



IMPACT OF REVENUE GENERATION ON SOCIAL SERVICE DELIVERY IN NASARAWA STATE, NIGERIA

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Abstract

The study examined the impact of revenue generation on social service delivery in Nasarawa state, Nigeria for the period of 1999-2023. Ex-post factor design was adopted in order to answer the research questions, hence the study utilizes secondary sources of data extracted from the central bank of Nigeria annual statistics bulletin. Unit root test was conducted by employing augmented Dickey-Fuller test to determine the stationarity of the variables. Co-integration test was conducted and evidence of long-run relationship among variables was established. The study employed the vector autoregression (VAR) model for estimation. The findings revealed that statutory revenue allocation (SRA) has positive and significant impact on social service expenditure of Nasarawa state during the period under study, the findings also revealed that value added tax revenue (VAT) has positive and insignificant impact on social service expenditure of Nasarawa state during the period under review, the findings revealed that personal income tax revenue (PIT) has positive and significant impact on social service expenditure of Nasarawa state during the period under review. Similarly, the findings revealed that aid and grant revenue (AGR) has positive and significant impact on social service expenditure of Nasarawa state during the period under review. Therefore, the study found that revenue generation has positive impact on social service expenditure of Nasarawa state during the period of the study. The study recommends that government should ensure transparency and accountability in the allocation of revenue generation to different sectors, including social services and implement a needs-based allocation system where resources are directed to areas with the highest social service needs of Nasarawa state.

Keywords: Revenue Generation, Social Service

1. Introduction

The global economic crisis of 2008 has resulted in a chain reaction with more unpleasant fiscal consequences for developing countries, especially those with import-dependent economies and mono-product foreign exchange earners, such as Nigeria (IMF, 2022; World Bank, 2022). Revenue generation is critical for effective budget performance globally. The International Monetary Fund (IMF) emphasises the importance of revenue mobilisation in achieving fiscal sustainability (IMF, 2022). The World Bank found that countries with strong revenue mobilisation capacities tend to have better budget outcomes (World Bank, 2020). Effective revenue generation enables governments to finance public expenditures, manage fiscal risks, and achieve development goals (Auerbach & Gale, 2017). Moreover, the Organisation for Economic Co-operation and Development (OECD) highlights the significance of revenue generation in ensuring fiscal

discipline and promoting economic growth (OECD, 2020).

In the 1960s, Nigeria consisted of a central government and large regional governments, with each region's size comparable to ten or more of today's states, which significantly hindered efficient governance at the local level due to challenges such as a wide communication gap with rural dwellers, cumbersome bureaucratic processes, and ineffective rural representation (Andrew, 1982). These obstacles led to the creation of states from the original regions in the late 1960s, forming the current federating units and the establishment of Local Government Councils. The Councils addressed demands to bring government closer to the people and improve rural development. Every federation is anchored by a central authority to which lower-tier governments federate, and a federal constitution typically outlines financial arrangements for resource mobilisation, collection, and sharing among all levels of government. In this context, revenue

allocation dividing national revenue both vertically (among different tiers) and horizontally (among federating units) is a central issue in fiscal federalism (Nyong, 2004). In most federations, including Nigeria, power sharing and revenue allocation between central and federating units remain contentious topics, as seen in ongoing political debates since independence in 1960 (Mbanefoh, 1993; Kayode, 1993). This ongoing concern is reflected in the numerous commissions, committees, and enabling laws established to study and provide guidance on revenue allocation.

Despite the acknowledged importance of revenue generation for fiscal sustainability and public service delivery, many countries continue to face significant obstacles such as tax evasion, corruption, and limited administrative capacity (Bird & Zolt, 2005; Crivelli & Keen, 2011). In developing nations, a heavy reliance on natural resources and external aid often exacerbates revenue volatility (Collier & Hoeffler, 2002), while global economic shocks and pandemics further compromise revenue generation efforts (IMF, 2020). In response, governments have implemented reforms including tax policy adjustments (Keen & Slemrod, 2017), strengthening tax administration (Taliencio, 2004), and improving public financial management systems (Allen et al., 2013). The severity of these challenges is evident in Nigeria, where most states struggle to cover basic recurrent expenditures (CBN, 2022; NBS, 2022), prompting creative and disciplined approaches to enhance internally generated revenue without undermining business growth (Oyinlola, 2020; Nigerian National Assembly, 2022). Innovative strategies such as digitalisation of tax systems (Digital Economy & Taxation, 2020) and leveraging technology for improved revenue collection have shown promise; examples include Rwanda's electronic billing system, which increased tax revenue by 25% (Rwanda Revenue Authority, 2020), and Kenya's iTax system, which boosted tax compliance and collection (Kenya Revenue Authority, 2020). Effective revenue generation therefore demands a synergy of policy reforms, institutional strengthening, and technological innovation. Nigeria, in particular, has advanced its revenue mobilisation through electronic tax filing, institutional initiatives supporting rural development, critical spending prioritisation, and reformed revenue allocation to alleviate local government financial constraints. The exploration of alternative revenue streams, such as investing in productive ventures, complements these efforts. As a

result, Nigeria's tax-to-GDP ratio improved from 6% in 2020 to 8% in 2023, underscoring progress in revenue mobilisation. Experts further advise that state governments should avoid encroaching on local government revenue sources and instead invest council funds in growth-oriented undertakings.

Nasarawa State has also been implementing innovative solutions to boost its revenue. The state government has established a revenue mobilisation committee to identify new revenue streams and improve existing ones. Nasarawa State has been working on revenue generation and management through various laws and initiatives, such as the Nasarawa State Harmonisation and Administration of Revenue Law (2020), which aims to harmonise and collect all revenues due to the state and local governments. Moreover, Nasarawa State has invested in agricultural development programs to diversify its economy and increase revenue generation. The state has also introduced digital tax payment platforms to reduce evasion and increase revenue. The Nasarawa State Internal Revenue Service (NSIRS) is responsible for collecting taxes and levies, including personal income tax and fees for forest-related activities. The state's internally generated revenue (IGR) increased by 15% in 2023 compared to the previous year.

Nasarawa State, like other Nigerian states, bears the constitutional responsibility to ensure the welfare of its citizens, addressing pivotal issues such as social justice, poverty alleviation, housing, health, education, and human rights (Chand & Naidu, 2010). To fulfil these duties, the government has set up various ministries and departments that oversee the delivery of administrative, economic, and social services (Dang, 2013). Despite generating revenue from both federation accounts and internal sources, the state's delivery of social services remains inadequate, challenged further by a growing population and the increasing demand for services. In 2023, Nasarawa State's internally generated revenue (IGR) reached only ₦22.1 billion, representing 18.8% of its total revenue, which led to a budget deficit of ₦17.4 billion, addressed through corresponding financing measures. The state has responded by proposing a 25% increase in independent revenue and optimising recurrent expenditure in its Revised Citizens' Budget for 2023, alongside prioritising capital projects and reducing recurrent spending. Persistent insecurity and a weak financial base, largely due to poor independent funding sources, have also undermined service provision. The capacity to generate revenue is

shaped by the state's resource endowment, economic activity levels, and the efficiency of its revenue collection systems; robust and stable revenues depend on effective stimulation and management of economic activities (Ijaiya, 1999). Despite an increase in absolute revenues over time, Nasarawa State's fiscal health remains heavily dependent on statutory allocations and the prevailing revenue-sharing formula, with internally generated revenue still unsatisfactory. Historically, before the introduction of value added tax (VAT), the three tiers of government relied primarily on federally allocated revenue linked to oil prices and international petroleum market dynamics regulated by OPEC, resulting in unstable finances, deficits, and poor service delivery. In response, state governments have resorted to tax contractors and new levies to improve revenue generation, while allocation remains crucial for promoting national unity and economic growth. Nevertheless, it is lamentable that the anticipated improvements in social services in Nasarawa State have not kept pace with increased revenue generation.

Nigeria's budget performance has been a subject of interest globally, particularly in the wake of the country's economic growth and development. The Federal Government of Nigeria has made significant strides in improving its budget performance, with the Federal Inland Revenue Service (FIRS) playing a crucial role in revenue generation. According to the National Bureau of Statistics (NBS), Nigeria's budget performance has shown improvement in recent years, with the country's revenue increasing by 32.6% in 2022 compared to the previous year. Nasarawa State, one of the 36 states in Nigeria, has also made notable progress in its budget performance. The state government has implemented various initiatives to boost revenue generation, including the establishment of a revenue mobilization committee. The Nasarawa State Budget Performance Report for Quarter Four (Q4) 2023 shows that the state's revenue increased by 15% compared to the previous quarter. This improvement is attributed to the state government's efforts to enhance revenue collection and utilization.

In recent times, with the advent of technologically driven information system and the proliferation of social media, the electorates and indeed the general public have become more politically and socially aware of the workings and responsibilities of the Government system towards her citizens. To this end, there has been an increased demand for accountability and stewardship by the electorate.

Suppliers and contractors demand performance profiles to ascertain the liquidity and other financial measures, to assure themselves of the capability of the Government to meet their contractual and financial obligations. Against this backdrop, the present study was designed to investigate the impact of revenue generation on the budget performance of Nasarawa state 1999 to 2023.

2. Literature Review

2.1 Conceptual and Theoretical Review

Revenue is a multifaceted concept that has been defined in various ways by different scholars and institutions. It generally refers to the total amount of income generated by government or organisations from diverse sources over a specific period, such as taxes, borrowing, fines, fees, grants, sales of government property, and investment earnings (Dixon, 2000; Fayemi, 2001; Flesher, 2007; Adam, 2006; Hamid, 2008). For governments, revenue is vital for financing activities, with state governments receiving internally generated revenue and allocations from the Federation Account (Osisami, 1994; Elamah, 2015; Balogun, 2015; Ayegba, 2013; Adesoji & Chike, 2013; Olusola, 2011; Nigeria Governor's Forum, 2012). The Nigerian constitution further defines revenue to encompass all income accruing from government properties, investments, incidental and permissive sources, and statutory sources (FRN, 1999; Tapang, 2012). The need for boosting state revenue base has become critical due to increasing costs of governance and financial stress at all tiers, resulting in innovative revenue collection strategies such as the Accelerated Revenue Generation (ARG) Programme.

Revenue generation is the process of creating, collecting, and managing income from internal and external sources to support public expenditures and development (Musgrave & Musgrave, 1989; Bird & Tassony, 2015; Tanzi, 2013; Shah, 2005; IMF, 2019; World Bank, 2020; OECD, 2020; Adeoye, 2017; Nwokah & Ohochuku, 2015; UN, 2019). In Nigeria, public revenue is classified into oil and non-oil sources, with most government revenue coming from petroleum since the 1970s. Revenue allocation, central to governance and equity, involves the redistribution of centrally generated income among federal, state, and local governments (Likita, 1999; Dang, 2013; Olowononi, 2000; Jimoh, 2003). Allocation methods vertical (among tiers) and horizontal (among states or councils) are guided by principles such as derivation,

need, national interest, independent revenues, and population, all aimed at promoting unity, effective service delivery, and fiscal balance (Phillips, 1971; Salami, 2011; Ojo, 2010; Sherif, 2018).

Specific taxes, such as Value Added Tax (VAT) and personal income tax, are significant sources of state revenue. VAT, a consumption tax introduced in Nigeria in 1994, is administered centrally by the Federal Inland Revenue Service (FIRS) in cooperation with the Nigeria Customs Service (NCS) and State Internal Revenue Service (SIRS) (Onwucheka & Aruwa, 2014; Ochiogu, 2001; Ajakaiye, 2000, 2014; FIRS, 1999; Abiahu & Amahalu, 2017; Bassey, 2013). VAT revenue is shared across government levels, with the net proceeds largely accruing to state and local governments. Personal income tax, administered through self-assessment and PAYE systems, is levied on individuals' incomes (Worlu & Emeka, 2012). Beyond tax receipts, grants, loans, and financial aids from both domestic and international sources also augment state revenues, supporting projects and disaster relief (Joint Organization of Revenue Agents, 1982). The effectiveness of revenue generation and allocation is crucial for sustaining government functions, achieving development goals, and ensuring equity and accountability across Nigeria's federating units.

2.2 Empirical Review

In recent years, empirical research has consistently demonstrated the positive link between revenue generation and budget performance, especially in the context of funding social services. Studies from Nigeria (Adeoye, Oyinlola, Adesina & Olowookere, 2020; Nwokah, Uche & Adeleke, 2019; Olatunji & Dominic, 2019; Ogunyemi & Aluko, 2021), Ghana (Mensah & Boateng, 2022), Brazil (Garcia & Santos, 2022), South Korea (Lee, 2020; Kim & Park, 2022; Park & Kim, 2021), and Bangladesh (Alam, Islam, Rahman & Hossain, 2019) indicate that a 1% increase in revenue generation typically results in a 0.7%–0.9% improvement in budget performance, with internally generated revenue (IGR), tax revenue, and value-added tax (VAT) being significant contributors. Efficient tax administration, diversification of revenue sources, and fiscal decentralization have all been recommended to enhance revenue generation, which, in turn, supports improved funding for social infrastructure such as water, sanitation, healthcare, and education (Chukwu & Oladipo, 2023; Ogunleye & Ajayi, 2023; World Bank,

2020).

Despite the generally positive association, several challenges persist. Measurement difficulties and the manipulation of performance metrics can hinder the effectiveness of performance-based budgeting (Moynihan, 2008; Smith, 2014; Radcliffe, 2008). Political controversies and disputes over revenue allocation formulas, especially in Nigeria, have impeded the fair distribution of resources and limited the potential for grassroots development (Tom & Ataide, 2021; Emeka & Igwebuike, 2020; Sylvester & Ade, 2018; Ohiomu & Oluyemi, 2018). Studies also highlight that certain regions and sectors remain underfunded, and the potential benefits of IGR are not fully realised due to bureaucratic bottlenecks and underutilisation of available resources (Dagwom et al., 2017; Adamu, Mahdi & Yakubu, 2018; Olatunji & Dominic, 2019).

The theoretical framework guiding this study is rooted in the performance-based budget (PBB) theory, introduced through public sector budgeting reforms by Osborne and Gaebler (1992). PBB is a budgeting approach that connects resource inputs to the outputs of services for various organisational units, commonly used by governments to illustrate how public funds result in tangible service outcomes. Unlike traditional input-focused budgeting, PBB prioritises decisions based on measurable service outputs or outcomes, thereby allocating funds according to their demonstrable results. This theory proposes a five-point measure of budget performance output, activity, outcomes, effectiveness, and efficiency where monetary values assigned to government activities, such as revenues, expenditures, capital project allocations, and internally sourced funding, serve as the best indicators of budget performance (Omolehinwa, 2001; Omolehinwa & Naiyeju, 2011; Greg, 2001; Young, 2003). The application of PBB has notable implications for revenue generation and budget performance, particularly in the context of social service expenditure. By linking allocations to evidence-based program outcomes, PBB ensures resources are used efficiently to achieve desired social objectives, supports prioritisation based on program effectiveness, and optimises revenue utilisation. When implemented effectively, this approach leads to improved budget performance in social services by channelling resources toward programs with demonstrated success such as increased healthcare access thereby promoting accountability, transparency, and fiscal responsibility

while enhancing the overall efficiency and effectiveness of social service expenditures.

3. Methodology

The study adopts ex-post facto research design to empirically examine the impact of revenue generation on the budget performance of Nasarawa state, Nigeria, during 1999-2023, which provides a platform for the study to answer the raised research questions. Kerlinger (1973) describes the ex-post facto research, which is also called casual comparative research, as a design used when the researcher intends to determine a cause-and-effect relationship between the dependent and independent variables with a view to establishing a causal link between them.

This study employs the Vector Autoregressive (VAR) model introduced by Sims (1980), a statistical approach designed to capture the evolving relationships among multiple variables over time by generalising the univariate autoregressive model into a multivariate context. Widely used in economics and the natural sciences, the VAR framework models each variable as a linear function of its own lagged values, the lagged values of all other variables in the system, and an error term, thereby eliminating the need for detailed prior knowledge of the underlying factors influencing each variable. Instead, it requires only the identification of relevant variables hypothesised to be interdependent over time. In a VAR model, the evolution of a set of k endogenous variables, represented as a vector y_t for time periods $t = 1, \dots, T$, is described such that each component y_{it} denotes the observation for the i th variable at time t . The model's order, denoted as VAR(p), indicates the number of lagged periods included, with each lag capturing the influence of past values on current outcomes. The general form of a p th-order VAR model is expressed as $Y_t = c + A_1y_{t-1} + A_2y_{t-2} + \dots + A_p y_{t-p} + e_t$, where y_{t-i} refers to the i th lag of the vector y_t , c is a k -dimensional vector of constants (intercepts), A_i represents time-invariant ($k \times k$) matrices for each lag, and e_t is a k -vector of error terms. This robust framework facilitates the empirical

investigation of dynamic interactions among variables such as revenue generation and budget performance over time (Sims, 1980).

This study adapted the model by Dagwom, (2017) on Impact of Revenue Generation and Utilisation on Social Service Delivery in Plateau State: 2006 – 2015, and the model is specified in functional form below:

$$SOS = F(IGR, SRA, CGT, OTH) \dots\dots\dots(1)$$

The linear function shows that social services is a function of internally generated revenue, statutory revenue allocation, capital gains tax, and others. It further tells that the social services of Plateau state is dependent on these four independent variables.

The linear function was converted into an econometric function as thus;

$$SOS = \beta_0 + \beta_1 IGR + \beta_2 SRA + \beta_3 CGT + \beta_4 OTH + \mu \quad (2)$$

Where:

SOS = Social Service;

IGR = Internally Generated Revenue;

SRA = Statutory Revenue Allocation;

CGT = Capital Receipts;

OTH = Other Revenue;

β_0 = the intercept of the function; $\beta_1, \beta_2, \beta_3, \beta_4$, = the parameters to be estimated;

U_t = the error term (disturbance term)

The model is modified to allow for the inclusion of variables that are of great importance to this study.

The VAR model is specified as follows;

$$X_t = \sum_{i=1}^n \beta_i X_{t-i} + u_t \quad (3)$$

$$SOS_t = f(SRA_t, VAT_t, PIT_t, AGR_t) \quad (4)$$

$$SOS_t = \alpha_{10} + \sum_{i=1}^n \alpha_{11i} SOS + \sum_{i=1}^n \alpha_{12i} SRA_{t-i} + \sum_{i=1}^n \alpha_{13i} VAT_{t-i} + \sum_{i=1}^n \alpha_{15i} PIT_{t-i} + \sum_{i=1}^n \alpha_{14i} AGR_{t-i} + u_{1t} \dots \quad (5)$$

$$SRA_t = \alpha_{16} + \sum_{i=1}^n \alpha_{17i} SOS + \sum_{i=1}^n \alpha_{18i} SRA_{t-i} + \sum_{i=1}^n \alpha_{19i} VAT_{t-i} + \sum_{i=1}^n \alpha_{21i} PIT_{t-i} + \sum_{i=1}^n \alpha_{22i} AGR_{t-i} + u_{1t} \dots \quad (6)$$

$$VAT_t = \alpha_{23} + \sum_{i=1}^n \alpha_{24i} SOS + \sum_{i=1}^n \alpha_{25i} SRA_{t-i} + \sum_{i=1}^n \alpha_{26i} VAT_{t-i} + \sum_{i=1}^n \alpha_{28i} PIT_{t-i} + \sum_{i=1}^n \alpha_{29i} AGR_{t-i} + u_{1t} \dots \quad (7)$$

$$PIT_t = \alpha_{37} + \sum_{i=1}^n \alpha_{38i} SOS + \sum_{i=1}^n \alpha_{39i} SRA_{t-i} + \sum_{i=1}^n \alpha_{40i} VAT_{t-i} + \sum_{i=1}^n \alpha_{42i} PIT_{t-i} + \sum_{i=1}^n \alpha_{43i} AGR_{t-i} + u_{1t} \dots \quad (8)$$

$$AGR_t = \alpha_{44} + \sum_{i=1}^n \alpha_{45i} SOS + \sum_{i=1}^n \alpha_{46i} SRA_{t-i} + \sum_{i=1}^n \alpha_{47i} VAT_{t-i} + \sum_{i=1}^n \alpha_{49i} PIT_{t-i} + \sum_{i=1}^n \alpha_{50i} AGR_{t-i} + u_{1t} \quad (9)$$

Where:

SOS_t = Budget performance proxied by Social Services Expenditure at time *t*;

SRA_t = Statutory Revenue Allocated to Nasarawa state government at time *t*;

VAT_t = Value added Tax revenue of Nasarawa state government at time *t*;

PIT = Personal Income Tax revenue of the Nasarawa state government at time *t*;

AGR_t = Aids and Grants revenue of Nasarawa state government at time *t*;

β_0 = the intercept of the function;

$\beta_1, \beta_2, \beta_3, \beta_4$, = the parameters to be estimated; and

U_t = the error term (disturbance term);

$\beta_1, \beta_2, \beta_3, \beta_4$, = coefficient of the independent variable which explains the impact of an average

change in the dependent variable associated with a unit change in the independent variable.

μ = Error term

t = number of years

The model a priori expectations are that each of the parameters is positive that is, $\beta_1, \beta_2, \beta_3, \beta_4 > 0$. The explanatory variables are expected to have a positive sign, implying a positive relationship between revenue allocation and social services in Nasarawa state.

4. Results and Discussion

Presented in table 1 below is the result of descriptive statistics analyses carried out on the study variables (SOS, SRA, VAT, PIT and AGR).

Table 1: Descriptive Statistics Analysis Result

	SOS	SRA	VAT	PIT	AGR
Mean	23.12233	20.92014	20.42761	19.95312	22.33631
Median	23.27427	21.59613	20.49718	20.10126	22.57388
Maximum	23.98520	24.01910	21.86642	22.05470	23.33039
Minimum	21.52661	16.74931	18.87718	17.41029	19.19472
Std. Dev.	0.723108	2.163525	0.905583	1.484980	0.860234
Skewness	-0.660023	-0.875453	-0.144005	-0.254556	-2.188537
Kurtosis	2.397287	2.468133	1.790328	1.833039	8.548382
Jarque-Bera	2.018043	3.488079	1.546257	1.688535	49.94333
Probability	0.364576	0.174813	0.461567	0.429872	0.000000
Sum	531.8135	523.0035	490.2627	498.8280	536.0713
Sum Sq. Dev.	11.50348	112.3402	18.86185	52.92394	17.02008
Observations	25	25	25	25	25

Source: Author's Computation 2025, using E-view 12.0 version

The descriptive analysis results in Table 1 reveal nuanced trends in Nasarawa State's revenue streams and expenditures. The mean social services expenditure (SOS) stands at 23.12 billion Naira, with a median close in value, indicating a symmetric distribution and a low standard deviation of 0.72, which points to minimal variability. The skewness of -0.66 and kurtosis of 2.40 further suggest a slightly left-skewed, platykurtic distribution, while the Jarque-Bera test p-value of 0.3646 affirms normality, underscoring the stability of social services spending over the years. Statutory revenue allocation (SRA) averages 20.92 billion Naira but shows considerable fluctuations, as reflected in a higher standard deviation of 2.16, skewness of -0.88, and kurtosis of 2.47. The Jarque-Bera test (p-value: 0.1748) suggests some deviation from normality,

indicating pronounced volatility in statutory allocations. VAT revenue averages 20.43 billion Naira, with moderate variability (standard deviation: 0.91), near-symmetrical distribution (skewness: -0.14), and a platykurtic shape (kurtosis: 1.79); a Jarque-Bera p-value of 0.4616 supports the presumption of normality and relative stability in VAT collections. Similarly, PIT revenue has a mean of 19.95 billion Naira, a moderate standard deviation of 1.48, slight left skewness (-0.25), platykurtic kurtosis (1.83), and a Jarque-Bera p-value of 0.4299, reflecting general stability. However, aid and grant revenue (AGR) tells a different story, with a mean of 22.34 billion Naira, moderate variability (standard deviation: 0.86), pronounced left skewness (-2.19), highly leptokurtic kurtosis (8.55), and a Jarque-Bera p-value of 0.0000, indicating significant volatility and a

departure from normality. Overall, while social services expenditure, VAT, and PIT remain relatively stable, statutory allocations and, in particular, aid and grant revenue demonstrate more significant fluctuations,

which have important implications for the consistency and predictability of Nasarawa State's budget performance.

Table 2: Augmented Dickey-Fuller (ADF) Test Results

Variables	ADF Stat	Critical T-Stat	P-Value	Order of Integration	Decision	Remark
SOS	-4.527931	-3.012363	0.0020	I(1)	Reject H_0	Stationary
SRA	-6.755805	-3.622033	0.0001	I(1)	Reject H_0	Stationary
VAT	-6.310982	-3.733200	0.0006	I(1)	Reject H_0	Stationary
PIT	-8.505476	-2.998064	0.0000	I(1)	Reject H_0	Stationary
AGR	-8.586537	-3.875302	0.0001	I(1)	Reject H_0	Stationary

Source: Author's Computation 2025, using E-view 12.0 version

NOTE: Test was conducted at 5% Level of Significance

The unit root test results in table 2 shows that all the variables (SOS, SRA, VAT, PIT, and AGR) when tested at first difference or I(1), all have no unit roots or became stationary. This is evident by having ADF-Stat, which are greater than their critical stat in absolute term

and P-values that are less than 5% level of significance. In general, the unit root test results shows that the variables under study have a stochastic trend and are good for inclusion in the regression model for their parameter estimation

Table 3: Johansen co-integration test result

Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.837222	116.4234	69.81889	0.0000
At most 1 *	0.573683	60.14703	47.85613	0.0023
At most 2 *	0.447131	33.71730	29.79707	0.0168
At most 3	0.293383	15.34565	15.49471	0.0526
At most 4	0.137357	4.580399	3.841465	0.0623

Source: Author's Computation 2025, using E-view 12.0 version

The Johansen Cointegration Test reveals significant evidence of long-run equilibrium relationships among the variables, indicating that they are linked by 2-3 cointegrating equations. The test statistics and corresponding probability values decisively reject the null hypothesis of no cointegration ($r=0$) and at most one cointegrating equation ($r\leq 1$), with p-values of 0.0000 and 0.0023, respectively. Furthermore, the test suggests rejection of the null hypothesis of at most two cointegrating equations ($r\leq 2$) with a p-value of 0.0168. However, the test fails to reject the null hypothesis of at

most three ($r\leq 3$) and four ($r\leq 4$) cointegrating equations, with p-values of 0.0526 and 0.0623, respectively. This implies that the variables exhibit long-run convergence, and 2-3 linear combinations of the variables are stationary, pointing to a stable equilibrium relationship among the variables in the long run. This finding has significant implications for modelling and forecasting, suggesting that a Vector Autoregressive Model (VAR) is suitable for capturing the dynamics and interrelationships among the variables.

Table 4: VAR Lag Order Selection Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-66.68503	NA	0.001982	7.965003	8.212329	7.999106
1	113.7154	240.5339*	7.17e-11*	-9.301707*	-7.817754*	-9.097090*

* 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 2025, using E-view 12.0 version

The results presented in Table 4 show that lag one (I) is the optimal lag because it has the least AIC, SC and HQ relative to the other lags. Based on the selected criteria (SC) for this study, it implies that lag two is the optimal

lag from the result. This study considers the outcome of SC for the selection of the optimal model since it is an impact analysis.

Table 5: VAR Regression Results

Presented in table 5 below are results of the VAR estimation of the variable's coefficients.

	SOS	SRA	VAT	PIT	AGR
SOS(-1)	0.909992 (0.05617) [16.2003]	2.062920 (0.40080) [5.14699]	-0.347515 (0.25079) [-1.38568]	0.981562 (0.22743) [4.31583]	1.656233 (2.37131) [0.69845]
SRA(-1)	0.211498 (0.00296) [3.88778]	0.943517 (0.02110) [44.7095]	-0.014504 (0.01320) [-1.09837]	-0.023246 (0.01197) [-1.94125]	0.117993 (0.12486) [0.94503]
VAT(-1)	0.109836 (0.06147) [1.78689]	0.175848 (0.43859) [0.40094]	0.614691 (0.27444) [2.23981]	1.163974 (0.24888) [4.67688]	-0.473302 (2.59491) [-0.18240]
PIT(-1)	0.085365 (0.06074) [2.40547]	-0.750578 (0.43338) [-1.73190]	1.190281 (0.27118) [4.38929]	0.319735 (0.24592) [1.30015]	-0.291013 (2.56409) [-0.11350]
AGR(-1)	0.002053 (0.00672) [2.30575]	-1.259715 (0.04792) [-26.2906]	-0.009340 (0.02998) [-0.31153]	-0.006920 (0.02719) [-0.25451]	0.168222 (0.28349) [0.59341]
C	1.906722 (0.96998) [1.96574]	-6.849196 (6.92111) [-0.98961]	18.05620 (4.33069) [4.16936]	-19.55981 (3.92735) [-4.98041]	0.791119 (40.9482) [0.01932]
R-squared	0.999102	0.995643	0.989190	0.996535	0.172177
Adj. R-squared	0.998728	0.993827	0.984686	0.995092	-0.172749
Sum sq. resids	0.006649	0.338500	0.132533	0.108995	11.84888
S.E. equation	0.023538	0.167953	0.105092	0.095304	0.993683
F-statistic	2671.025	548.3995	219.6132	690.3323	0.499171
Log likelihood	45.59261	10.22153	18.66079	20.42051	-21.77765
Akaike AIC	1.399179	-0.469059	-1.406754	-1.602279	3.086405
Schwarz SC	1.102389	-0.172269	-1.109964	-1.305489	3.383196
Mean dependent	23.08789	20.87987	20.30410	19.66411	22.29288
S.D. dependent	0.660037	2.137696	0.849221	1.360368	0.917583
Determinant resid covariance (dof adj.)		1.70E-11			
Determinant resid covariance		2.24E-12			
Log likelihood		113.7154			
Akaike information criterion		9.301707			
Schwarz criterion		7.817754			
Number of coefficients		30			

Source: Author's Computation 2025, using E-view 12.0 version

The table highlights the long run relationship. The regression equation as depicted thus;

$$SOS_t = 1.906722\beta_{0t-1} + 0.909992SOS_{t-1} + 0.211498SRA_{t-1} + 0.109836VAT_{t-1} + 0.085365PIT_{t-1} + 0.002053AGR_{t-1}$$

All the variables of the study are in conformity with the model a prior expectation by being positively impacted

economic growth in Nigeria during the period of the study.

Statutory revenue allocation (SRA) has positive coefficient (0.211498), indicating positive impact between statutory revenue allocation and social services expenditure (SOS) in Nasarawa state. The coefficient of statutory revenue allocation implies that a unit change in SRA tend to increases the SOS by 21.1%, respectively, during the period under review.

Value added tax revenue (VAT) has positive coefficient (0.109836), indicating positive impact between value added tax allocation and social services expenditure (SOS) in Nasarawa state. The coefficient of value added tax allocation implies that a unit change in VAT tend to increases the SOS by 10.9%, respectively, during the period under review.

Personal income tax revenue (PIT) has positive coefficient (0.085365), indicating positive impact between personal income tax allocation and social services expenditure (SOS) in Nasarawa state. The coefficient of personal income tax allocation implies that a unit change in PIT tend to increases the SOS by 8.5%, respectively, during the period under review.

Aid and grant revenue (AGR) has positive coefficient (0.002053), indicating positive impact between aid and grant allocation and social services expenditure (SOS) in Nasarawa state. The coefficient of aid and grant allocation implies that a unit change in AGR tend to increases the SOS by 0.2%, respectively, during the period under review.

The 0.999102 coefficient of multiple determinations (R^2) shows that up to 99% of the variations (changes) in the SOS were explained by the explanatory variables (SRA, VAT, PIT and AGR). The remaining 1% variations are unexplained due to other factors, which are affecting SOS but not captured in the model or due to the error of measurement (U_i). This is a

good fit of the model and shows that the data collected is suitable for the revenue allocation analysis in Nigeria.

The results of the VAR model demonstrated that statutory revenue allocation, personal income tax allocation, and aid and grant allocation all have a positive and statistically significant impact on social services expenditure in Nasarawa State. Specifically, a unit change in statutory revenue allocation leads to a 21.1% increase in social services expenditure in the long run, while a similar change in personal income tax allocation results in an 8.5% increase, and aid and grant allocation contributes a 0.2% increase. These findings suggest that these forms of revenue have been sufficiently and appropriately utilized for productive activities, directly improving social service delivery within the state. The study's findings regarding statutory revenue allocation are consistent with those of Tom and Ataide (2021), but differ from Emeka and Igwebuikwe (2020), who reported a negative impact of statutory revenue allocation on budget performance.

On the other hand, value added tax (VAT) allocation, while having a positive coefficient, showed an insignificant impact on social services expenditure. A unit change in VAT allocation was associated with a 10.9% increase in social services expenditure over the long run; however, this relationship was not statistically significant. Nonetheless, the study indicates that VAT allocation has the potential to contribute to increased social services expenditure if appropriately utilized for productive activities that enhance service delivery in Nasarawa State. Overall, these findings highlight the importance of effective management and strategic allocation of statutory, tax, and aid revenues to improve social services and budget performance over time.

Table 6: VAR Serial correlation Result

Lag	LRE* stat	df	Prob.	Rao F-stat	Df	Prob.
1	80.15110	25	0.2341	13.47761	(25, 12.6)	0.2341

Source: Author's Computation 2025, using E-view 12.0 version

The serial correlation test results unequivocally indicate the absence of significant serial correlation in the residuals, thereby validating the model's adequacy. Specifically, the Lagrange Multiplier (LRE) statistic of 80.15110 with 25 degrees of freedom yields a probability value of 0.2341, while the Rao F-statistic of 13.47761 with (25, 12.6) degrees of freedom also produces a probability value of 0.2341. Given that both probability values substantially exceed the conventional 0.05 significance threshold, the null

hypothesis (H_0) of no serial correlation is unequivocally accepted. This favourable outcome suggests that the residuals are randomly distributed, devoid of any systematic patterns or autocorrelation, which is a critical assumption in time series analysis. Consequently, the results lend credence to the model's reliability, implying that it has effectively captured the underlying relationships between the variables, and no additional modelling is required to account for residual autocorrelation.

Impulse Response Analysis of Budget Performance to Shocks in Revenue Generation

The result of the impulse response of budget performance to revenue generation is presented below

Response to Cholesky One S.D. (d.f. adjusted) Innovations

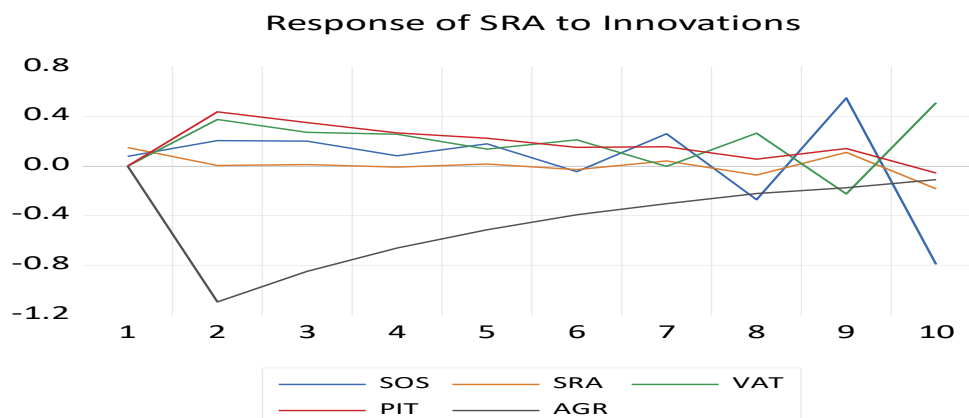


Fig 1: The impulse response of SOS to shocks in Revenue Generation in Nigeria

Source: Author's Compilation 2025, using E-view 12.0 version

From the impulse response of SOS to shocks in revenue allocation (SRA, VAT, PIT, and AGR) in Nigeria in a 10 year forecast period, the result shows SOS would response positively from own shock. The study also found out that SOS would response positively to shock in revenue allocation (SRA, VAT, and PIT). The

impulse response result also shows that SOS would response negatively to shock in (AGR).

Stability Test Result

The variables stability test result is hereby shown in figure 1 below:

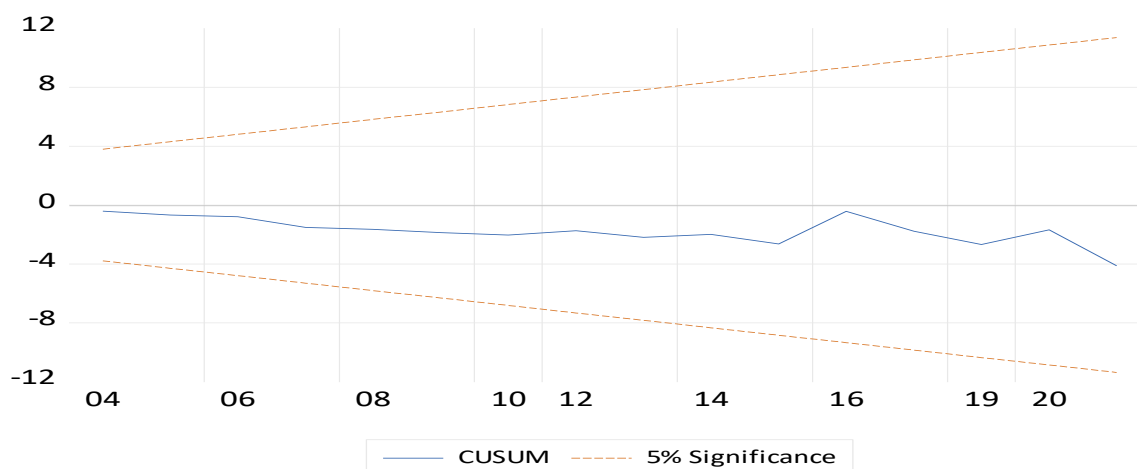


Fig 1: cumulative sum of the recursive residuals (CUSUM)

Source: Author's Compilation 2025, using E-view 12.0 version

The stability test result in figure 1 shows that the cumulative sum of the recursive residuals (CUSUM) lays between the two critical red lines at 5% level of significance. We therefore, reject H_0 of no parameter stability and conclude that the variable's parameters are stable and the model is stable for long-run forecasting. This signifies that the VAR estimates are structurally stable, consistent and reliable.

5. Conclusion, Recommendations and Policy Implications of Findings

The study investigated the impact of revenue generation on the budget performance of Nasarawa State, Nigeria, from 1999 to 2023, using unit root tests, cointegration analysis, causality testing, and the VAR model. Results revealed that variables are cointegrated at order one, justifying the use of the VAR model. Statutory Revenue Allocation, Value Added Tax

Revenue, Personal Income Tax Revenue, and Aid and Grant Revenue all demonstrated positive impacts on social services expenditure contributing 21.1%, 10.9%, 8.5%, and 0.2% respectively. Long-run equilibrium relationships among these variables were confirmed through the Johansen Cointegration Test, while the reliability of results was supported by the absence of serial correlation as shown in the Serial Correlation Test.

These findings highlight the crucial role of diversified revenue streams, efficient allocation, tax reforms, and effective aid management in financing social services. Policymakers are thus encouraged to prioritise strategic revenue optimisation initiatives, enhance budgetary allocations, and strengthen institutional frameworks to ensure sustained investment in essential social services and improve overall socioeconomic welfare in Nasarawa State.

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