ASSESSING THE IMPACT OF SELECTED INTERNALLY GENERATED TAXES ON INFRASTRUCTURE DEVELOPMENT IN BENUE STATE: A PATHWAY TO SUSTAINABLE DEVELOPMENT

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ABSTRACT

This study assessed the Impact of Selected Internally Generated Taxes on Infrastructure Development in Benue State. Time series data on the trends of Personal Income Tax (PIT), Value Added Tax (VAT), Produce Tax (PDT), Capital Gain Tax (CGT), Stamp Duties (SDT), and Infrastructural Development (INFRDEV) spanning 2000 to 2023 was elicited from the Benue State Internal Revenue Service, Ministry of Finance, and Planning Commission in the state. The Augmented Dickey-Fuller test was used to establish stationarity at first difference across the variables. Using relevant criterion (LR, FPE, the Akaike information criterion, Schwarz information criterion, and Hannan-Quinn information criterion), lag one was selected as the optimal lag for the study. The Johansen cointegration test has no evidence of long-run relationship in the model. The result showed a no-significant positive impact of PIT and CGT on INFRDEV and insignificant negative impact of VAT and SDT on INFRDEV in Benue State. On the other hand, PDT exerted a significant positive impact on IFRDEV in Benue State. Relevant post-estimation tests such as serial correlation and heteroscedasticity were carried out to show no evidence of autocorrelation and heteroscedasticity in the study. In addition, the impulse response and variance decomposition tests were estimated to show direction of a one standard deviation shock on the variables in the study. In line with the findings, the study recommended that the Benue State Government intensify measures in revamping the moribund industries in the state to enhance income level in the state and revenue yield needed for infrastructural development.

Keywords: *Taxation, Infrastructural Development, Personal income tax, Value Added Tax, Produce Tax and Stamp Duty Tax*

INTRODUCTION

Infrastructural development has been the bedrock of improved growth and development in advanced and emerging economies globally. This has led to effective tax policies and tax revenue utilization to enhance infrastructural development, notably in China. Between 2003 and 2016, infrastructural expansion through effective financing and utilization of tax revenue accounted for an average of 14% of China's growth rate (Dinlersoz & Fu, 2022). Consequently, capital stock in China stood at US$64 billion, resulting in improved electricity, water, and education among 100% of the population in 2022 (Africa Finance Corporation; 2024; World Bank, 2023).

In the US, through the "Decade of Infrastructure" program, US$1.2 trillion was earmarked for infrastructural development with Singapore being the world third best in infrastructure earmarking US$10 billion per annum for infrastructural development (Punch, 2023).

Although tax in itself is not a sufficient condition for infrastructural development, effective tax policies and utilization of tax revenue have become the paradigm shift in infrastructural expansion of advanced nations. Similar to the Decade of Infrastructure program in the US, the American Rescue Plan Act came to the fore in the aftermath of the global COVID-19 pandemic with measures such as expanded child tax credit, Tax Cuts and Jobs Acts (TCJA), tax rebate, and the progressive tax system to assuage the impact of the pandemic on low-income earners. In a ripple effect, capital gain tax exceeded US$2 trillion to reach a 40-year high in 2021 with revenue from the top 1 income tax group accounting for 45.8% of the total income tax in 2021 (York, 2024). With the increasing tax revenue utilization and increasing tax-to-GDP ratio in the US, 100% of the population has access to electricity and water with 95% of the population having access to health facility in 2022 (World Bank, 2024).

The progressive tax system with effective tax revenue utilization abounds also in the UK where 10% of tax-payer comprised of higher income groups accounted for over 60% of income tax receipts (Keep, 2024). Consequently, Keep (2024) revealed that the £980 billion tax revenue in 2023 accounted for 36% of the GDP in the UK, with effective utilization resulting in 100% of the UK population having adequate access to electricity and 98% to portable water in 2022 (World Bank, 2024).

Against the growing dynamics of tax-to-GDP at 36.1% in advanced nations and 28.6% in Latin America, tax-to-GDP in Africa stood at 15.6% in 2020 (Africa Finance Corporation, 2024). In addition to the low ratio, capital stock in Africa has been growing minimally to create infrastructural deficits among the teeming population. This can be gleaned from the total capital stock in China that was lower by 0.47 times to Africa in the 1960s but grew to US$64 billion in 2019 against the US$10 billion in Africa in the same period (Africa Finance Corporation, 2024). This has engendered infrastructural deficit with the need for an average of a 7.1% utilization of the GDP in SSA to enhance sustainable infrastructure against the prevailing 3.5% (Chinzara et al., 2023).

Despite the widening infrastructural expectation gap in Africa, significant progress has been made by Seychelles with 32.4% tax-to-GDP, 29.1% in South Africa, 17.4% in Kenya, and 14.1% in Ghana and Egypt, leading to 100%, 85.1%, and 76.0% of the population in Egypt, Ghana, and Kenya, respectively having access to electricity in 2020 (Michael, 2024; World Bank, 2024). Specifically, South Africa has made a significant effort in tax revenue with a R2.155 trillion tax revenue in 2023/2024 (SA News, 2024). In addition to improved tax revenue, emphasis on infrastructural development embedded in the

"Foundation for Inclusive and Sustainable Growth" resulted in infrastructural expenditure to the tune of R903 billion to enhance transport and logistics, energy, water, and sanitation.

Against the progress in few countries in SSA, Nigeria is adjudged the graveyard of abandoned projects (56,000) with an expected US$150billion annual expenditure over the next 30 years, amounting to US$3trillion to ameliorate the infrastructural deficit in the country (World Bank, 2023). From the African Infrastructural Development Index across 54 countries, Nigeria ranked 24th with 23.3 points against 88.3 points in Egypt and 82.9 points in war-torn Libya (Punch, 2023). The report showed further that only 60,000 km out of the 200,000 km road network in Nigeria is paved with increasing collapse of the national grip up to 138 times in ten years. Consequently, 179 million people in Nigeria are faced with water stress in 2024 with 63% of the population multi-dimensionally poor, and 26.5 million people prone to hunger in 2024 (NBS, 2022; Vanguard, 2024). Similarly, only 60.5% of Nigerians against 100% in Algeria, 97.9% in Cape Verde, and 85.1% in Ghana had access to electricity in 2020 (World Bank, 2024).

The growing infrastructural deficit despite measures such as the Vision 20:2020 to make Nigeria one of the top twentieth countries in the world and policies such as the single treasury account are not unconnected with leakages in tax revenue utilization, poor remittance, and embezzlement.

Similarly to the situation in Nigeria, Benue State is characterized by inept infrastructures, resulting in a state of emergency declared on infrastructural development by Governor Alia in the state (Duru, 2023). Specifically, the proposed N38b Makurdi Cargo Airport with 25 years concession to a Chinese company, CDC consortium that is instrumental to the development and revenue yield of the state has not seen the light of day. In addendum, road networks in the state are of deplorable condition, resulting in unease in the movement of agricultural produce with poor road tax and produce tax yield. Being the Food Basket of the Nation with increasing productivity in staple food such as yam, rice, cassava, and fruit crop such as mango and orange, the benefit of good road network to the economy of the state cannot be overemphasized. Neighboring eastern states depend largely on the state for yam and cassava production, while fruit crops formed the growing revenue base from trading with buyers from northern part of the country. However, the dilapidated road network in the state has continued to plague tax revenue yield and infrastructural development.

Consequently, the inept infrastructures in the state such as the moribund Otobi water works and inept portable water facilities in the state resulted in a cholera outbreak with 26 deaths in Agatu and Guma LGAs of the state in 2021 (Charles, 2021). Despite the growing infrastructural gap in the state, there is an increasing multiple tax system impeding small scale businesses and the ease in doing business in the state. Between Makurdi town to Daudu, a bordering community with Nasarawa State, there is an estimated 15

roadblocks by hoodlums operating as produce tax agents to extort money from transporters. This also applies to Makurdi-Otukpo to Enugu axis, thus engendering unfavorable business environment in the state. While produce tax constitutes a component of the tax structure in the state, license is being giving out to politicians who mobilize idle youth to distort economic activities in the state under the premise of road tax agents. This policy contrasts the unified tax system introduced by the administration of Ortom to minimize unscrupulous activities contributing to the decline in tax revenue in the state to meet infrastructural development. (Olisah, 2022).

More debilitating is the tax system in the state and the country with greater burden on low-income earners. While the US introduced favorable tax policies such as expanded child tax credit, Tax Cuts and Jobs Acts (TCJA), tax rebate, and the progressive tax system, with the UK's tax yield from higher income group, the burden of tax policies is greater on low-income earners in Benue State, Nigeria. This permeates into tax evasion and poor tax yield to enhance infrastructural development in the state. Against this backdrop with poor utilization of tax revenue, the study is motivated to assesses the impact of selected internally generated taxes on infrastructure development in Benue State as a pathway to sustainable development, from 2000-2023. The objectives of the study are therefore: (i) Examine the impact of Personal Income Tax (PIT) on infrastructural development in Benue State. (ii) Determine the impact of Value Added Tax (VAT) on the infrastructural development in Benue State. (iii) Evaluate the impact of Produce Tax (PDT) on infrastructural development in Benue State. And (iv)Assess the impact of Stamp Duties (SDT) on infrastructural development in Benue State. The rest of the study is presented as follows: section 2 presents the literature review involving the theoretical underpinning of the study and the review of empirical studies. Section 3 focuses on material and methods which captures the data and model specifications. Section 4 analyses the data and divulges the findings, while sections 5 conclude the paper and highlights the recommendations

2.0 REVIEW OF RELATED LITERATURE

2.1 Conceptual Framework

2.1.1 Taxation

Taxation is the process of imposing on citizens to pay certain portion to government from their income, profit or wealth (Adeira, 2020). It is the process of imposing a compulsory levy on the citizens by the government for transfer of resources from the private sector to the public sector to achieve social and economic objectives (Rosen, 2016). Taxation is the process of redistributing wealth, income, and resources by imposing a compulsory levy by the government on the citizen, using a rate commiserating with their income to enhance development and wellbeing.

2.1.2 Infrastructure

Infrastructure is the aggregate of the facilities and social amenities which are provided to enhance the standard of living of the citizen (Oliver et al, 2017). World Bank (1994) defined infrastructure as the set of fundamental facilities and systems that support the economic and social development of a region or country. Also, infrastructure is seen as the physical and institutional structures that enable the functioning of modern societies, including transportation, communication, energy, and water systems (Mallett, 2016).

2.1.3 Infrastructural Development

World Bank (2018) defined infrastructural development as the provision of physical infrastructure, such as transportation, energy, and water supply, as well as institutional infrastructure, such as governance and regulatory frameworks. Infrastructural development refers to the creation, improvement, and maintenance of physical structures and facilities that support economic growth, social welfare, and environmental sustainability (Aschauer, 2015). Infrastructural development encompasses the provision and upgrading of physical infrastructure, such as transportation networks, energy systems, water supply, and communication facilities (Estache, 2017).

2.1.4 Personal income tax

Personal income tax is the payment of levies on the income of individuals, partnerships, executors, and trustees (Olugbade & Adegbie, 2020). It is a direct tax levied on the income or profits of individuals, including wages, salaries, and other earnings (Warren, 2019). PIT is a tax imposed on the income of individuals, including employment income, business income, and investment income (James, 2017). Similarly, Harrison (2020) defines personal income tax as a tax on the income of individuals, including income from employment, self-employment, and investments. Moreso, it is a tax imposed on the income of individuals, including income from employment, business, and investments, to raise revenue for the government (Adeyinka, 2018).

2.1.5 Value Added Tax (VAT)

Value Added Tax (VAT) is a consumption tax levied on the value added to goods and services at each stage of production and distribution (Adeyeye, 2013). It is a tax on the value added to goods and services, which is ultimately borne by the final consumer (Ogbonna, 2017). Similarly, VAT is a multi-stage tax that is levied on the value added at each stage of production and distribution of goods and services (Nworgu, 2015). Also, VAT is a consumption tax that is designed to tax the value added to goods and services at each stage of production and distribution (Akanbi, 2018).

2.1.6 Produce Tax

Produce Tax is a tax imposed on the output of agricultural activities, including crops, livestock, and other farm products (Adebayo, 2017). Nwosu (2018) defined produce tax as a type of tax levied on the output of agricultural activities, including crops, livestock, and other farm products, to raise revenue for the government. Also, it is a type of tax levied on the production or cultivation of agricultural products, such

as crops, livestock, and other farm produce (Ola, 2019).

2.1.7 Stamp Duty Tax

Stamp Duty is a tax imposed on documents, such as contracts, agreements, and other instruments, to evidence the payment of duty (Kumar, 2019). It is a type of tax levied on documents, such as deeds, conveyances, and other instruments, to raise revenue for the government (Singh, 2017). Stamp Duty is a duty imposed on documents, such as contracts, agreements, and other instruments, to authenticate and validate their execution (Ojo, 2015). Also, stamp duty is a tax on documents, such as deeds, mortgages, and other instruments, to evidence the payment of duty and to raise revenue for the government (Adekunle, 2018).

2.2. Theoretical framework

2.2.1 The Socio-Political Theory of Taxation

The socio-political theory of taxation propounded by Adolf Wagner in 1883 forms the basis for this study. According to the theory, social and political objectives should be the major factors in selecting taxes which are to be deployed to address societal ills (Mandal, 2022). In other words, the tax system should be directed towards the health of the society, since individuals are integral part of the broader society (Bhartia 2009). The theory lies on the following assumptions; Taxation is a means to achieve social and economic goals, not just revenue collection; the state plays a significant role in redistributing wealth and income; taxation is a tool for social reform and poverty alleviation; the tax burden should be distributed according to ability to pay (progressive taxation); taxation influences the economy and society, and vice versa; the state's role in taxation is to correct market failures and promote social justice; taxation is a social contract between citizens and the state; the tax system should be flexible and adaptable to changing social and economic conditions (Wagner, 1883).

The Wagner's law is relevant to the study in showing the pathways for effective tax policies to address the needs of the citizens and societal ills rather than the prevailing fiscal measures with increasing revenue yields and declining infrastructures in Nigeria.

2.3 Empirical Review

Emeka (2024) investigated the effects of taxation on infrastructural development in Enugu State, Nigeria. Secondary data on personal income tax (PIT), pool tax (PTX), stamp duties (SDT), and infrastructural development (INFD) for the period 2000 to 2022 was used in the study. Pre-estimation tests such as ADF established integration at first difference I(1), while the Johansen cointegration test showed evidence of cointegration among the variables. Given the order of integration, the VAR technique was used as analytical method. The result showed a plausible but statistically insignificant positive impact of PIT on infrastructural development in Enugu State. On the other hand, PTX and SDT showed a no significant negative effect, with SDT exerting a significant negative effect on infrastructural development in the state.

The study performed the unrestricted VAR rather than the VECM (restricted VAR) despite the evidence of long-run relationship among the variables. It carried out post estimation test such as stability and heteroscedasticity but failed to perform impulse response and variance decomposition tests. The study recommended that the Enugu State Government implement stringent measures to enhance effective tax revenue utilization to enhance infrastructural development in the state.

Muojekwu & Udeh (2023) examined the effect of taxation on infrastructural development in Nigeria. Time series data retrieved from the Federal Ministry of Finance, FIRS, CBN, NBS, and world bank bulletins on petroleum profit tax (PPT), company income tax (CIT), value added tax (VAT), custom and exercise duties (CED), and capital expenditure (CAPEX) for the period 1992 to 2021 was used in the study. The ADF test showed that all the variables were stationary at first difference but the study failed to conduct Cointegration test. OLS was used as method of analysis to show a significant positive effect of all the predictors (PPT, CIT, VAT and CED) on infrastructural development in Nigeria. The study failed to carry out post-estimation tests to validate the classical assumptions. The study recommends adequate utilization of tax revenue by the Nigeria government to enhance infrastructural development in the country.

Adewale (2022) examined the impact of taxation on infrastructural development in Nigeria. Annual time series data retrieved from Federal Inland Revenue Service (FIRS) and National Bureau of Statistics for the period various years 2000 to 2021 was used for the study. The variables included in the study were infrastructural development (IFD), company income tax (CIT), personal income tax (PIT), value added tax (VAT), and stamp duties (STD) with the Error Correction Mechanism (ECM) as analytical method. Relevant pre-estimation test of ADF and F-bound showed a mixed order of integration and evidence of long-run relationship, respectively. The result of the ECM showed a no significant positive impact of VAT and STD on IFD, while PIT exerted a no significant negative impact on IFD for the period under investigation. Only CIT was statistically and theoretically plausible as a percentage increase in CIT will enhance IFD significantly in Nigeria. In addition, the study showed a speed of adjustment of 75%, indicating that disequilibrium in the model will be corrected speedily at 75. It recommended the need for tax policies embracing the cannons of tax with effective tax revenue utilization to enhance infrastructural development in Nigeria.

Ade, Odunayo and Kolawole (2021) investigated the impact of taxation on economic development: An infrastructural viewpoint. Primary data elicited from 365 respondents through questionnaire subjected to Cronbach Alpha for reliability test was used in the study. Descriptive and inferential statistics were used with the result from regression analysis showing a significant positive effect of taxation on infrastructural development in Nigeria. It recommends adequate understanding of tax dynamics by investors to enable investment and tax compliance. Beside VIF (which showed no evidence of collinearity) pre-and post-estimation tests were lacking in the study.

3.1 METHODOLOGY

The study adopted Ex-post facto research design to evaluate the impact of selected internally generated taxes on infrastructure development in Benue State as a pathway to sustainable development. The study used the Vector Autoregression (VAR) Model technique for analyzing data primarily generated from world Bank Statistical Bulletin and World Development Indicators (WDI) for the period, 2000 to 2023.

3.2 Model specification

The study adopted the VAR model employed by Emeka (2024) who investigated the impact of taxation on infrastructural development in Enugu State, Nigeria spanning from 2000 to 2022. The model incorporated the trends of personal income tax (PIT), pool tax (PDT), stamp duties (SDT), and infrastructural development (INFD) stated as follows;

$$\Delta INFD_t = \theta_1 + \sum_i^n \alpha_1 \Delta INFD_{t-i} + \sum_i^n \beta_i \Delta PIT_{t-i} + \sum_i^n \delta_i \Delta PTX_{t-i} + \sum_i^n \varphi_i \Delta SDT_{t-i} + \varepsilon_{1t} \quad (3.1)$$

$$\Delta PIT_t = \theta_2 + \sum_i^n \alpha_1 \Delta INFD_{t-i} + \sum_i^n \beta_i PIT_{t-i} + \sum_i^n \delta_i \Delta PTX_{t-i} + \sum_i^n \varphi_i \Delta SDT_{t-i} + \varepsilon_{1t} \quad (3.2)$$

$$\Delta PTX_t = \theta_3 + \sum_i^n \alpha_1 \Delta INFD_{t-i} + \sum_i^n \beta_i \Delta PIT_{t-i} + \sum_i^n \delta_i \Delta PTX_{t-i} + \sum_i^n \varphi_i \Delta SDT_{t-i} + \varepsilon_{1t} \quad (3.3)$$

$$\Delta SDT_t = \theta_4 + \sum_i^n \alpha_1 \Delta INFD_{t-i} + \sum_i^n \beta_i \Delta PIT_{t-i} + \sum_i^n \delta_i \Delta PTX_{t-i} + \sum_i^n \varphi_i \Delta SDT_{t-i} + \varepsilon_{1t} \quad (3.4)$$

However, the 4 × 4 matrix (equation 3.1 to equation 3.4) were modified by retaining INFD, PIT, and SDT, while incorporating VAT, and PDT into it. Thus, the current study includes Infrastructural Development Expenditure (IFDE), Personal Income Tax Revenue (PIT), Value Added Tax Revenue (VAT), Produce Tax Revenue (PDT), and Stamp Duties Revenue (SDT) stated in a functional form as follows;

Thus, the implicit model is specified as

$$IFDE_t = f(PIT_t, VAT_t, PDT_t, SDT_t) \quad (3.5)$$

The econometrics form of equation 3.6 follows;

$$IFDE_t = \beta_o + \beta_1 PIT_t + \beta_2 VAT_t + \beta_3 PDT_t + \beta_4 SDT_t + e_i \quad (3.6)$$

Equation 3.6 was expanded in a VAR form into a 5 x 5 vector of variables and β_i to β_n area 5 x 5 matrices of coefficient as shown in the explicit form below.

$$IFDE_t = \alpha_{10} + \sum_i^n = 1\alpha_{11} i IFDE_{t-i} + \sum_i^n = 1\alpha_{12i} PIT_{t-i} + \sum_i^n = 1\alpha_{13i} VAT_{t-i} + \sum_i^n = 1\alpha_{14} i PDT_{t-i} + \sum_i^n = 1\alpha_{15i} SDT_{t-i}\ \mu_{1t} \quad (3.8)$$

$$PIT_t = \alpha_{20} + \sum_i^n = 1\alpha_{21} i IFDE_{t-i} + \sum_i^n = 1\alpha_{22i} PIT_{t-i} + \sum_i^n = 1\alpha_{23i} VAT_{t-i} + \sum_i^n = 1\alpha_{24} i PDT_{t-i} + \sum_i^n = 1\alpha_{25i} SDT_{t-i}\ \mu_{2t} \quad (3.9)$$

$$VAT_t = \alpha_{30} + \sum_i^n = 1\alpha_{31} i IFDE_{t-i} + \sum_i^n = 1\alpha_{32i} PIT_{t-i} + \sum_i^n = 1\alpha_{33i} VAT_{t-i} + \sum_i^n = 1\alpha_{34} i PDT_{t-i} + \sum_i^n = 1\alpha_{35i} SDT_{t-i}\ \mu_{3t} \quad (3.10)$$

$$PDT_t = \alpha_{40} + \sum_i^n = 1\alpha_{41} i IFDE_{t-i} + \sum_i^n = 1\alpha_{42i} PIT_{t-i} + \sum_i^n = 1\alpha_{43i} VAT_{t-i} + \sum_i^n = 1\alpha_{44} i PDT_{t-i} + \sum_i^n = 1\alpha_{45i} SDT_{t-i}\ \mu_{4t} \quad (3.11)$$

$$SDT_t = \alpha_{60} + \sum_i^n = 1\alpha_{61} i IFDE_{t-i} + \sum_i^n = 1\alpha_{62i} PIT_{t-i} + \sum_i^n = 1\alpha_{63i} VAT_{t-i} + \sum_i^n = 1\alpha_{64} i PDT_{t-i} + \sum_i^n = 1\alpha_{55i} SDT_{t-i}\ \mu_{5t} \quad (3.12)$$

Where:

IFDE= Infrastructural Development Expenditure

PIT= Personal Income Tax Revenue

VAT= Value Added Tax Revenue

PDT =Produce Tax Revenue

SDT=Stamp Duties Revenue

μ =Stochastic error term used to represent other variables not captured in the model.

$\alpha_{10} - \alpha 55$ = coefficients of the variables.

n=maximum lag length

3.3 Model Estimation Techniques

The VAR estimation procedure is adopted in for the study. The estimation was carried out with Econometric Views (E-Views) suitable in estimating the parameters in a model. The VAR approach follows the OLS sufficient in estimating unknown parameters in a linear regression model. Thus, the data collected were analyzed Using VAR and tested to assess the causal relationship between the dependent (INFRDEV) and independent Variables (PIT, WHT, ROT, and PDT) with the aid of E-views using trends, charts, and tables.

4.1 Data Analysis and Discussions

4.1 Data Presentation

The secondary data collected for the study are presented in table as attached in Appendix I. The annul time series include IFDV, PIT, VAT, PDT, and SDT sourced from BIRS, MoF, Budget Office in Benue State for the period 2000 to 2023. The tests carried out are as follows;

4.2 Data Analysis

4.2.1 Trend Analyses

As presented in Appendix I, INFRDV and VAT are measured in billions; PIT and PDT are measured in millions, while the remaining variables fluctuate between thousands and millions of Naira (₦).

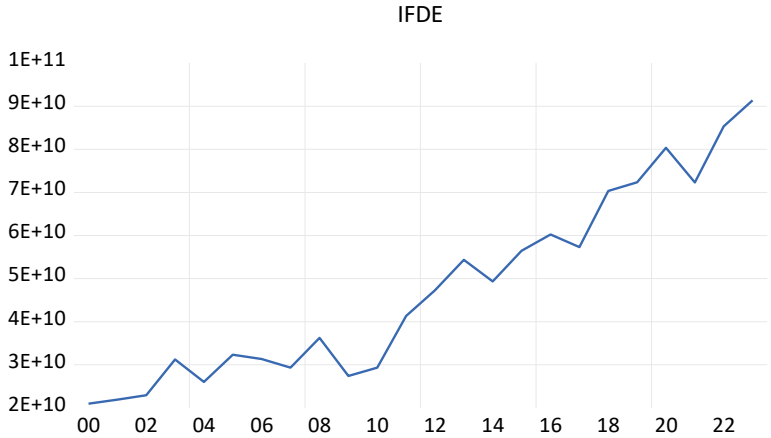

Figure 4.1: Trend of IFDE in Benue State (2000-2023)

Source: Authors computation using Eviews 12 (2024)

From Figure 4.1, it is observed that IFDE exhibited an upward movement from 2000 to 2023. IFDE witnessed a minimal increase from 2000 to 2002 followed by zigzag movement until 2008. The fluctuating rate of infrastructural development could be as a result of poor attitude of the government towards infrastructural development as the ratio of capital expenditure to total public expenditure in Benue State remained low. From 2008, IFDE witnessed a dip until 2009 with a recovery in 2010. The trend of IFDE

witnessed a persistent but zigzag upward movement until 2023. This bullish run may be as a result of improved awareness on the benefit and influence of infrastructural development to the growth and development of Benue State. It is noteworthy that the period 2020 to 2021 witnessed a slight decline due to Covid-19 pandemic, with a resurfaced upward movement till 2023. In general, the trend of IFDE saw a movement from ₦21,923,023,371 in 2000 to ₦91,382,345,041 in 2023.

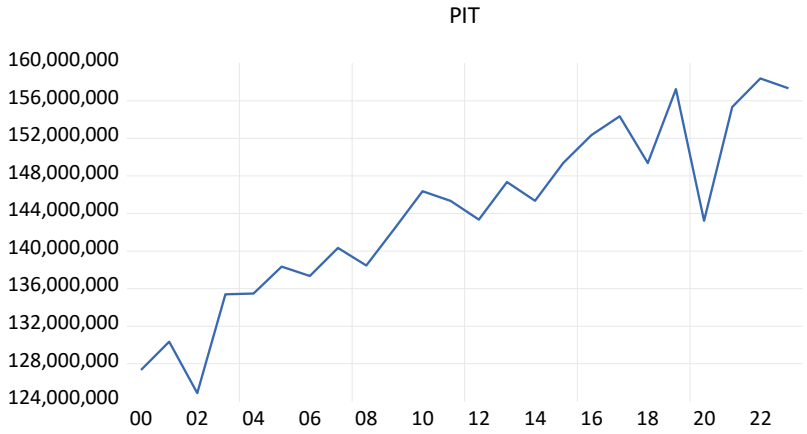

Figure 4.2: Trend of PIT in Benue State (2000-2023)

Source: Authors computation using Eviews 12 (2024)

It observed in Figure 4.2 that PIT witnessed an upward movement. The movement through 2001 declined in 2002, followed by an upward zigzag movement up till 2019. The year 2020 saw a drastic decline in PIT due to job losses in the post Covid-19 era. The upward movement resurfaced through 2022 with a slight decline in 2023. Be that as it may, PIT witnessed a positive movement from ₦127,341,877 in 2000 to ₦157,334,100 in 2023.

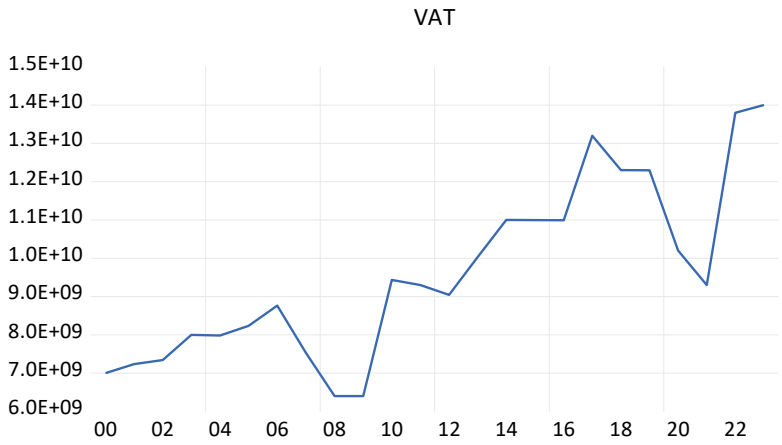

Figure 4.3: Trend of VAT in Benue State (2000-2023)

Source: Authors computation using Eviews 12 (2024)

From Figure 4.3, it is observed that VAT witnessed an upward movement up to 2006 followed by a significant decline until 2009. A zigzag upward movement ensues up to 2018, followed by a dip up to 2021 due the shock introduced by the COVID-19 pandemic. The movement through 2021 witnessed a significant increase in revenue yield from VAT up to 2023. In all, VAT experienced an increase from ₦7,002,345,732

in 2000 to ₦ 14,003,030,000 in 2023.

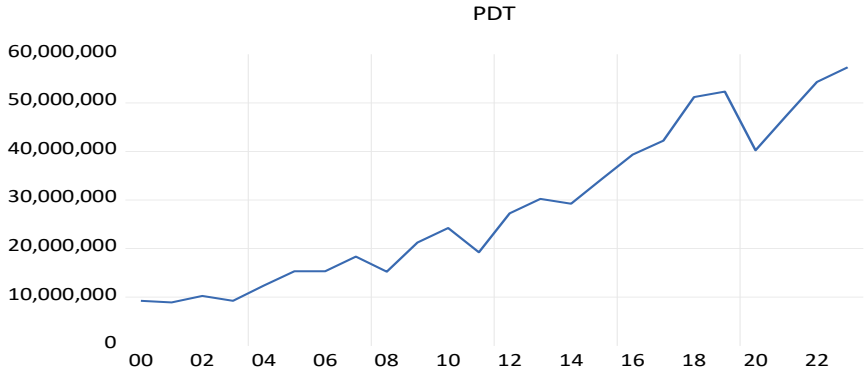

Figure 4.4: Trend of PDT in Benue State (2000-2023)

Source: Authors computation using Eviews 12 (2024)

From Figure 4.4, PDT witnessed a zigzag upward movement with a decline in 2020. Through 2021, PDT recovered an upward movement up till 2023. It is observed in the trend that PDT saw an increase in remittance from ₦9,217,000 in 2000 to ₦57,344,334 in 2023.

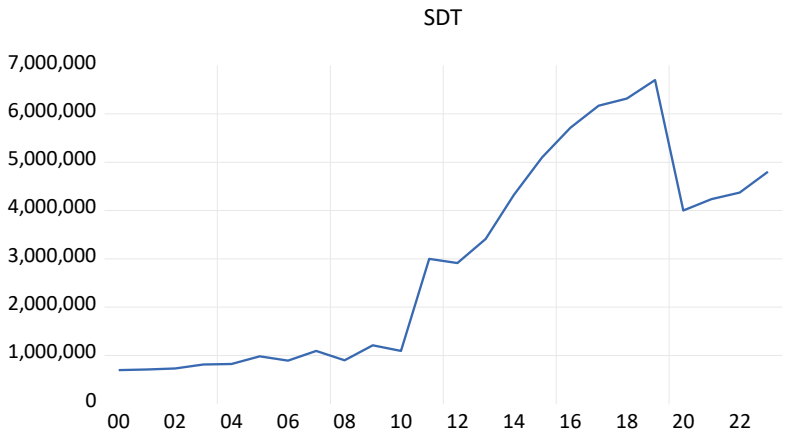

Figure 4.6: Trend of SDT in Benue State (2000-2023)

Source: Authors computation using Eviews 12 (2024)

From Figure 4.6, SDT witnessed a stable upward movement until 2010 but rose significantly until 2019. The period 2020 saw a significant dip with minimal recovery from 2020 through 2023. It is observed in the trend that SDT saw an increase in remittance from ₦697,000 in 2000 to ₦4,800,217 in 2023.

4.2.2 Descriptive Statistics Analysis

Descriptive statistics analysis results are presented in Table 4.1 below provide information on the characteristics of IFNRDEV, PDT, PIT, VAT and SDT, in Benue State between the periods 2000 to 2023.

Table 4.1: Descriptive Statistics

	INFRDEV	PDT	PIT	SDT	VAT
Mean	4.78E+10	28512214	1.44E+08	2958107.	9.62E+09
Median	4.43E+10	25734289	1.44E+08	2956000.	9.30E+09

Maximum	9.14E+10	57344334	1.58E+08	6700124.	1.40E+10
Minimum	2.10E+10	8900218.	1.25E+08	697000.0	6.40E+09
Std. Dev.	2.19E+10	16054527	9425815.	2133231.	2.30E+09
Skewness	0.496026	0.400369	-0.249148	0.329137	0.437470
Kurtosis	1.976560	1.801146	2.294836	1.609390	2.137021
Jarque-Bera	2.031597	2.078431	0.745554	2.367122	1.510253
Probability	0.362113	0.353732	0.688819	0.306186	0.469951
Sum	1.15E+12	6.84E+08	3.45E+09	70994565	2.31E+11
Sum Sq. Dev.	1.10E+22	5.93E+15	2.04E+15	1.05E+14	1.21E+20
Observations	24	24	24	24	24

Source: Authors computation using Eviews 12 (2024)

From Table 4.1, it is observed that IFNRDEV, PDT, PIT, SDT, and VAT, have average (mean) figures (4.78, 28512214, 1.44, 2958107, 9.62, and 1.32, respectively) that are closely related to the ideal values (median) (4.43, 25734289, 1.44, 2956000, 9.30, and 1.37, respectively) in the study. Importantly, the skewness (distribution of the series), kurtosis (peakness of the series), and the Jarque-Brea (the difference between the skewness and the kurtosis) are elaborated upon as follows. From the Skewness, it is observed that IFRDEV, VAT, and PDT have a normal distribution (0), while PIT have a negative distribution (-0.2,), indicating a long-left tail. From the kurtosis, it is observed that INFRDEV, VAT, PDT, and SDT are platykurtic, which indicate a flat and short tail. It means that the distribution is flat relative to the normal distribution (3). From the Jarque-Bera test, it is observed that INFRDEV, PIT, VATT, PDT, SDT are normally distributed. This lies with the p-values that all greater than 0.05%, signifying the rejection of the null hypothesis that the variables are not normally distributed.

4.3 Pre-Estimations Tests

4.3.1 Unit Root Test Results

The Augmented Dickey-Fuller (ADF) test estimated with Eviews 12 is presented in Table 4.4 below.

Table 4.2: ADF unit root test

ADF test	I(0)		ADF test	I(1)		Remark
Variables	Adjusted t-test	p-value	Adjusted t-test	p-value	Order Integration	Stationary
INFRDEV	-3.622033	0.3213	-3.632896	0.0000	I(1)	Stationary
PDT	-3.622033	0.1032	-3.644963	0.0011	I(1)	Stationary
PIT	-3.004861	0.7648	-3.632896	0.000	I(1)	Stationary
SDT	-3.622033	0.7569	-3.632896	0.0065	I(1)	Stationary
VAT	-3.623271	0.34512	-3.644963	0.0109	I(1)	Stationary

Source: Authors computation using Eviews 12 (2024)

Legend: significant

From Table 4.2, it is observed that the p-values of the ADF test at level (I(0)) are all greater than 0.05, thus, the null hypothesis that there is a unit root is accepted. From the result of first difference (I(1)), all the variables are stationary as their p-values are all less than the threshold value of 0.05. Thus, it is concluded in line with the result that, although the variables were non-stationary at level, performing the ADF test at first difference made all the variables stationary. The result suggests that the data set is suitable for VAR analysis given the order of integration.

4.3.2 Cointegration Test

Given that that the ADF tests failed at level but are significant at first difference, co-integration test is

required to ascertain whether the non-stationary variables at level will converge in the long run. As such, the Johansen co-integration best suited for VAR estimation was used in the study.

Table 4.3: Cointegration Test Result

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.
None	0.693799	60.58881	69.81889	0.2177
At most 1	0.466257	34.55151	47.85613	0.4719
At most 2	0.395192	20.73901	29.79707	0.3741
At most 3	0.299429	9.676438	15.49471	0.3065
At most 4	0.080548	1.847514	3.841466	0.1741

Trace test indicates no cointegration at the 0.05 level
denotes rejection of the hypothesis at the 0.05 level
MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.
None	0.693799	26.03730	33.87687	0.3185
At most 1	0.466257	13.81250	27.58434	0.8353
At most 2	0.395192	11.06257	21.13162	0.6411
At most 3	0.299429	7.828924	14.26460	0.3963
At most 4	0.080548	1.847514	3.841466	0.1741

Max-eigenvalue test indicates no cointegration at the 0.05 level
denotes rejection of the hypothesis at the 0.05 level
MacKinnon-Haug-Michelis (1999) p-values

Source: Authors computation using Eviews 12 (2024)

From the Johansen test of co-integration in Table 4.3, all the p-values from the Trace statistics are non-significant (greater than 0.05). Similarly, the values in Trace statistics up to at most 4 are less than the critical value at 5%, signifying no co-integration among the variables. In addition, the p-values from the Max-Eigen statistics are greater than 0.05 to show that there is no cointegration among the variables. As such, the null hypothesis of no cointegration in the model stands accepted. Consequently, the unrestricted VAR model is estimated in the study.

4.3.3 Causality Test

Table 4.4: Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.	Decision	Nature of Causality
PDT does not Granger Cause INFRDEV	23	14.2210	0.0012	Reject H0	Bi-directional
INFRDEV does not Granger Cause PDT		4.92403	0.0382	Reject H0	
PIT does not Granger Cause INFRDEV	23	5.66814	0.0273	Reject H0	Bi-directional
INFRDEV does not Granger Cause PIT		7.05901	0.0151	Reject H0	
SDT does not Granger Cause INFRDEV	23	2.77425	0.1114	Accept H0	No causality
INFRDEV does not Granger Cause SDT		0.17676	0.6787	Accept H0	
VAT does not Granger Cause INFRDEV	23	4.82859	0.0399	Reject H0	Unidirectional
INFRDEV does not Granger Cause VAT		3.88643	0.0627	Accept H0	

Source: Authors computation using Eviews 12 (2024)
Note: reject Ho accept Ho

From Table 4.4, it is observed that PDT and INFRDEV showed a bi-directional causality. The null hypothesis that PDT does not granger causes INFRDEV stands rejected as the significant p-value at 5% is less than 0.05. Similarly, the null hypothesis of no causality between INFRDEV and PDT is rejected, being that the significant p-value is less than 0.05. Thus, it is concluded that PDT and INFRDEV exhibit bi-directional relationships in Benue State. PDT influences INFRDEV as INFRDEV also exerts a significant influence on PDT in Benue State.

Similarly, it is observed that PIT and INFRDEV have bi-directional causality in Benue State. This follows the significant P-value that is less than 0.05, invalidating the rejection of the null hypothesis that PIT does not granger causes INFRDEV. The null hypothesis that INFRDEV does not granger causes PIT is also rejected as p-values is less than 0.05. Thus, there is a bi-directional flow between INFRDEV and PIT, implying that they exert influence on each other in Benue State.

It is observed that SDT and INFRDEV exhibit no causality, as such the null hypotheses that SDT granger causes INFRDEV and INFRDEV granger causes SDT are rejected. This follows the p-values that are greater than 0.05. Thus, there are no directional flow between SDT and INFRDEV in Benue State.

In contrast, it is observed that VAT and INFRDEV exhibit a unidirectional relationship. The null hypothesis that VAT does not granger causes INFRDEV is rejected, given that significant p-value at 5% is less than 0.05. On the other hand, the null hypothesis that INFRDEV does not granger causes VAT is accepted, given that the p-value is greater 0.05. As such, a unidirectional relationship exists between VAT and INFRDEV in Benue State.

PIT and PDT exhibit a unidirectional flow in Benue State. The null hypothesis that PIT does not granger causes PDT is accepted, while the null hypothesis that PDT does not granger causes PIT in Benue State is rejected. The result implies a unidirectional relationship between the variables in Benue State.

4.3.4 Lag Selection Test

Table 4.5: Result of Lag Selection Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-793.4446	NA	7.93e+33	83.73101	83.83042	83.74784
1	-765.2249	47.52794	6.22e+32	81.18157	81.47981	81.23204
2	-762.6201	3.838554	7.35e+32	81.32844	81.82551	81.41256
3	-760.4233	2.775001	9.32e+32	81.51824	82.21414	81.63601
4	-758.6300	1.887637	1.29e+33	81.75053	82.64526	81.90195
5	-757.9833	0.544563	2.16e+33	82.10351	83.19707	82.28858

Source: Authors computation using Eviews 12 (2024)

From Table 4.3, it is observed that FPE has the minimum value (6.22e+32). Accordingly, lag one was selected across the criteria. This suggests lag one is the smallest value to ensure stability, while enhancing the predictive capacity in the model. Thus, it is concluded that lag one is the optimal lag to minimize the model error while at the time optimizing the forecasting ability of the model.

4.4 Model Estimation Results

4.4.1 VAR Result

Table 4. 6: VAR Result

	INFRDEV	PIT	VAT	PDT	SDT
INFRDEV(-1)	0.447563	0.000138	-0.002660	0.494867	-4.97E-06
	(0.18788)	(0.00016)	(0.04495)	(0.21033)	(2.7E-05)
	[2.38221]	[0.8625]	[-0.05917]	[2.35279]	[-0.18173]
PIT(-1)	129.8784	0.123239	78.87754	0.048435	-0.010064
	(351.981)	(0.29491)	(84.2195)	(0.28707)	(0.05126)
	[0.36899]	[0.41789]	[0.93657]	[0.16872]	[-0.19633]
VAT(-1)	1.115035	-0.000522	0.162220	-2.75E-05	0.000272
	(1.28293)	(0.00107)	(0.30697)	(0.00105)	(0.00019)
	[0.86913]	[-0.48558]	[0.52846]	[-0.02630]	[1.45429]
PDT(-1)	763.9706	0.136845	74.90118	0.334490	-0.020557
	(349.628)	(0.29294)	(83.6565)	(0.28515)	(0.05092)
	[2.18510]	[0.46715]	[0.89534]	[1.17301]	[-0.40374]
SDT(-1)	-490.2854	-1.448536	152.5535	-0.002838	0.558771
	(1713.92)	(1.43602)	(410.094)	(1.39786)	(0.24960)
	[-0.28606]	[-1.00872]	[0.37200]	[-0.00203]	[2.23868]
C	-9.50E+09	86728059	-2.73E+09	-29093073	-3978203.
	(4.0E+10)	(3.3E+07)	(9.5E+09)	(3.2E+07)	(5776395)
	[-0.23946]	[2.60967]	[-0.28808]	[-0.89931]	[-0.68870]
R-squared	0.952841	0.807004	0.758227	0.942052	0.896962
Adj. R-squared	0.935157	0.734631	0.667562	0.920322	0.858323
Sum sq. resids	4.83E+20	3.39E+14	2.76E+19	3.21E+14	1.02E+13
S.E. equation	5.49E+09	4601477.	1.31E+09	4479208.	799796.7
F-statistic	53.88008	11.15056	8.362965	43.35191	23.21383
Log likelihood	-544.2729	-381.3256	-511.3794	-380.7062	-341.0808
Akaike AIC	47.93677	33.76744	45.07647	33.71358	30.26789
Schwarz SC	48.28236	34.11303	45.42206	34.05917	30.61348
Mean dependent	4.90E+10	1.45E+08	9.73E+09	29351136	3056416.
S.D. dependent	2.16E+10	8932479.	2.28E+09	15868361	2124859.

Determinant resid covariance (dof adj.)	2.42E+88
Determinant resid covariance	2.74E+87
Log likelihood	-2511.147
Akaike information criterion	222.0128
Schwarz criterion	224.0863
Number of coefficients	42

Source: Authors computation using Eviews 12 (2024)

The result in Table 4.6 stems from the 6x6 model (3.6 to 3.11) specified in chapter three. The result from equation 3.6/model one ($INFRDEV_t = \alpha_{10} + \sum_i^n = 1\alpha_{11i} INFRDEV_{t-i} + \sum_i^n = 1\alpha_{12i} PIT_{t-i} + \sum_i^n = 1\alpha_{13i} VAT_{t-i} + \sum_i^n = 1\alpha_{14i} PDT_{t-i} + \sum_i^n = 1\alpha_{16i} SDT_{t-i} \mu_{1t}$) showed

INFRDEV = -9.50E+09 +0.447563(INFRDEV-1) +0.000138(PIT) -0.002660(VAT) +0.000289(PDT) -4.97E06 (SDT)

(4.0E+10)	(0.18788)	(0.00016	(0.04495)	(0.00015)	(2.7E-05)
[-0.23946]	[2.38221]	[0.87517]	[-0.05917]	[1.88411]	[-0.18173]

From the result of model one/equation 3.6, evident in Table 4.6, only VAT and CDT exerted a negative relationship with IFRDEV in the study. The remaining variables (INFRDEV-1, PIT, VAT, and PDT) showed a positive relationship with INFRDEV in Benue State. The past value of INFRDEV (INFRDEV-1) exerts a significant positive impact on INFRDEV in Benue state as seen in the t-statistic (2.38). Using the rule of thumb also showed that the half value of IFRDEV (0.447563/2 = 0.2237815) is greater than the standard error (0.18788). As such, the past value of INFRDEV is a significant positive predictor of INFRDEV in Benue State Nigeria.

Similarly, PDT exerts a significant positive impact on infrastructural development in Benue State. This lies with the half-value of PDT (0.494867/2 = 0.24743) that is greater than the std.error (0.21033), signifying that PDT is a significant positive predictor of INFREV in Benue State. The positive relationship between the variables aligned with the a priori expectation established in the study.

Contrary, PIT has no significant impact on INFRDEV in Benue State, given that the half value of PIT (0.000138/2 = 0.00006) is less than the std.error (0.00016). This follows that PIT contributes minimally to infrastructural development in Benue State. However, the result is plausible in theory but statistically insignificant, as an increase in PIT will lead to a minimal increase in INFRDEV in Benue State.

Moreso, VAT has no significant impact on INFRDEV in Benue State, given that the half value of VAT (0.002660/2 = 0.00133) is less than the std.error (0.04495). This follows that VAT correlates inversely with infrastructural development in Benue State, as an increase in VAT will lead to a decline in IFRDEV in Benue State. The result contrasts the a priori expectation that an increase in VAT will lead to an increase in INFRDEV in Benue State.

SDT has no significant impact on INFRDEV in Benue State, given that the half value of SDT (4.97E-06/2 = 2.4853) is less than the std.error (2.7E-05). This follows that SDT correlates inversely with infrastructural development in Benue State, as an increase in SDT will lead to a decline in IFRDEV in Benue State. The result contrasts the a priori expectation that an increase in SDT will lead to an increase in INFRDEV in Benue State.

Given the coefficient of determination (R^2) of model one (0.95%), the model is adjudged fit for the study as the variables contributed maximally to the outcome variable in the equation. This is consistent with the favorable adj.R^2 value of 0.94%, signifying a good fit model for the study.

From model two/equation 3.7 ($PIT_t = \alpha_{20} + \sum_i^n = 1\alpha_{21i} INFRDEV_{t-i} + \sum_i^n = 1\alpha_{22i} PIT_{t-i} + \sum_i^n = 1\alpha_{23i} VAT_{t-i} + \sum_i^n = 1\alpha_{24i} PDT_{t-}$

$_{i} + \sum_{i}^{n} = 1\alpha_{26i}SDT_{t-i}\ \mu_{2t}$), the result showed;

PIT= 86728059 + 129.8784(INFRDEV-1) + 0.123239(PIT) +78.87754(VAT) +0.048435(PDT) + 0.010064(SDT)

(3.3E+07)	(351.981)	(0.29491	(84.2195)	(0.28707)	(0.05126)
[2.60967]	[0.36899]	[0.41789]	[0.93657]	[0.16872]	[-0.19633]

The result from model two indicates that all the variables exerted a positive relationship with PIT in Benue State.

The result from the third model/equation 3.8 ($VAT_t = \alpha_{30} + \sum_{i}^{n} = 1\alpha_{31}i INFRDEV_{t-i} + \sum_{i}^{n} = 1\alpha_{32i}PIT_{t-i} + \sum_{i}^{n} = 1\alpha_{33i}VAT_{t-i} + \sum_{i}^{n} = 1\alpha_{34}iPDT_{t-i} + \sum_{i}^{n} = 1\alpha_{36i}SDT_{t-i}\ \mu_{3t}$ -) showed;

VAT= -2.73E+09 +1.115035(INFRDEV-1) -0.000522(PIT) +0.162220(VAT) - 2.75E-05(PDT) + 0.000272 (SDT)

(9.5E+09)	(1.28293)	(0.00107)	(0.30697)	(0.00105)	(0.00019)
[-0.28808]	[0.86913]	[-0.48558]	[0.52846]	[-0.02630]	[1.45429]

The result from model three indicates that all the variables except PIT and PDT exert a positive relationship with VAT in Benue State. The model fits the data set as represented in the adjusted R^2 (66.7%), implying that the predictors jointly accounted for 66.7% of the variations in VAT in Benue State.

Result from the fourth model/equation 3.9 ($PDT_t = \alpha_{40} + \sum_{i}^{n} = 1\alpha_{41}i INFRDEV_{t-i} + \sum_{i}^{n} = 1\alpha_{42i}PIT_{t-i} + \sum_{i}^{n} = 1\alpha_{43i}VAT_{t-i} + \sum_{i}^{n} = 1\alpha_{44}iPDT_{t-i} + \sum_{i}^{n} = 1\alpha_{46i}SDT_{t-i}\ \mu_{4t}$) showed;

PDT= -29093073 +763.9706(INFRDEV-1) +0.136845(PIT) +74.90118(VAT) +0.334490(PDT) - 0.020557 (SDT)

(3.2E+07)	(349.628)	(0.29294)	(83.6565)	(0.28515)	(0.05092)
[-0.89931]	[2.18510]	[0.46715]	[0.89534]	[1.17301]	[-0.40374]

Consequently, the result availed that all except SDT exert a positive relationship with PDT in Benue State. The R^2 value (94.20%) and adjusted R^2 value (92.03%) in the model shows a fit model for the study as the exogenous variables contributed a significant 92.03% of the variations in PDT in Benue State.

The Result from the sixth model/equation 3.11 ($SDT_t = \alpha_{60} + \sum_{i}^{n} = 1\alpha_{61}i INFRDEV_{t-i} + \sum_{i}^{n} = 1\alpha_{62i}PIT_{t-i} + \sum_{i}^{n} = 1\alpha_{63i}VAT_{t-i} + \sum_{i}^{n} = 1\alpha_{64}iPDT_{t-i} + \sum_{i}^{n} = 1\alpha_{66i}SDT_{t-i}\ \mu_{5t}$) showed;

SDT= - 3978203 - 490.28541(INFRDEV-1) -1.448536(PIT) +152.5535(VAT) -0.002838(PDT) +0.558771 (SDT)

(5776395)	(1713.92)	(1.43602)	(410.094)	(1.39786)	(0.24960)
[-0.68870]	[-0.28606]	[-1.00872]	[0.37200]	[-0.00203]	[2.23868]

The result from model six indicates that all the variables except INFRDEV, PIT and PDT exert a positive relationship with SDT in Benue State. The R^2 value (89.69%) and adjusted R^2 value (85.83%) is an indication of a fit model, signifying that the explanatory variables jointly accounted for 85.83% of the variations in stamp duties in Benue State.

4.3 Discussion of Findings

Following the result of model one (3.8) in Table 4.6, the study revealed that PIT is theoretically plausible but statistically insignificant in determining infrastructural development in Benue State. The result implies that a percentage increase in PIT will lead to a 0.01% increase in infrastructural development in Benue State. The positive but insignificant impact of PIT on IFDE is not unconnected with poor tax structure with multiple taxation and unscrupulous activities where tax revenue is inadequately utilized to enhance

infrastructural development in the state. In line with result, Ade, Odunayo and Kolawole (2021) found a positive impact of personal income tax on infrastructural development in Lagos State. Similarly, Muojekwu and Udeh (2023) found a positive impact of income tax on infrastructural development in Nigeria. Moreso, Adewale (2022) in agreement with the result found a non-significant positive impact of PIT on infrastructural development in Nigeria. In addition to the regression result, a bi-directional relationship exists between PIT and IFDE during the period under investigation. The causality result implies that an increase in the variables will result in a positive impact in both directions in the state.

In contrast to the aforementioned, the result of VAT is not theoretically plausible and statistically insignificant, implying that a percentage increase in VAT will lead to a 0.2% decline in IFDE in Benue State. Put differently, an increase in VAT will permeate into a decline in infrastructural development in Benue State, which invalidates the a priori expectation. This result disagreed with Emmanuel, Oluwaseun and Monday (2024); Adegbite and Shehu (2022) which showed a positive impact on tax revenue on infrastructural development. In addition to the non-statistically significant relationship, the result showed a unidirectional relationship flowing from VAT to IFDE in Benue State. It suggests that adequate utilization of revenue from VAT will enhance infrastructural development in Benue State.

Also, the study investigated the impact of PDT on IFDE in Benue State. The result showed a significant positive impact of PDT on IFDE in Benue State. The result implies that a percentage increase in PDT will lead to a significant positive impact ($\beta = 49$) on infrastructural development in Benue State. The result agrees with John (2023) which showed a significant positive impact of produce tax on infrastructural development in Bhutan. In addition, PDT and IFDE exhibited a bi-directional relationship during the period under investigation. This implies that an increase in produce tax will lead to an increase in IFDE as an increase in infrastructural development through improved road network and transportation will enhance revenue yield from agricultural produce in the state.

The study assessed the impact of SDT on IFDE in Benue State. The result is not theoretically plausible and statistically insignificant in determining infrastructural development in Benue State. It implies that a percentage increase in SDT will result in a decline in infrastructural development in Benue State. In furtherance, SDT and IFDE exhibited no directional flow in the period under investigation. The result is consistent with Emeka (2024) which showed a negative impact of SDT on the revenue and infrastructural development the Nigeria. In contrast, Adams and Ekwule (2019) showed a positive but non-significant tax revenue on infrastructural development in Benue State.

5.1 Conclusion

This study assessed the impact of taxation on infrastructural development in Benue State. It finds a positive

but insignificant impact of PIT on IFDE and an insignificant negative impact of VAT and SDT on IFDE in Benue State. Only PDT exhibited a significant positive impact on infrastructural development in Benue State. In line with the findings, the study concludes that tax generated revenue has no significant positive impact on infrastructural development in Benue State, Nigeria. This lies with unscrupulous activities of tax authority with multiple taxation and inept tax revenue utilization in the state. Similarly, the state is characterized by poor road network to facilitate the movement of agricultural produce and road tax revenue yield. More poignant are the recurrent flood disasters and crop farmer-herder conflict that are increasingly distorting agricultural yields and the revenue of the state as a significant portion of the population comprised farmers whose livelihood contribute immensely to the state revenue.

5.2 Recommendations

The following recommendations were based upon the findings

i. Benue State is the Food Basket of the Nation with increasing food insecurity and low income level, which impede effective personal income tax yield. In addition, there are moribund industries such as Benue Brewery and Taraku Mills with the closure of Dangote Cement Company in Gboko which act as stress factors to poor PIT yield in the state. This calls for intensified investment by the Benue State Government to revamp the moribund industries in the state to enhance income level and personal income tax needed to improve infrastructures in the state.

ii. The state's inadequate tax revenue utilization to enhance infrastructural development in line with the tax-benefit principle has resulted in infrastructural expectation gap, necessitating a decline in VAT and infrastructural development in the state. In lieu, there is need for efficient tax policy by BIRS, incorporating the canons of tax to enhance tax revenue yield and infrastructural development in the state.

iii. Due to the agrarian nature of the state, produce tax correlates positively with infrastructural development in the state. While this is plausible in theory, the recurrent flood disasters and crop farmer-pastoralist conflict have continued as stress factors to poor agricultural yield in the state. This can be gleaned from the Variance Decomposition where PDT is strongly endogenous in the short-run but exogenous in the long run, implying that produce tax will decline significantly if shocks such as natural disasters and conflict are not addressed. To this end, there is a need for inclusive peace and development by the Benue State Government to enhance sustainable and innovative agricultural practices, revenue yield, and infrastructural development in the state.

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APPENDICES

Appendix I: Times series data on INFRDEV, PIT, VAT, PDT, and SDT

YEAR	INFRDEV	VAT	PIT	PDT	SDT
2000	20,971,021,943	7,002,345,732	127,341,877	9,217,000	697,000
2001	21,923,023,371	7,234,543,454	130,341,877	8,900,218	709,000
2002	22,934,023,213	7,343,456,543	124,874,232	10,213,231	729,781
2003	31,234,023,012	8,002,033,023	135,392,234	9,234,252	813,000
2004	26,034,543,213	7,983,233,234	135,473,271	12,345,219	823,000
2005	32,345,324,001	8,234,345,432	138,345,371	15,324,245	982,000
2006	31,345,021,341	8,764,345,335	137,342,461	15,324,213	892,000
2007	29,345,231,324	7,532,353,224	140,324,281	18,345,324	1,092,721
2008	36,234,012,272	6,400,000,000	138,471,245	15,234,335	900,827
2009	27,392,352,021	6,400,000,000	142,371,245	21,243,216	1,211,000
2010	29,321,284,023	9,432,234,443	146,371,372	24,234,334	1,093,650
2011	41,342,453,021	9,302,002,012	145,345,355	19,235,234	3,000,000
2012	47,291,345,321	9,043,340,043	143,345,323	27,234,244	2,912,000
2013	54,342,355,012	10,032,000,000	147,342,352	30,234,234	3,410,523
2014	49,345,321,043	11,000,000,000	145,362,345	29,234,234	4,321,620
2015	56,432,293,214	10,999,099,890	149,372,234	34,334,334	5,100,171
2016	60,234,021,392	10,992,000,000	152,345,352	39,344,232	5,712,000
2017	57,324,213,043	11.234,000,003	154,345,324	42,233,237	6,171,000
2018	70,345,721,432	12,304,300,000	149,372,234	51,234,234	6,317,400
2019	72,345,043,002	12,300,000,340	157,234,244	52,334,334	6,700,124
2020	80,382,321,832	10,203,000,305	143,234,123	40,232,334	4,000,712
2021	72,302,345,032	9,302,000,302	155,334,345	47,344,223	4,234,000
2022	85,324,034,024	13,798,146,690	158,372,244	54,338,342	4,370,819
2023	91,382,345,041	14,003,030,000	157,334,100	57,344,334	4,800,217

Source; BIRS, MoF, Benue State Planning Commission (2024)