansion as well as managing other macroeconomic environments of the nation (Adofu and Abula, 2010). Nigeria's foreign debts come majorly from multilateral agencies. The agencies, among others, include the London Club of Creditors, Bilateral and Private Sector Creditors, Paris Club of Creditors, and Promissory Note Holders.

Anyanwu and Oaikhenan (1995) defined economic growth as an increase in the country's economic capacity to manufacture goods and services required to better the well-being of the people over time. The International Monetary Fund (2009) defined economic growth as an increase in the number of goods and services manufactured in an economy at a time. Conventionally, economic growth is calculated as the percent rate of rising in the real GDP. It is commonly measured in real terms, using inflation-adjusted terms. The inflation-adjusted element nets out the impact of inflation on the general price level of the produced goods and services. According to Nwanna and Nkiruka (2019), economic growth could be either negative or positive. Following their study, negative economic growth means that the economy is shrinking. A shrinking economy is associated with economic

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

depression and recession. Positive economic growth, on the other hand, means an increase in productivity, economic output, and money supply.

There are a few theories explaining economic growth. The theories focus on growth and explain growth as a function of the productivity of factors of production. According to the theories, economic growth is a function of the number of production factors. The production factors are decided by total growth in labor productivity, change in population, rise in land and investments. According to Okwori and Sule (2016), the Harrod-Domar model reveals that a GDP growth rate equals the Savings-Capital Output ratio. Similarly, the Kaldor model of distribution reveals that the growth process depends on the savings-income ratio.

This study also selected a few related empirical studies which investigated the relationship between government revenue and economic growth. The literature review is not limited only to studies on Nigeria but beyond. It focused on diverse results from other countries.

Nsebot (2004) used a multiple ordinary least square (OLS) regression model to examine how revenue fluctuations impacted economic growth in Nigeria from 1970 to 1999. The study showed that the sum of federally collected revenues significantly impacts economic growth. In addition, the standard deviation of the sum of federally collected revenues positively influenced economic growth, contrary to the a priori expectation. Furthermore, the results further showed that the tax base could be changed to increase revenue without varying the rates since the tax to revenue coefficient is elastic.

Medee and Nenbee (2011) used Error correction mechanism (ECM) and Vector Autoregression (VAR) techniques to examine the impact of fiscal policy on economic growth in Nigeria from 1970-2009. The study showed that tax revenue positively impacted GDP in both the short run and long run.

Ibeh (2013) employed the OLS regression method to examine how oil revenue impacted the economic growth of Nigeria from 1980-2010. The study found that oil revenue has not significantly contributed to the Nigerian economic growth. Akinlo (2012) examined how oil is important in the Nigerian economic development from 1960 to 2009. Employing a multivariate VAR model, he found that oil adversely affected the manufacturing sub-sectors. Similarly, Baghebo (2012) investigated how petroleum impacted Nigerian economic growth. The study, employing data covering 1980-2011, found a long-run association between oil revenue and Nigerian economic growth. Worlu and Nkoro (2012) used secondary data from 1980 to 2007 to assess the impact of tax revenue on the Nigerian economic growth. They used a three-stage least squares estimation technique and found that through infrastructural development, tax revenue stimulates economic growth.

Ude and Agodi (2014) employed co-integration and ECM on time series data spanning 1980-2013, to examine the role of non-oil revenue on the Nigerian

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

economic growth. The non-oil revenue variables included manufacturing revenue and agricultural revenue. The study found that interest rate and revenues from manufacturing and agricultural sectors significantly impacted economic growth in Nigeria. Furthermore, the result revealed that there is a long-run equilibrium relationship in the model, and a short-run dynamic adjustment with a speed of 0.52 to restore equilibrium.

Muriithi (2017) employed a descriptive research design to investigate the connection between the Kenyan government revenue and its economic growth. The study reported an inverse relationship between import duty and economic growth. Regarding excise duty, he argued that a rise in excise duty impedes the economic growth rate. On income tax, he found that established income tax led to a continuous rise in revenue that the government obtained. In addition, this study found a direct relationship between economic growth and income tax. It also noted that a rise in the VAT rate will lead to a positive impact on economic growth. The conclusions showed a positive relationship between economic growth and government revenue, though, at a slow pace.

While the empirical findings on the relationship between government revenue and economic growth reviewed in this study are dated back to data obtained up till 2013, this study adds to knowledge by considering an assessment of the impact of government revenue mobilization on economic growth in Nigeria from 1981-2018.

3. Research methodology

Following Okwori and Sule (2016), this study employed both descriptive and quantitative techniques to examine the impact of government revenue on economic growth in Nigeria.

3.1 Research Design

The study employed an expo-facto research design because the data set is historical in nature. This choice of this research design follows Okwori and Sule (2016) that argued in favor of an expo-facto research design to be suitable for a historical date.

3.2 Types and Sources of Data

Annual secondary data which has been sourced from CBN and the National Bureau of Statistics (NBS) for the period, 1981 to 2018 are used in this study. The choice of data is influenced by the literature and availability of data. The choice of the cut-off date is informed by the availability of data that corresponds with the variables of interest. Variables including non-oil revenue, oil revenue, public debt, and GDP for the same period are considered in this study. The choice of these macroeconomic variables is in line with the literature (see Okwori and Sule, 2016).

3.3 Model Estimation Techniques

The study employed an OLS to estimate the parameters of the regression models and how these parameters impact economic growth. The study found these techniques advantageous, based on the time-series nature of our data, as suggested in the literature (see Koutsoyiannis, 1977). Furthermore, Best, Linear, Unbiased, Estimator (BLUE) that characterizes the techniques supports the choice of this technique.

3.4 Model Specification

To address the question of how well these variables, predict economic growth, the study used the e-views statistical application to regress the criterion variable, GDP against the four predicting variables (DD, ED, NOIL, and OIL). It employed a least-squares algorithm [4]. The implicit form of the model is expressed as:

$$Z_t = f(DD, ED, NOIL, OIL) \tag{1}$$

The explicit form of the model shall be

$$Z_t = \alpha_0 + \alpha_1 DD_t + \alpha_2 ED_t + \alpha_3 NOIL_t + \alpha_4 OIL_t + v_t \tag{2}$$

Given that $Z_t = GDP_t$ (3)

where GDP is a dependent variable. The independent variables are External Debt (ED), Domestic Debt (DD), Non-Oil (NOIL) Revenue, and Oil Revenue (OIL). While α_0 is the regression constant (intercept); $\alpha_1, \alpha_2, \alpha_3,$ and α_4 represented the regression coefficients of the explanatory variables and v_t denoted error term.

Equation 1 is used to predict and estimate GDP on the criterion variable for any occurrence from the population whose scores on DD, ED, NOIL and OIL are given. Thus, the estimated regression can be expressed as:

$$\check{Z} = \alpha_0 + \alpha_1 DD_t + \alpha_2 ED_t + \alpha_3 NOIL_t + \alpha_4 OIL_t + v_t \tag{4}$$

The regression coefficients $\alpha_1, \alpha_2, \alpha_3,$ and α_4 are the coefficient or multipliers of the DD, ED, NOIL, and OIL respectively, used to compute the predicted GDP. α_0 is the intercept or constant in the equation. It also represented the predicted value of Z when the predictor variables are theorized to be causally prior to Z. Coefficients $\alpha_1, \alpha_2, \alpha_3,$ and α_4 are interpreted in terms of the causal impact of the predictor on the criterion or the predicted change in Z for a unit change in $\alpha_1, \alpha_2, \alpha_3,$ and α_4 . In the case of these multiple predictors, $\alpha_1, \alpha_2, \alpha_3,$ and α_4 are partial regression coefficients in the model. They indicate the causal effect of one predictor on Z, with the other predictors (that is, statistically controlled).

Stationarity Tests

Stationarity tests are conducted using the Augmented Dickey-Fuller (ADF) version. The ADF test augmented the Dickey-Fuller (DF) test version. It assumed that the error term is not serially or auto-correlated with the explanatory variables. Therefore, given a simple AR (1) model, thus:

$$\Phi_t = \xi\Phi_{t-1} + \mu_t \tag{5}$$

where Φ_t is a variable of interest, ξ is a coefficient, μ_t is disturbance or error term. If $\xi=1$, there is a unit root in a variable. Therefore, the model would not be stationary.

The regression model testing for a unit root with intercept and time trend can be expressed as:

$$\Delta\Phi_t = \delta + \theta_t + \zeta\Phi_{t-1} + \mu_t \tag{6}$$

where Δ denotes the first lag operator, δ denotes constant, θ denotes the coefficient of a time trend. The model is estimated and testing for a unit root is done by testing $\zeta=0$.

The procedure to test for ADF remains the same as that of DF. It is only that the ADF includes a lag of the explained variable of the model.

$$\Delta\Phi_t = \delta + \theta_t + \zeta\Phi_{t-1} + \zeta_1\Delta\Phi_{t-1} + \zeta_p\Delta\Phi_{t-p} + \mu_t \tag{7}$$

where Δ denotes the first lag operator; δ denotes a constant, and θ denotes the coefficient of time trend and p denotes the lag order of the autoregressive procedure. The unit root test is carried out under the null hypothesis, stating that $\zeta=0$ as against the alternative hypothesis that $\zeta<0$:

The Phillips Perron (PP) test is built on the DF test of the null hypothesis, $\zeta=0$ in

$$\Delta\Phi_t = \zeta\Phi_{t-1} + \mu_t \tag{8}$$

where Δ denotes the first lag operator.

Like the ADF test, the issue of autocorrelation that is associated with the DF test is addressed (Phillips and Perron, 1988). Whilst the ADF test addressed this issue by introducing lags of $\Delta\Phi_t$, the Phillips-Perron (PP) test makes a non-parametric correction to the t-test statistics. A key advantage of the Philip-Perron (PP) test over the ADF is that PP is more robust to deal with heteroskedasticity and serial correlation in the error term.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

3.5 Variables and Descriptions

This section describes those variables employed in the study. The variables are domestic debts, external debts, oil revenue, economic growth, and non-oil revenue (see Table 1).

Domestic Debt: a portion of the country’s debt obtained within the country from sources like corporations, or financial institutions (Alade, 2017).

External Debt: country’s debt is obtained from foreign sources like financial institutions or government and foreign corporations (Onyele and Nwokoacha, 2016; Alade, 2017).

Economic Growth: an increase in the number of goods and services that are manufactured in the country at a time (Onyele and Nwokoacha, 2016; Rotimi and Ngalawa, 2017).

Oil Revenue: they are collections from gas and crude oil exports. It also includes proceeds from domestic crude oil sales, royalties, and receipts from petroleum profits tax (Onyele and Nwokoacha, 2016 and Alade, 2017).

Non-oil Revenue: they are proceeds that are not realized from oil (Onyele and Nwokoacha, 2016 and Alade, 2017). It consists of companies' income tax, Valued Added Tax, Custom and Excise Duties, Personal Income Tax, Education Tax, public debt, Levies, aids and grants.

Table 1 Summary of Variables

Variables	Abbreviation	Description/Measurements
Domestic Debt	DD	Annual and logged
Oil revenue	OIL	Annual and logged
Gross Domestic Products	GDP	Annual and logged
Non-oil revenue	NOIL	Annual and logged

Source: Authors’ computation from data obtained from CBN and NBS (2020)

Table 2 Descriptive Statistic of variables

	DD	ED	GDP	NOIL	OIL
Mean	2.765287	2.728213	4.459743	5.167173	5.673564
Median	2.926830	2.801500	4.362869	5.285919	5.975099
Maximum	4.106341	4.890752	4.843918	6.602711	6.948363
Minimum	1.048830	0.367356	4.139226	3.474813	3.860518
Std. Dev.	0.927101	0.910671	0.243724	1.081065	1.074060
Skewness	-0.291256	-0.609465	0.344411	-0.212106	-0.488646
Kurtosis	1.909326	3.605293	1.630051	1.573562	1.776448
Jarque-Bera	2.420743	2.932599	3.722790	3.506576	3.882617
Sum	105.0809	103.6721	169.4702	196.3526	215.5954
Sum Sq. Dev.	31.80207	30.68492	2.197843	43.24194	42.68342
Observations	38	38	38	38	38

Source: Authors’ computation from the data obtained from CBN (2020)

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Table 2 presented the descriptive statistic of variables in Lhutfi, Ritchi, and Yudianto (2020). The mean and median constitute the first two descriptive statistics of measures of central tendency for the variables employed in this study. The OIL has the maximum standard deviation as against DD which has the least standard deviation.

The Jarque-Bera test suggested that the sample is normally distributed. This is because the p-value of the Jarque-Bera test is significant. Therefore, the alternative hypothesis is accepted while the null hypothesis is rejected. The Jarque Bera test result in Table 2 revealed that the null hypothesis is accepted for the distribution. As a result, the variables are described to be distributed normally in the following sequence (from the minimum to the maximum): DD (2.42), ED (2.93), NOIL (3.51), GDP (3.72) and OIL (3.88). If the probability value of the Jarque-Bera test is significant, then the null hypothesis is rejected, and the alternative is accepted.

3.6 A Priori Expectation

Based on empirical studies and theories, it is expected that the explanatory variables have a direct relationship with the explained variable. Therefore, it could be mathematically expressed as $\alpha_1 > 0$, $\alpha_2 > 0$, $\alpha_3 > 0$ and $\alpha_4 > 0$. Increased revenue from OIL, NOIL, and public debts (decomposed into DD and ED) serving as government sources of funding is expected to increase GDP.

4. Data analysis and discussions

4.1 Data Analysis

In this section, tests and findings from various empirical studies were presented and discussed. These tests included the unit root test, logistic multiple regression, diagnostic tests (Cusum Stability and Recursive Estimates), and Wald test. The results provide an economic interpretation of the econometrics results. The results obtained from the OLS regression procedures assisted to answer the research questions in this study. In addition to answering these questions, the technique serves as a basis for thinkable policy recommendations. Consequently, the chapter is organized into two main parts- descriptive and econometric analyses.

4.1.1 Descriptive Analyses

The descriptive analysis presented a trend of the relationship among variables used in the study. Specifically, it depicted the pattern of links between economic growth and government revenue. The econometric analysis helped to establish whether government revenue influenced economic growth. However, the econometric analysis investigated how government revenue impacted economic growth.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

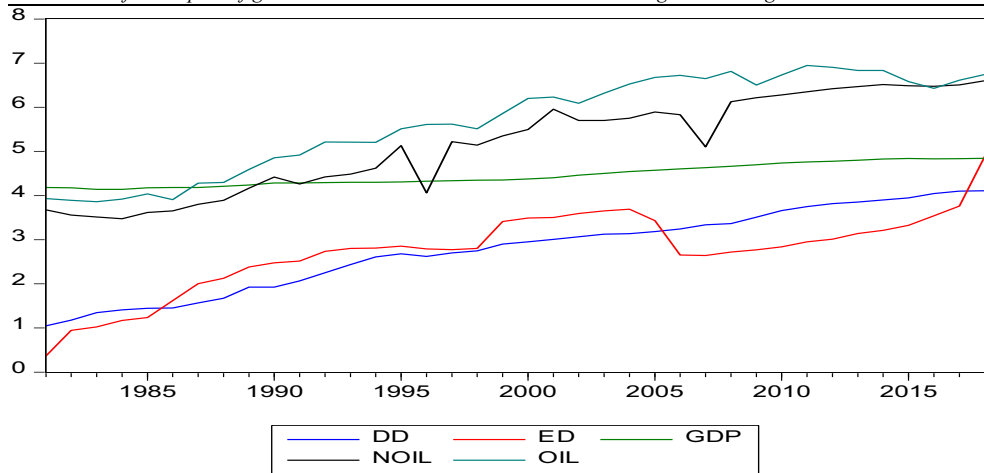


Figure 1 Data Trend

Source: Authors' computation, from the data obtained from CBN (2020)

Figure 1 shows the trend of the domestic debts (DD), external debts (ED), GDP, non-oil revenues (NOIL) and oil revenues (OIL) for the period under study. From the figure, while the other variables steadily grew over time, the GDP sluggishly grew over the period covered. In 1981 for example, the GDP, OIL, NOIL, DD, and ED were 4.18, 3.93, 3.67, 1.05 and 0.37 respectively. While OIL, NOIL, DD and ED remarkably grew by 23.5 percent, 20.2 percent, 83.5 percent, and 573.8 percent respectively in 1990, the GDP sluggishly grew by just 2.4 percent. These variables continuously and positively trended for the period. By the end of 2018, While OIL, NOIL, DD, and ED jumped to 71.5 percent, 79.7 percent, 291.5 percent and 1231 percent, the GDP recorded an upward trend and growth of 15.8 percent for the entire period studied.

4.1.2 Econometric Analyses

Test for Unit Root

The ADF and PP test results for unit roots are presented in Tables 3, 4, 5 and 6. It shows that DD, ED, GDP, NOIL and OIL are integrated series of order I(1).

Table 3 Augmented-Dickey Fuller (ADF) test- Intercept Only

Variables	Level t-Statistic	Prob*	Order of Integration	1 st Difference t-Statistic	Prob*	Order of Integration
DD	-1.978750	0.2945	I(0)	-4.752034	0.0005	I(1)
ED	-1.318823	0.6106	I(0)	-3.152152	0.0315	I(1)
GDP	-0.027819	0.9497	I(0)	-3.395053	0.0177	I(1)
NOIL	-0.791197	0.8096	I(0)	-10.75323	0.0000	I(1)
OIL	-0.791197	0.8096	I(0)	-6.068962	0.0000	I(1)

Source: Authors' computation from data obtained from CBN (2020). Prob* of Variable stationery at 5 percent

Table 4 Augmented-Dickey Fuller (ADF) test- Trend and Intercept

Variables	Level t-Statistic	Prob*	Order of Integration	1 st Difference t-Statistic	Prob*	Order of Integration
DD	-1.609641	0.7693	I(0)	-5.003271	0.0014	I(1)
ED	-1.358360	0.8562	I(0)	-4.788832	0.02003	I(1)
GDP	-1.503995	0.8091	I(0)	-3.319501	0.0793	I(1)
NOIL	-5.002864	0.0613	I(0)	-10.60832	0.0000	I(1)
OIL	-5.234950	0.0908	I(0)	-5.234950	0.0008	I(1)

Source: Authors' computation from data obtained from CBN (2020). Prob* of Variable stationery at 5 percent

Tables 3 to 6 show that all the variables used are not stationary at I(0) but I(1). This is determined by comparing the observed values of the ADF and PP tests (in absolute terms) with the critical value at 1 percent, 5 percent and 10 percent significant levels.

Table 5 Phillip Perron (PP) test- Intercept Only

Variable	Level Adj t-Statistic	Prob*	Order of Integration	1 st Difference t-Statistic	Prob*	Order of Integration
DD	-2.110555	0.2418	I(0)	-4.669127	0.0006	I(1)
ED	-1.421068	0.5615	I(0)	-3.212695	0.0274	I(1)
GDP	0.684590	0.9902	I(0)	-3.242632	0.0255	I(1)
NOIL	-0.662425	0.8438	I(0)	-13.17403	0.0000	I(1)
OIL	-1.435659	0.5544	I(0)	-6.068962	0.0000	I(1)

Source: Authors' computation from data obtained from CBN (2020). Prob* of Variable stationery at 5 percent

Table 6 Phillip Perron (PP) test- Trend and Intercept

Variables	Level Adj t-Statistic	Prob*	Order of Integration	1 st Difference t-Statistic	Prob*	Order of Integration
DD	-1.504924	0.8098	I(0)	-4.994129	0.0014	I(1)
ED	-2.086529	0.5360	I(0)	-4.823161	0.0187	I(1)
GDP	-2.570891	0.2949	I(0)	-5.205971	0.0090	I(1)
NOIL	-4.110088	0.1010	I(0)	-13.18389	0.0000	I(1)
OIL	-0.869907	0.9489	I(0)	-6.785313	0.0000	I(1)

Source: Authors' computation from data obtained from CBN (2020). Prob* of Variable stationery at 5 percent

OLS Estimation

Four predicting variables of economic growth are considered. The predictors are DD, ED, NOIL, and OIL. Consequently, the study obtained the regression equation below (see details in appendix 1):

$$\hat{Z} = 3.81 + 0.31DD_t - 0.1ED_t + 0.07NOIL_t + 0.05OIL_t \tag{9}$$

Model (9) revealed that a one-point rise in the perceived domestic revenue (DD) is expected to cause a 31 percent increase in economic growth when the external debt (ED), non-oil revenue (NOIL) and oil revenue (OIL) are constantly held. This aligned with the a priori that an increase in domestic debt enhances economic growth since the principal component is mobilized within the economy and the interest element is returned to the same economy for further circulation and towards enhancing transactions within the economy. Earlier studies like Fasano and Wang (2002) and Sanni (2007) also documented a similar findings.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Similarly, the model revealed that a 1-point rise in the perceived non-oil revenue (NOIL) produced a 6.5 percent increase in economic growth when the perceived domestic debt (DD), external debt (ED) and oil revenue (OIL) are held constant. This outcome aligned with the a priori that an increase in non-oil revenue positively impacted economic growth. The findings also aligned with Dickson and Presley (2013) and Alade (2017) who argued that an increase in NOIL led to a rise in economic growth. By comparison, when DD, NOIL, and OIL are held constant, a one-point rise in external debt (ED) yields a projected 10 percent decrease in economic growth. This suggests that external borrowing could be harmful to economic growth especially if it is not prudently managed.

It has been noted that the previous administration used borrowing to finance frivolous contracts, politics, and other white elephant contracts. Conversely, the negative impact of the ED on economic growth may not be unconnected with some conditionalities associated with it, which in most cases such conditionalities are outside the control of the borrowing nation, and could impede economic growth. For instance, conditionalities like the openness of the economy (liberalization) and currency devaluation were conditions for obtaining an external loan by General Ibrahim Babangida's led administration. Unfortunately, these conditionalities worked against the Nigerian economy. The OIL revenue also showed a negative impact on economic growth. When DD, ED and NOIL are held constant, a one-point rise in oil revenue (OIL) yielded a projected 5 percent decrease in economic growth. Contrary to our expectations, this outcome suggests that oil revenue may not impact economic growth positively. This finding is similar to Ibeh (2013) who reviewed that oil revenue negatively impacts the Nigerian economic growth. This is not surprising, as it may not be unconnected with the paradox of the resource curse and Dutch Disease [5] documented in Corden & Neary (1982) and Hamilton (2013).

Squared Multiple Correlations (R^2)

The multiple correlation coefficients mean the correlation between the predicted \hat{Z}_t (economic growth) and the predictors. It is calculated for the participants in the study by using Equation (9) and the Z regressand. In this study, the R^2 and adjusted R^2 are respectively 94.8 and 94.2. This indicates that DD, ED, NOIL and OIL jointly accounted for about 94 percent of the variance in economic growth. Buttressing this, the F-statistic and its probability revealed a reliable evaluation of 151.8 and less than 1 percent significance level to support our claim. Furthermore, the Durbin Watson results fall within an acceptable range that the model is suitable to determine the effect of government revenue mobilization on economic growth.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Coefficient Diagnostic Tests

Wald Test

The section examined the existence of a short-run association moving from the set of the explanatory variables to GDP using the Wald test technique with a null hypothesis of no short-run cointegration amid the variables. The benchmark hypotheses of the Wald test are specified below:

H₀: Shortrun cointegration does not exist among the regressors and regressand

H₁: Shortrun cointegration exists among the regressors and regressand

Decision rule:

Accept H₀ when P-Value is higher than 5 percent or reject H₁ when P-Value is smaller than 5 percent

As displayed in Table 7, the Wald test indicates that the endogenous variables are jointly significant in the model.

Table 7 Wald Test Results

Test Statistic	Value	DF	Probability
F-statistic	57.50540	(7, 799)	0.0000
Chi-square	311.2476		0.0000
Null Hypothesis (H ₀): C(1)=C(2)=C(3)=C(4)=0			
Null Hypothesis Summary:			
Normalized Restriction (=0)		Value	Std. Error
DD		0.039788	0.039797
ED		0.011201	0.001522
NOIL		-0.010227	0.021871
OIL		-0.444541	0.016286

Source: Authors' computation from data obtained from CBN (2020)

The outcome showed a short-run relationship, moving from the explanatory variables to the explained variable at the p-value of 1 percent. This suggested that the null hypothesis should be rejected, and the alternative hypothesis accepted.

Residual Diagnostics

Serial Correlation LM test

In this section, the study examined whether there is a serial correlation among the variables. The test is conducted to enable us to rely on the outcome of the model of GDP used in this study.

The benchmark hypotheses of the Wald test are specified below:

H₀: Serial correlation does not exist among the regressors and outcome variable

H₁: Serial correlation does exist among the regressors and outcome variable

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Decision rule:

Accept H_0 when P-Value is higher than 5 percent or reject H_1 when the p-value is smaller than 5 percent

As presented in Table 8, the Wald test shows that the endogenous variables are jointly significant in each equation.

Table 8 Breusch-Godfrey Serial Correlation LM Test

F-statistic	13.87729	Prob. F(2,31)	0.0000
Obs*R-squared	17.95050	Prob. Chi-Square(2)	0.0001

Source: Author's computation from data obtained from CBN (2020)

The serial correlation is presented in Table 8 showing that H_0 could be accepted and therefore rejects the alternative hypothesis. This infers that there is no serial correlation affecting GDP and the various sources of revenue in Nigeria.

Heteroskedasticity Test

In this section, the study examined whether there is a correlation and uniformity in the residual of the model and the corresponding explanatory variables.

The benchmark hypotheses of the Heteroskedasticity test are specified below:

H_0 : Correlation does not exist among the regressors and residual

H_1 : Correlation exists among the regressors and residual

Decision rule:

Accept H_0 when P-Value is higher than 5 percent or reject H_1 when P-Value is smaller than 5 percent

Table 9 Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	3.599824	Prob. F(4,33)	0.0153
Obs*R-squared	11.54391	Prob. Chi-Square (4)	0.0211
Scaled explained SS	9.038022	Prob. Chi-Square (4)	0.0402

Source: Authors' computation from data obtained from CBN (2020)

As presented in Table 9, the heteroscedasticity test revealed that all endogenous variables are jointly significant in the model. This suggested that the endogenous variables do not correlate with the residual.

Stability Diagnostics

Cusum test

In furtherance of the diagnostic tests, the study carried out a stability test to examine the stability of the model in equation (9). The result has been presented in Figure 2, showing that the model is stable and significant.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

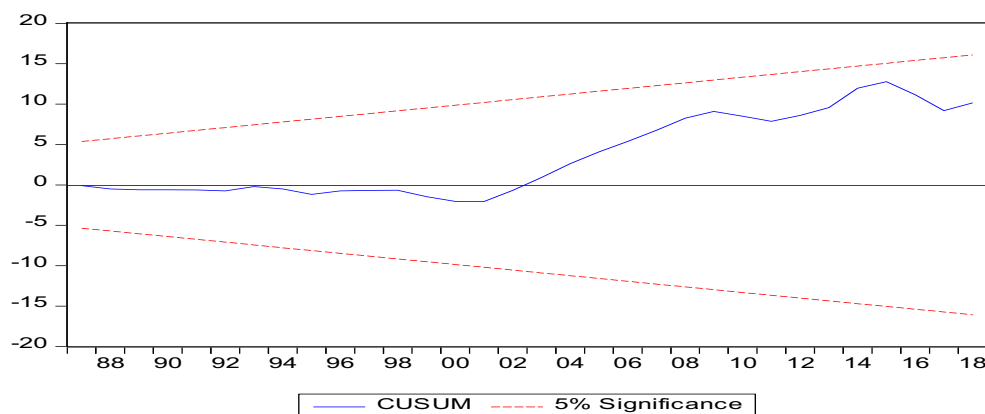


Figure 2 Cusum stability test

Source: Authors' computation from data obtained from CBN (2020)

Recursive Coefficients

In a similar direction, the study carried out a recursive test, as depicted in Figure 3, to observe the significance of the various coefficient of the explanatory variables within the model and their stability. All the coefficients are statistically significant and stable.

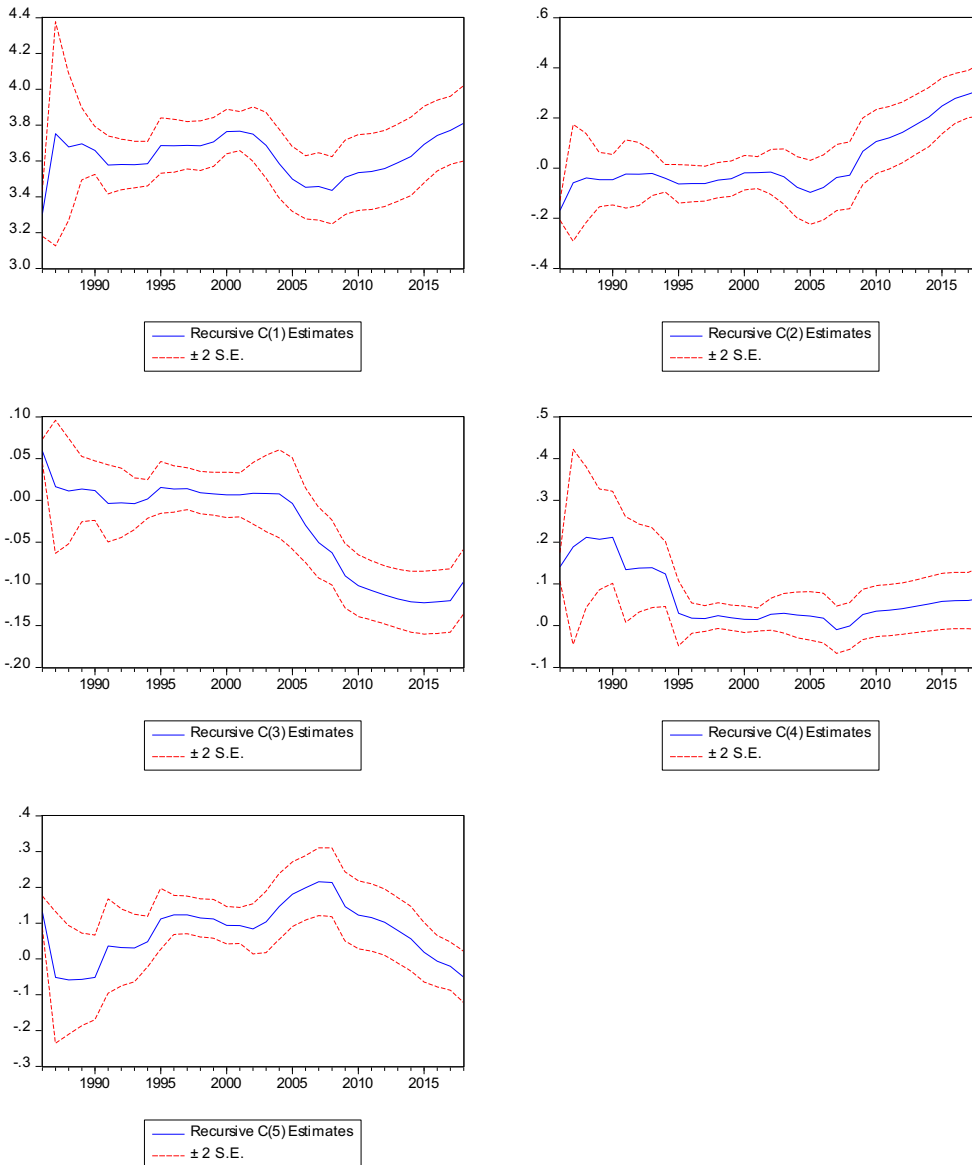


Figure 3 Recursive Coefficients test

Source: Author's computation from data obtained from CBN (2020)

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

4.2 Discussions

This study employed a time-series technique to investigate the economic growth relationship with revenue mobilization in Nigeria from 1981 to 2018. The study employed a multiple regression procedure to estimate how various sources of government revenue in Nigeria impact economic growth. Specifically, the study estimated how economic growth responds to the selected variables. The variables employed in this study are GDP (dependent) and the rest which formed the independent variables are external debt, domestic debts, non-oil revenue, and oil revenue. In addition, all the variables used in this study were logged as indicated in Table 1. The findings from the ADF and PP indicated that variables are stationary at I(1). Consequently, the OLS estimation was carried out and findings from the OLS showed that the domestic debts and NOIL revenue positively and significantly impacted economic growth. Conversely, external debts and oil revenues have a significantly negative impact on economic growth. These results are contrary to the a priori of this model but the probable reasons were given and clearly explained in the context of Nigeria. This may be not unconnected with corruption and recklessness in the management of public funds on one side and the Dutch Disease syndrome which characterized the net oil-exporting countries especially those among the developing countries. The R² and adjusted R² revealed a high correlation between the regressors and regressands.

To ascertain and buttress the reliability of the model, various diagnostic tests were carried out. The tests included coefficient diagnostics (Wald test), residual diagnostics (serial correlation LM and heteroscedasticity tests) and stability diagnostic tests (cusum and recursive coefficient tests). Findings from these tests revealed sizeable support for the OLS model following the value of the t-statistic, F-statistic, and significance level. This finding supports the authors' view that the OLS model appropriately established the relationship between economic growth and selected revenue variables (Ibeh, 2013).

5. Conclusions, implications, suggestions and limitations

The study attended to the research questions using descriptive analysis techniques. Consequently, data analysis was carried out by conducting unit root tests that examined whether the variables were stationary and to what degree. ADF and PP procedures were employed. The results revealed that variables are stationary at I(0). Next to this was the OLS estimation having found that the variables did not cointegrate. The OLS result revealed that domestic debts and NOIL revenue positively and significantly impacted economic growth. Conversely, external debts and oil revenues have a statistically significant and negative effect on economic growth. These results differed from the a priori of this model but the probable reasons were given and clearly explained in the context of Nigeria.

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

Diagnostic tests carried out revealed strong reliability in the model. This is evident from the outcomes of the Wald, serial correlation LM and heteroscedasticity tests. Furthering this, the cusum test showed that the model is stable.

This study investigated the response of economic growth to the various sources of government revenues in Nigeria. It found that both domestic debt and non-oil revenue have a positive and statistically significant effect on economic growth. In contrast, oil revenue and external debt revealed a negative and statistically significant impact on economic growth. Nonetheless, if the policy discussed and recommended in this study is carried out, it will enhance the economic growth and well-being of the populace.

In view of the impending global movement in oil revenue that may impact the economy and the actions that the monetary authorities take to control the movement in the economy is important, findings from this study have revealed that the effects of government revenues are necessary for offering policy direction that will enhance economic growth. Consequently, the results from this empirical study have several implications for economic growth policy. Firstly, contrary to the general view that oil revenue would always have a positive impact on economic growth, this study revealed otherwise and argued that this occurrence may be associated with the resource curse and the Dutch disease paradox. Therefore, policymakers, through planned programs, should diversify the Nigerian economy instead of allowing it to stay a mono-economy. Secondly, the government should introduce a policy that will review existing revenue mobilization machinery— especially the multifarious non-oil revenue base- to ensure enhanced revenue remittance to the government purses. Furthermore, there is an urgent need to articulate policies that will promise better utilization of investments (both domestic and foreign) to increase productivity and enhance revenue mobilization. Thirdly, borrowing should be treated as the last resort by the government to improve the economy. Where it is unavoidable, such credit facilities should be limited to domestic debt (DD). However, if it requires that external debts be considered, such credit facilities should be used to enhance the real sector and productive ventures to accelerate economic activities in the country. In addition, it should be negotiated in favor of the domestic economy.

A few limitations confront this study. The main limitation of the study is related to data paucity. Initially, the study planned to use monthly data. Unfortunately, data on GDP are reported on a quarterly basis and those of external debt, domestic debt, non-oil revenue and oil revenue is found on an annual basis. This constrained the study from using high-frequency data but annual as available from 1981-2018. In other words, error in the estimation of the frequency characteristics of the secondary data was another limitation of the study. Therefore, this study suggests that the mixed data samples (MIDAS) estimating technique which can combine both high-frequency and low-frequency data should be adopted for a study like this. This may

Rotimi, C.O., John, N., Rotimi, M. E., Doorasamy, M. (2022)

Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

offer a more robust result that will enhance policy formation. One interesting variant of this study is an in-depth review of the past techniques to investigate economic growth and revenue nexus in Nigeria. Variation in economic growth is not by domestic debt, external debt, oil revenue and non-oil revenue alone. Therefore, it is required that other macroeconomic variables and monetary-related variables may be considered to investigate the monetary policy's impact on economic growth.

Acknowledgments

The authors are grateful to the Central Bank of Nigeria (CBN) and the National Bureau of Statistics (NBS) for making available the necessary data used in this study. The authors are also thankful to the various reviewers and editors for their invaluable contribution to seeing the success of this paper.

Funding

This research received no specific grant from any funding agency in the public, commercial, or non-governmental organization. Nonetheless, the authors are grateful to their host institutions, the Federal University Lokoja, Nigeria and the University of KwaZulu Natal, Durban, South Africa.

Author Contributions

Comfort Omolayo Rotimi conceived the study and was responsible for the design and development of the data analysis. All the authors were responsible for the literature review section. Comfort Omolayo Rotimi, Mathew Ekundayo Rotimi and Mishelle Doorasmy analyzed the data and interpreted the results. Comfort Omolayo Rotimi and Mathew Ekundayo Rotimi carried out the typesetting and Nathptali John supervised the study.

Disclosure Statement

The authors have not any competing financial, professional, or personal interests from other parties.

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Assessment of the impact of government revenue mobilisation on economic growth in Nigeria

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Notes

1. Revenue refers to the funds generated by the government, from different sources of investments in all the sectors of the economy, to provide goods and services for the benefit of the public.
2. Borrowing takes the form of issuing one-period bonds.
3. Direct taxes include corporate tax, personal income tax, capital gain tax and wealth tax. Indirect taxes include custom duties, excise duty, and value-added tax (VAT) and service tax (Chaudhry and Munir, 2010).
4. The least-squares algorithm minimizes residual or the sum of the squared errors of prediction. The minimization cuts across the sample.
5. Dutch Disease connotes the negative impact of oil on an economy, causing a sharp rise in the inflow of foreign currency (see Egert & Leonard, 2007). Hence, the currency inflows result in currency appreciation but make the country's other products less price competitive on the export market.

Appendix 1. Multiple Regression Result

Dependent Variable: GDP
 Method: Least Squares
 Date: 21/11/20 Time: 07:54
 Sample: 1981 2018
 Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.811211	0.105526	36.11629	0.0000
DD	0.312651	0.052359	5.971248	0.0000
ED	-0.097293	0.019461	-4.999425	0.0000
NOIL	0.065547	0.037757	1.736049	0.0519
OIL	-0.050990	0.035813	-1.423786	0.0163
R-squared	0.948460	Mean dependent var		4.459743
Adjusted R-squared	0.942213	S.D. dependent var		0.243724
S.E. of regression	0.058589	Akaike info criterion		-2.714470
Sum squared resid	0.113277	Schwarz criterion		-2.498998
Log-likelihood	56.57494	Hannan-Quinn criter.		-2.637807
F-statistic	151.8196	Durbin-Watson stat		2.618827
Prob(F-statistic)	0.000000			

Source: Own processing