

## Personal Income Tax and Domestic Debt Servicing: Verdict from Panel Fixed Effects

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Received 5 September 2024; Revised 30 September 2024; Accepted 30 September 2024

### Abstrak

**Tujuan** – Studi ini meneliti pengaruh PIT terhadap pembayaran utang domestik di negara-negara bagian barat daya, Nigeria.

**Desain/metodologi/pendekatan** - Data yang digunakan untuk mengukur dampak PIT terhadap pembayaran utang domestik dikumpulkan dari masing-masing dewan internal pendapatan negara bagian, CBN dan FBS dari 2011 hingga 2023. Data yang dikumpulkan dari semua negara bagian barat daya dianalisis dengan korelasi Pearson, VIF, dan alat analisis data panel seperti regresi gabungan, efek tetap, dan estimasi efek acak. Hausman selanjutnya dipicu untuk memilih model yang lebih baik di tengah efek tetap dan estimasi efek acak. Tes lain seperti uji autokorelasi, VIF, dan heteroskedastisitas juga dilakukan.

**Temuan** – Diungkapkan dari penelitian bahwa PAYE ditemukan memiliki efek positif pada pembayaran hutang domestik. Penilaian langsung dan pajak jalan juga memiliki hubungan yang baik dengan pembayaran utang domestik tetapi pajak lain berdampak negatif pada pembayaran utang domestik. Secara meyakinkan, korelasi positif terjalin antara pendapatan pajak penghasilan pribadi dan pembayaran utang domestik di Nigeria Barat Daya. Selain itu, PIT memiliki dampak positif, signifikan dan statistik pada pembayaran utang domestik di Nigeria Barat Daya. Ketika pengumpulan pajak penghasilan pribadi meningkat, pemerintah cenderung tidak terlalu bergantung pada utang domestik untuk membiayai kegiatannya.

**Keterbatasan/implikasi Penelitian** – Direkomendasikan bahwa pemerintah harus memperkuat mekanisme penegakan pajak untuk menampilkan langkah-langkah akuntabilitas dan transparansi yang tepat sehingga pendapatan yang direalisasikan dari PIT akan cukup besar untuk mengukur utang domestik secara signifikan di Nigeria Barat Daya. Pemerintah juga harus mengurangi pinjaman domestik tetapi mengaktifkan pajak yang tidak dieksploitasi yang tertanam dalam PIT, dan membatasi korupsi dalam dana pinjaman untuk penggunaan yang efektif di negara ini.



**Kata Kunci:** *Pelayanan Utang Dalam Negeri, PIT, PAYE, Pajak Jalan, Penilaian Langsung*

## **Abstract**

**Purpose** - This study examined the effect of PIT on domestic debt servicing in South western states, Nigeria.

**Design/methodology/approach** - Data gathered from all south western states were analyzed with Pearson correlation, VIF, and panel data analytical tools such as pooled regression, fixed effects and random effects estimations. Hausman was further ignited to select a better model amid fixed effects and random effects estimations. Other tests such as autocorrelation test, VIF, and heteroscedasticity were also conducted.

**Findings** - It was divulged from the study that PAYE was discovered having positive effect on domestic debts servicing. Direct assessment and road tax also possessed cordial relationships with domestic debt servicing but other taxes impacted domestic debt servicing negatively. Conclusively, positive correlation was established between personal income tax revenue and domestic debt servicing in South-Western Nigeria. Also, PIT has positive, significant and statistical impact on domestic debt servicing in South-Western Nigeria. When personal income tax collections increase, the government tends to rely less on domestic debt to finance its activities.

**Research limitations/implications** – It is recommended that government should strengthen tax enforcement mechanisms to display proper accountability and transparency measures so that revenue realized from PIT will be enormously enough to emaciated domestic debt significantly in south western Nigeria. Government should also lessen domestic borrowings but activate unexploited taxes embedded in PIT, and curtail corruption in borrowed funds for effective usage in the country.

**Keywords:** *Domestic Debt Servicing, PIT, PAYE, Road Tax, Direct Assessment*

## Introduction

Domestic debt plays a crucial role in Nigeria's economic development by providing the government with a means to fund essential expenditures and investment projects. But, the repayment of the principal and interest of the debts become a problem to the borrower. To fulfill the righteousness of repayment of debts, the government absolutely relies on the internally generated revenue which majorly recoup through personal income tax (PIT). PIT revenue represents a significant source of government revenue, with the potential to impact domestic debt servicing in various ways. Nigeria has been witnessing the significant improvement in PIT revenue recently, motivated by efforts to enlarge compliance and tax base through taxation revenue modernization and reforms in collection systems. Government increasingly depends on domestic borrowing to actualize funding needs in the country. The effects of PIT in influencing the debt scenery becomes the government determination. Low or High Pit levels can ignite government's borrowing comportment, fiscal policy and debt sustainability.

Government majorly depends on domestic debt to finance budget deficits, but personal income tax revenue impacts on financing instruments remains uncertain. Despite the potency of PIT as a pertinent government revenue source, government domestic debt is increasing daily, monthly and yearly. The examination of the impact of PIT revenue on domestic debt servicing is vital to make well-versed decisions on debt management, economic stability, and fiscal policy by the policy makers in southwestern states, Nigeria. Therefore, the paper intends to examine PIT revenue impact on domestic debt servicing, considering the relationship among government borrowing decisions,

economic outcomes and tax policy. By scrutinizing data on PIT collections, and domestic debt level, this study provides explanations into the volatility of PIT revenue effects on the domestic debt servicing trajectory in states. It also explores how tax policies and revenue collection fluctuations influence debt sustainability. The research outcomes will contribute to extant literature on debt management and south western fiscal policy by postulating valuable acumen for stakeholders and policymakers in devising effective approaches to stimulate justifiable debt servicing. Understanding of the relationship amid domestic debt servicing and PIT revenue is crucial for economists, investors and policymakers, seeking to gauge the sustainability and implications of Nigeria's debt volatility

## Literature Review and Hypothesis

### Literature Review Domestic Debts Servicing (DEBTSERV)

Therefore, debt is the term used to describe any financial resources used in a nation that are neither supplied or contributed by that nation nor associated in any other manner with that nation (Ndubuisi, 2017). All of the money that the government owes its own citizens is referred to as domestic debt. Typically, this debt is obtained by means of government securities, including bills, notes, and treasury bonds, which are used to fund other government expenses or budget shortfalls. There is a distinction between domestic and external debt. The former refers to the financial resources that the government owes to foreign creditors and international financial organizations (Van et al., 2021). Domestic debt is usually subject to the interest rates and economic conditions of the country in which it is denominated in local currency (Adebite & Mubarak, 2018; Ogboghro,

2023). Governments utilize domestic debt to finance a wide range of programs and projects, including infrastructure development, social programs, and government expenses. However, Ndubuisi (2017) argues that large levels of domestic debt have drawbacks, including squeezing out private investment, increasing interest payments, and straining government coffers. A nation's ability to preserve fiscal sustainability and economic stability depends on its ability to monitor and manage its levels of domestic debt (Akhanolu et al., 2018; Ncanywa & Setati, 2022; Ogboghro, 2023).

The management and repayment of debt obligations owed by a government to domestic creditors within its own nation, including interest and principal repayments as well as any costs related to the debt, is referred to as domestic debt servicing. To raise money from domestic investors and financial institutions, governments may issue debt securities like bonds, treasury bills, and other instruments (Ntekpere & Olayinka, 2020). Infrastructure projects, other projects, and government expenses can all be paid for with these monies. A government incurs debt that must be paid back when it takes out domestic loans. Ntekpere & Olayinka (2020) state that debt servicing entails making periodic payments on the outstanding debt, which usually consists of principal repayments to lower the debt and interest payments to repay creditors for their loans.

The goal of principal repayment and interest payments is to lower the total

amount of outstanding debt. Governments normally pay back interest payments and the principal amount borrowed throughout the course of the debt agreement in installments. The cost of borrowing money is represented by interest payments, which are determined by the interest rate mentioned in the debt arrangement. In exchange for their money loans to the government, domestic creditors receive periodical interest payments from governments. Domestic debt servicing may also involve fees, levies, and other costs related to debt servicing in addition to interest and principal repayments. These expenses may increase the government's overall debt payment burden.

According to Nwaobia et al. (2021) sustaining the government's creditworthiness and fiscal restraint requires effective management of domestic debt servicing. Paying bills on time and keeping your word about debt commitments foster goodwill with creditors and preserve your access to domestic capital markets for when you need to borrow money again. In order to manage debt obligations to domestic creditors through interest payments, principal repayments, and other related expenditures, domestic debt management is a crucial component of government financing (Ogboghro, 2023). Maintaining sustainable fiscal policies and market confidence in the government's capacity to manage its debt loads depend on sound debt management techniques.

### **Personal Income Tax (PIT)**

The government imposes PIT on the income of individuals. It is a direct tax levied on earnings, compensation, bonuses, rental income, interest income, and other types of income received by individuals (Adegbite & Akande, 2017). The amount of tax due is determined by subtracting any permitted deductions or exemptions from the individual's total income, or taxable income. Countries differ in their personal income tax rates and thresholds, and an individual's income level may also have a role. Higher income levels are generally taxed at higher rates, whilst lower income levels could be subject to zero (tax-exempt) or even lower rates. Revenue from personal income taxes is a significant source of funding for the government, which is used to pay for defense, social programs, public services, infrastructure, and other costs.

The nation's fiscal deficit, debt levels, and debt payments are all managed with the use of tax money gathered from personal income taxes. Revenue from personal income taxes is crucial for supporting a range of government initiatives and services that are necessary for society to function. State governments receive a sizable portion of their revenue from the personal income tax. The government uses this money to pay public employees' salaries, maintain infrastructure, and provide basic services including public safety, healthcare, and education (Adegbite et al., 2019; Adegbite, 2017; Efuntade et al., 2020). PIT is frequently utilized to finance social services that serve vulnerable populations. These programs include healthcare, welfare, food assistance, and housing initiatives that help to lower poverty and inequality while offering a safety net to those in need.

Revenue from personal income taxes is essential for funding infrastructure and education, claim Oyewobi & Falolu (2023). The building and upkeep of roads, bridges, public transit, and other infrastructure projects, as well as the repayment of domestic debt, can all be

financed by personal income taxes. Public schools, universities, and vocational training programs can also be supported by these funds. In addition, the collection of personal income taxes (PIT) for debt management goes toward paying national defense and security programs, which include the military, intelligence services, and law enforcement for the safety and security of the state and its citizens (Alawneh, 2017). The government receives a large portion of its funding from the personal income tax. Increased PIT collections can help the government's overall revenue, which it can utilize to pay bond interest, refund principal on outstanding loans, and service domestic debt. The fiscal policy of the government is influenced by the rates of personal income taxation. Increased money for the government from higher PIT rates inevitably aids in debt servicing responsibilities. Conversely, lower PIT rates result in less revenue, which can have an impact on the government's capacity to pay down its debt. A key element of debt sustainability is domestic debt servicing.

A government may encounter difficulties paying off its debt if it is unable to bring in enough money from PIT to pay off its domestic debt. Consequences could include credit downgrades, increased borrowing prices, and general economic instability. Personal income tax is important for a nation's budgetary stability and can directly affect paying off domestic debt (Adegbite et al., 2019). To maintain debt sustainability, stimulate economic growth, and guarantee enough income collection, governments must carefully balance their PIT policies.

### **HI1: PIT significantly impacts domestic debt servicing in Nigeria South Western states**

#### **Pay As You Earn (PAYE)**

Under the Pay As You Earn (PAYE) tax collection system, employers directly deduct income tax and national insurance contributions (NIC) from their employees'

paychecks and then submit the money to the appropriate tax authorities. Under the PAYE system, income tax is deducted at the source by the employer, saving employees from having to calculate and pay it individually. Employers are required by the PAYE system to determine, withhold, and send the appropriate amount of income tax and national insurance from their workers' paychecks, taking into account their tax code and earnings. Employers submit their employees' deductions to the tax authorities and make the required payments on their behalf.

In many nations, Pay As You Earn (PAYE) is a widely used method of tax collection that makes sure people pay their income taxes on time and effectively. It helps to spread the tax burden throughout the year and reduces the administrative burden on individual taxpayers. PAYE is an effective tax system in Nigeria for several reasons. PAYE is collected directly by employers from employees' salaries and remitted to the tax authorities thereby making the collection process more efficient as it reduces the burden on individual taxpayers to file returns and pay taxes separately. Efundade et al., (2020) revealed that PAYE helps broaden the tax base by capturing a large number of taxpayers who earn income through formal employment. This ensures that a significant portion of the workforce contributes to government revenue. PAYE provides a steady stream of revenue for the government as it is deducted regularly from employees' salaries thereby assisting government in budget planning and execution of domestic debt management as the government can predict its income from PAYE. The employer-employee relationship helps ensure compliance with tax regulations. Employers are responsible for deducting and remitting PAYE on behalf of their employees, reducing the likelihood of tax evasion. The withholding mechanism of PAYE reduces the opportunity for tax evasion as taxes are deducted at the source before employees receive their income

which ultimately increases overall tax compliance. PAYE is considered a progressive tax because it allows for tax relief and exemptions for lower-income earners which promotes social equity by ensuring that those who earn more contribute a larger share of their income in taxes.

PAYE is effective in Nigeria as it helps generate revenue for the government, promotes tax compliance, broadens the tax base, and facilitates social equity in the tax system. By collecting more PAYE taxes from individuals, the government can generate additional revenue to service its domestic debt. This can be achieved by expanding the tax base, increasing tax rates, or improving tax compliance among individuals subject to PAYE taxes. The government can allocate a portion of the revenue generated from Pay-As-You-Earn taxes specifically towards domestic debt servicing. The government can guarantee a steady stream of funding to fulfill its debt commitments by designating a specific amount of PAYE tax revenue for this purpose. The government arranges debt repayment plans so that they coincide with when PAYE taxes are collected. The government can guarantee that it has enough money on hand to pay off its debt when it's due by allocating debt payments in accordance with the amount of PAYE tax receipts. Additionally, using the money collected via PAYE taxes, the government may decide to refinance its current domestic debt.

According to Ntekpere and Olayinka (2020), refinancing may entail issuing new debt at lower interest rates in order to pay off existing debt. This can lower the total cost of debt payment and free up money for other government priorities. To maximize the use of PAYE tax revenue for servicing domestic debt, the government can implement a number of debt management techniques. In order to obtain better borrowing conditions, this may involve debt restructuring, terms negotiations with creditors, or the use of PAYE tax money.

Pay-As-You-Earn taxes can be a useful tool for the government to boost its ability to service domestic debt and make sure it can continue to make regular and sustainable debt payments, according to Onwelumadu & Onuora (2021).

To effectively use PAYE tax revenue for debt servicing, sensible budgeting techniques, strategic debt management, and efficient tax collection are essential.

### **HI2: PAYE significantly impacts domestic debt servicing in Nigeria South Western states**

#### **Direct Assessment (DIRECTASS)**

The term "direct assessment" in personal income tax refers to a technique of tax assessment in which the tax authority determines an individual's tax due using data that the taxpayer has submitted. In contrast, under the withholding tax system, the payer or employer deducts taxes straight from the employee's income. A tax return outlining the taxpayer's income, credits, deductions, and other pertinent information must be submitted under a direct assessment system (Adegbite et al., 2019; Adegbite, 2017). After that, the tax authorities examine this data to ascertain the taxpayer's tax obligation. In order to determine the right amount of tax owing, this technique depends on the taxpayer self-reporting. To do this, individuals must accurately record their income and expenses. Many countries employ direct assessment methods as part of their personal income tax systems. With this approach, tax estimates can be customized to each person's unique financial circumstances. For their tax due to be accurately calculated, taxpayers must also maintain accurate records and adhere to reporting rules. Accurate appraisal of people or entities based on their unique circumstances is made possible via direct assessment.

This approach yields a more accurate evaluation than indirect approaches since it includes evaluating income, properties, or

assets directly to ascertain their value or tax obligations. Assessing people or companies according to their real assets, properties, or income helps ensure justice in taxation. This promotes tax justice by preventing underreporting and tax evasion. In direct assessment, individuals may understand how their tax liabilities are determined based on their unique circumstances. Direct assessment leads to a transparent tax assessment procedure. Assuring accountability in tax collection and fostering trust in the tax system are two benefits of this transparency. By concentrating on high-risk regions or people with complicated financial circumstances, direct assessment enables tax authorities to allocate resources effectively. This focused strategy can enhance tax collecting operations and raise compliance rates. By precisely determining the tax responsibilities of people or companies, direct assessment can result in higher tax revenues for the government. Public services, infrastructure improvements, and other government endeavors may benefit from this funding.

For the purpose of guaranteeing accurate, equitable, and transparent tax collection, maximizing resource allocation, and producing income for the government, direct assessment is crucial (Ogboghro, 2023). Maintaining the integrity of the tax system and encouraging taxpayer compliance are vital functions it performs. The efficient use of direct assessment in PIT allows tax authorities to collect individual taxpayer taxes more precisely and on time. The government can use this extra money to pay for activities, including debt service. Reduced government budget deficits can lessen the demand for borrowing and, in turn, lower the amount of domestic debt. This can be achieved by more tax collection from direct assessment. Higher direct assessment tax receipts may put the government in a better position to control the amount of debt it has, which would ultimately enhance debt sustainability and save costs related to servicing domestic debt.

According to Van et al. (2021), the government can benefit from lower borrowing costs in the domestic debt markets if investors have greater faith in the government's financial management capabilities due to increased revenue from direct assessments. Effective direct assessment was also argued to have a good influence on investor confidence, government revenue, smaller budget deficits, and debt sustainability, all of which are favorable for servicing domestic debt.

### **HI3: Direct assessment significantly impacts domestic debt servicing in Nigeria South Western states**

#### **Road Tax (ROADTAX)**

This tax, which is imposed on automobiles to pay for the upkeep and building of roads and highways, is sometimes referred to as vehicle tax or vehicle excise duty (VED). The type, size, emissions production, and fuel type of a vehicle are some of the elements that determine how much road tax a vehicle owner must pay (Adegbite & Azeez, 2021). Road tax is a legal obligation in some nations to drive a car on public roads, and it must be paid annually. Failing to pay road tax may lead to fines, penalties, or even the car being impounded. Governments utilize road tax money to pay for infrastructure improvements, road maintenance, and other transportation-related costs. The purpose of this tax is to make sure that car owners pay a portion of the expenses related to utilizing and enjoying the benefits of road infrastructure. The government imposes a levy on vehicles known as road tax, vehicle tax, or vehicle registration tax. It frequently depends on elements including the kind of car, weight, emissions, and engine size. The road tax has a number of benefits. Adegbite & Azeez (2021) list the provision of vital funds for the building, upkeep, and enhancement of transportation infrastructure, such as roads, bridges, and highways, as one of the primary benefits of road tax.

For transportation networks to be both safe and effective, this revenue is essential. Road tax can be designed in a way that takes into account things like vehicle size, emissions, and usage, in keeping with the "user pays" idea. By making higher taxes payable by individuals who drive more often or drive vehicles that require more upkeep, justice and equity in the financing of transportation infrastructure are promoted. Certain road tax structures consider how cars affect the environment, including emissions levels. By encouraging the adoption of cleaner, more fuel-efficient cars, increasing taxes on vehicles with higher emissions can support environmental sustainability.

Governments rely heavily on road taxes as a major source of funding for a range of programs and services beyond transportation infrastructure. These programs and services include social services, economic development, government initiatives, and debt management inside the country. In addition, road taxes can be employed as a weapon for policy to affect driving and vehicle ownership habits. In order to fund transportation infrastructure, promote fairness and equity in tax collection, address environmental concerns, generate revenue for the government, and support government debt servicing, among other things, tax incentives and penalties, for instance, can encourage the adoption of electric vehicles or discourage the excessive use of private vehicles in congested urban areas.

### **HI4: Road tax significantly impacts domestic debt servicing in Nigeria South Western states**

#### **Other Tax (OTHERTAX)**

Any tax other than income tax is referred to as "other tax" in general. This can include a range of state-level taxes imposed by governments, including inheritance taxes, capital gains taxes, excise taxes, value-added taxes (VAT), property taxes, and other taxes (Adegbite et al., 2019; Dewi et al., 2024; Ogundana et al., 2017; Paramitha & Kurnia,



2023). These taxes, which are generally levied on various kinds of transactions, assets, incomes, or wealth, provide governments with a significant stream of cash with which to fund public services and infrastructure. Depending on their location and situation, people may be subject to a number of additional personal income taxes in addition to the state income tax. State income tax, self-employment tax, Medicare tax, municipal income tax, capital gains tax, dividend tax, and security tax are a few of these (Okoror et al., 2019).

### **HI5: Other tax significantly impacts Domestic debt servicing in Nigeria South Western states**

#### **Theoretical Review**

##### **The Ricardian Equivalence Theory (RET)**

David Ricardo, a well-known classical economist, proposed the RET. He initially introduced the concept in the early 1800s, and his work was published posthumously in 1820. According to Ricardo's theory of Ricardian equivalence, how a government funds its spending has no long-term impact on the economy. It assumes that, regardless of how the government chooses to fund its spending, changes in taxation and borrowing will have similar impacts on aggregate demand and economic outcomes. According to RET, people modify their behavior to mitigate the effects of government deficits, therefore it makes no difference whether a government finances its spending through taxes or borrowing. The theory is founded on a compelling and plausible argument that emphasizes how government debt serves as a substitute for future taxes. The effect of government borrowing on private behavior can be studied using a well-defined theoretical framework. The Ricardian equivalence hypothesis emphasizes the idea that future tax increases due to current government deficits motivate people to save more money to offset these tax responsibilities. The emphasis on budgetary sustainability may improve long-term

structural stability. The notion is that maintaining discipline on government spending, tax revenue, and private savings might all offset excessive government borrowing, so mitigating the risk of unsustainable deficits and debt accumulation.

However, RET is based on several strong hypotheses, including full knowledge, perfect foresight, and reasonable human expectations. These assumptions may not hold true in practice, resulting in a disagreement between theory and practice. Critics argue that people's behavior may not totally change in response to government deficits, particularly when liquidity is limited, the credit market is flawed, or future tax rules are unpredictable. This can weaken the theory's empirical validity. Furthermore, while rising demand for public sector funds may result in higher interest rates and less government borrowing, which could have an impact on economic growth, the theory ignores the possibility that government borrowing may temporarily drown out private investment. The application of Ricardian equivalence theory may produce incorrect policy findings if consumers do not fully offset government deficits through increased savings, hence underestimating the stimulative influence of government spending during economic downturns. In conclusion, while RET provides a compelling theoretical framework for understanding the relationship between government revenue, deficits, debts, private saving, and economic behavior, it is also relevant to our research. Analyzing its practical implications and policy relevance necessitates a careful examination of its assumptions and limits. It also claims that in response to changes in government debt and taxation, both the government and individuals will alter their saving and consumption habits.

To put it another way, people save more when they anticipate future tax increases to pay for government debt because they are foresightful. This

demonstrates how personal income tax revenue affects the servicing of domestic debt by affecting people's decisions about how much to save and how much to spend.

### **Empirical Review**

El-Yaqub et al., (2024) investigated domestic debt impact on Nigerian economy between 1980 and 2021 to establish domestic debt impact on GDP. Results from employed Debt Management Office (DMO) and CBN data which were scrutinizingly analyzed with regression model, and Unit Root Test, ARDL Bound Test displayed that domestic debt negatively impacted Nigeria's economy. Thus, the study only gauged domestic debts' impact on the economy but absolutely not in the same line with the current study on tax revenue impact on domestic debts servicing in south western states, Nigeria. In another study by Oyewobi & Falolu (2023) which examined the incessantly increasing public debts despite increased consumption expenditure and tax revenue in Nigeria. The study invariably gauged tax revenue impact on public debts in Nigeria. Results obtained from Data extracted from DMO, FIRS and Central Bank of Nigeria (CBN) between 1992 and 2022 which were analyzed with Ramsey Reset Test and OLS revealed that positive relationships existed amid tax revenue, public debts and consumption expenditure. Also, correlation between public debts and consumption expenditure was statistically significant but the correlation between public debts and tax revenue was statistically insignificant. The study focused majorly on public debts and tax revenue which is different to the current study on domestic debts servicing and tax revenue. Hence, their policies are absolutely different from each other.

Ogboghro (2023) compared Ghana and Nigeria's economic growth and domestic debt (DM) between 2000 and 2021. Data collected from Ghana Annual Debt Statistics and CBN data were thoroughly analyzed with descriptive

statistics, multiple regression and correlation analysis. The outcomes indicated that DM has no impact on Nigeria RGDP but has substantial impact in Ghana. The study finally concluded that inconsistent effects of DM existed on economic growth both in Nigeria and Ghana. However, the study covered two countries as against the current study which absolutely covered Nigeria only with the examination of domestic debts servicing and tax revenue. Contrarily, Okeke et al., (2022) examined internal borrowing's impact on Nigeria's economy. Results garnered from data collected from CBN and DMO which were ultimately analyzed with regression and correlation analysis discovered that internal borrowings impacted economic growth negatively, but positive and cordial relationships existed amid internal borrowings and domestic debt servicing in Nigeria. The study however was limited to internal borrowings, domestic financing and economic growth but the current study focuses on the taxation revenue effect on Southwest states' domestic debt servicing.

Ncanywa & Setati (2022) investigated South Africa public debt and inflation expectations impact on taxation. The results from the employed granger causality analytical method and ARDL model established a long-run, significant and positive connection between taxation and inflation expectations, but a negative significant connection between taxation and public debt. The study concluded that inflation rate rises concurrently with taxable income, and South African financed its debts absolutely through borrowing instead of taxation. However, the study policy was limited to South Africa but not Nigeria, and study employed granger causality analytical method and ARDL model as against the current study which employed panel data analytical model. Nwaobia et al. (2021) examined tax revenue effects on Nigeria foreign debt from 1981 to 2019. The data sourced from FIRS and CBN Statistical Bulletin were adjudicated validated and

analyzed with both inferential and descriptive statistics. Findings established that tax revenue significantly impacted Nigeria foreign debt. Nevertheless, the study was invariably confined to Nigeria foreign debt as dissimilar to the current study on south western states' domestic debt servicing with PIT revenue weapons.

Ntekpere & Olayinka (2020) examined tax revenue effect on Nigeria capital expenditure and public debt from 1999 to 2018. Data which were extracted from CBN data were analyzed with regression method, descriptive statistics, unit root, co- integration and VECM model discovered that tax revenue impacted Nigeria public debt statistically, significantly, and positively but negatively impacted Nigeria capital expenditure. Thus, the study examined the whole Nigeria but the current study examined south western states, a geopolitical zone out of six zones in Nigeria. In another study in Nigeria, Akhanolu et al. (2018) investigated the government's debt impact on Nigerian economic growth between 1982 and 2017 by employing a regression method. The results of data collected through CBN data established that external debt negatively impacted Nigeria economy but internal debt significantly and positively impacted Nigeria economy. Nonetheless, the study focused absolutely on government's debt and Nigerian economic growth but not in consonance with the current study on south western states' PIT revenue and domestic debt servicing.

Haffner et al. (2017) examined domestic debt impact on Sierra Leone economic growth between 1970 and 2015. Results from cointegration, ARDL model and regression established that domestic debt impacted Sierra Leone economic growth negatively. However, the study was established in Sierra Leone but not in south western states, Nigeria, therefore, policy formulated cannot be generalized. Elomobed et al. (2017) empirically studied the relationship amid Nigeria economic growth

and public debt between 1980 and 2015. The study embraced the VECM approach to analyze data collected through DMO and CBN. The variables employed were domestic debt, real gross domestic product (RGDP), domestic private savings and foreign debt. Results divulged that external debt and domestic debt had a significant negative effect on Nigeria economic growth. Meanwhile, the study researched Nigeria economic growth and public debt with involvement of DMO and CBN data as against the current study on domestic debt servicing and tax revenue with full involvement of data from each state's Inland Revenue.

Essien et al. (2016) examined public sector borrowings' effect on prices, output, and interest rates in Nigeria. The data majorly and solely collected from CBN with full involvement of vector autoregressive, granger causality, variance decomposition and impulse response tests. The study established that external debt upsurge prime lending rate in the country. However, the study concluded that domestic and external debt impacted output and general price level insignificantly in Nigeria. Thus, the study is from Nigeria but the concepts examined was not in consonance with the current study. Babu et al. (2015) empirically investigated domestic debt effect on economic growth in East Africa Community (EAC) between 1990 and 2010. The study majorly adopted Solow growth model for debt, and unit roots through Levin-Lin-Chu test (LLC) as well as Hausman test for selection of acceptable model between fixed-effects and random model. The results demonstrated that domestic debt possessed positive, significant, and statistical effect on EAC GDP growth rate. Nevertheless, the study was ignited from EAC and majorly focused on growth rate but not in tandem with the current study on domestic debt servicing in south western states, Nigeria.

The extant researchers examined domestic debt impact on Nigerian economy (El-Yaqub et al. (2024); Oyewobi & Falolu

(2023); Ogboghro (2023); Okeke et al. (2022); Akhanolu et al. (2018); Haffner et al. (2017); Elom-obed et al. (2017) and Babu et al. (2015). Others examined many concepts different from the current study (Ncanywa & Setati 2022; Nwaobia et al. 2021; Ntekpere & Olayinka 2020; and Essien et al. 2016) within Nigeria and other countries with different collection and analytical tools. But this study contributes to the extant literatures due to the fact that PIT impact on south western states' domestic debt servicing is scarce among the extant literatures with unique analytical tools such as pearson correlation, autocorrelation test, VIF, heteroscedasticity, panel data tools such as pooled regression, fixed effects and random effects estimations as well as Hausman which was ignited to select better model amid fixed effects and random effects estimations.

### Research Method

Data used to gauge the impact of PIT on domestic debt servicing were assembled from each state's internal board of Revenue, CBN and FBS from 2011 to 2023. Data gathered from all south western states were analyzed with pearson correlation, VIF, panel data tools such as pooled regression, fixed effects and random effects estimations. Hausman was ignited to select a better model amid fixed effects and random effects estimations. Other tests such as autocorrelation test, VIF, and heteroscedasticity were also conducted.

### Model Specification

To examine the effect of impact of PIT on domestic debt servicing in south western states, PIT components such as PAYE, DIRECTASS, ROADTAX, and other taxes are the independent variables while domestic debt servicing (DEBTSERV) is dependent variable, and ministry department and agencies' revenue (MDSAREV) is control variable. Model which is econometric is stated below:

$$DEBTSERV = f (PAYE \text{ DIRECTASS ROADTAX MDSAREV OTHERTAX } \mu) \quad 1$$

$$DEBTSERV_{it} = \beta_0 + \beta_1 PAYE + \beta_2 DIRECTASS + \beta_3 ROADTAX + \beta_4 MDSAREV + \beta_5 OTHERTAX + u \quad 2$$

### Random Effect Model

$$DEBTSERV_{it} = \beta_0 + \beta_1 PAYE_{it} + \beta_2 DIRECTASS_{it} + \beta_3 ROADTAX_{it} + \beta_4 MDSAREV_{it} + \beta_5 OTHERTAX_{it} + \dots + y_2 E_2 + \dots + y_n E_n + u_{it} + \varepsilon_{it} \quad 3$$

### Fixed Effect Model

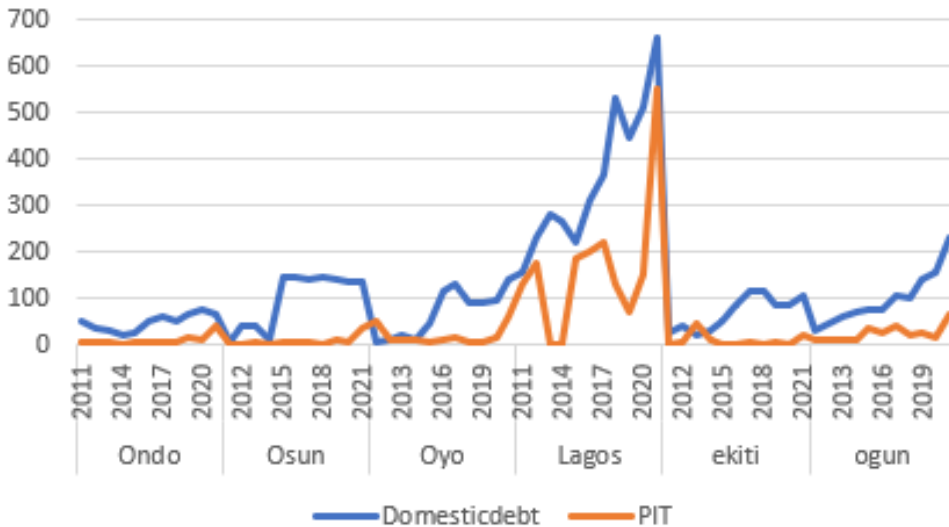
$$Y_{it} = \beta X_{it} + \alpha_i + u_{it} \quad 4$$

$$DEBTSERV_{it} = \beta_0 + \beta_1 PAYE_{it} + \beta_2 DIRECTASS_{it} + \beta_3 ROADTAX_{it} + \beta_4 MDSAREV_{it} + \beta_5 OTHERTAX_{it} + \dots + y_2 E_2 + \dots + y_n E_n + u_{it} \quad 5$$

$$DEBTSERV_{it} = \beta_0 + \beta_1 PAYE_{it} + \beta_2 DIRECTASS_{it} + \beta_3 ROADTAX_{it} + \beta_4 MDSAREV_{it} + \beta_5 OTHERTAX_{it} + \dots + y_2 E_2 + \dots + y_n E_n + \delta_2 T_2 + \dots + \delta_t T_t u_{it} \quad 6$$

## Results and Discussion

Trend Analysis of Personal income Tax and Domestic Debts servicing in South Western States, Nigeria.



**Figure 1**  
Trend Analysis of Personal Income Tax and Domestic Debts Servicing South Western States, Nigeria

From Figure 1, it was discovered that in Ondo state that domestic debt servicing rose more than income realized on personal income tax until it reached 2021 when personal income tax a little bit slide higher than domestic debt servicing in Osun state between 2011 and 2014 which shows that all the personal income tax realization are exhausted in servicing domestic debts, but personal income tax realization is more higher and triple between 2014 to 2021 than domestic debt servicing on debts incurred in other to finance Osun state government activities. But in Oyo State, it was discovered that between 2011 and 2012 personal income tax is higher than domestic debt servicing until 2013 when personal income tax was overturned by domestic debt servicing till 2014, but in 2015, more

domestic debt servicing was incurred which is lowered than personal income tax until 2021.

In Lagos state, domestic debt servicing was higher than personal income tax return or income, this signifies that Lagos State employed more of their income realized from PIT to servicing domestic debt because they have the highest domestic debts and personal income tax returns or Income in Southwest. In Ekiti State it was noted that between 2011 and 2012, domestic debt servicing is higher than personal income tax realized until 2013 when personal income tax conquered domestic debt servicing. In 2014, personal income tax below domestic debt servicing till 2021 which means that majority of government expenditure in Ekiti States is financed with debt, and more PIT

income is expended on debts servicing. In Ogun state, between 2011 to 2020, the state recalled lower personal income tax which was preceded by domestic debt servicing. In conclusion, the government in the southwest servicing domestic debts more than what was realized from personal income tax. It was also discovered that all personal income tax was employed by the state government for domestic debt servicing in south western states, Nigeria.

**The Impact of Personal Income Tax on Domestic Debt Servicing**

This session explained the impact of personal income tax on domestic debt servicing. The results of correlation matrix, variance inflation factor, Pooled Regression, Robust Regression, Fixed-effects (within) Regression, and Random-effects Regression were explained in this session.

**Table 1**  
**Correlation Matrix**

	DEBT SERV	PAYE	DIRECT ASS	ROAD TAX	MDSA REV	OTHER TAX
DEBTSERV	1.0000					
PAYE	0.6824*	1.0000				
DIRECTASS	0.5432*	0.2821*	1.0000			
ROADTAX	0.5300*	0.2609*	0.9927*	1.0000		
MDSAREV	0.3628*	0.4750*	0.2719*	0.2875*	1.0000	
OTHERTAX	0.5809*	0.3870*	0.9726*	0.9753*	0.3747*	1.0000

**Source: Author’s Compilation (2024)**

To check multicollinearity status in all variables incorporated, correlation matrix invariably tested. It was learnt that DEBTSERV has a good connection with PAYE (0.6824). This demonstrates that multicollinearity is not discovered amid DEBTSERV and PAYE. DIRECTASS

significantly and cordially connected with DEBTSERV (0.5432). Also, ROADTAX, MDSAREV, and OTHERTAX had good connections with DEBTSERV (0.5300; 0.3628; and 0.5809 respectively). Therefore, this called for a VIF test for more confirmation.

**Table 2**  
**Variance Inflation Factor**

Variable	VIF	1/VIF
ROADTAX	850.58	0.001176
DIRECTASS	642.68	0.001556
OTHERTAX	48.36	0.020676
PAYE	2.96	0.338082
MDSAREV	1.44	0.696137
MEAN VIF	309.21	

**Source: Author’s Compilation (2024)**

VIF was ignited to test for the presence of multicollinearity as displayed in Table 2. It was concealed that all the incorporated variables with the exception of PAYE and MDSAREV experienced multicollinearity because of their VIF values below 10 (2.96

and 1.44 respectively). This outcome promulgated for Linear Regression to eliminate multicollinearity in ROADTAX, DIRECTASS and OTHERTAX.

**Table 3**  
**Effect of Personal Income Tax on Domestic Debt Servicing**

DEBTSERV	(1) Pooled Regression	(2) Robust Regression	(3) Fixed- effects Regression	(4) Random- effects GLS regression
PAYE	1.652*** (0.000)	1.652*** (0.001)	1.871*** (0.000)	1.652*** (0.000)
DIRECTASS	-0.400*** (0.000)	-0.400*** (0.021)	4.059*** (0.041)	-0.397*** (0.035)
ROADTAX	1.714 (0.708)	1.714 (0.744)	0.414 (0.993)	1.714 (0.706)
MDSAREV	-0.0231 (0.900)	-0.0231 (0.955)	0.279 (0.162)	-0.0214 (0.908)
OTHERTAX	-0.588 (0.504)	-0.588 (0.533)	-2.324* (0.097)	-0.591 (0.500)
_cons	74.92*** (0.000)	74.92*** (0.000)	78.79*** (0.000)	74.90*** (0.000)
<i>N</i>	66	66	66	66
<i>R</i> <sup>2</sup>	0.603	0.603	0.672	
adj. <i>R</i> <sup>2</sup>	0.570	0.570	0.574	

**Source: Author’s Compilation (2024)**

Table 3 showed a variety of analytical tools engaged to establish the impact of personal income tax on domestic debt servicing. Pooled regression was initially analyzed but rejected when there was heteroskedasticity which was exposed by VIF. Robust regression was carried out to eradicate the spurious results of pooled regression. According to Robust regression, a percentage increase in PAYE, DIRECTASS and ROADTAX invariably increase

DEBTSERV by 1.6%; 0.4%; and 1.7% respectively. While MDSAREV and OTHERTAX significantly reduced DEBTSERV by 0.02% and 0.5% respectively. Further, based on the nature of the data which is panel, random effect and fixed effect analysis were ignited which were shown in Table 3. But to correctly pick appropriate and vibrant models, the Hausman test was absolutely chosen for the acceptable judgment between the two

models as shown in Table 4. However, the fixed effect was absolutely chosen by the Hausman test. According to Fixed effect, a percentage increase in PAYE, DIRECTASS, ROADTAX, and MDSAREV invariably increase DEBTSERV by 1.87%; 4.05%;

0.41% and 0.27% respectively. But any increase OTHERTAX significantly downplay DEBTSERV by 2.3% respectively.

**Table 4**  
**Hausman Test**

PAT	(b) Fixed Effect	(B) Random Effect	(b-B) Difference	$\sqrt{\text{diag}(V_b - V_B)}$ S.E
PAYE	1.870864	1.652186	.2186775	.1818449
DIRECTASS	4.059233	-.3973203	4.456553	3.180961
ROADTAX	.0413882	1.713804	-1.302416	1.31492
MDSAREV	.2791185	-.021388	.3005065	.0692097
OTHERTAX	-2.323842	-.5907334	-1.733108	1.06098
$\text{Prob} > \chi^2 = 0.0104.$ (V <sub>b</sub> -V <sub>B</sub> is not positive definite)				
$\chi^2(5) = (b-B)'(V_b - V_B)^{-1}(b-B) = 15.00$				

Source: Author’s Compilation (2024)

The Hausman Test was employed to analyse judge between fixed effects and Random effects. It was discovered from Table 4 that  $\text{Prob} > \chi^2 = 0.0104$  which indicated that analytically random effect is rejected but favored fixed effect because  $\text{Prob} > \chi^2$  is not less than decision parameters 0.05 significant level. Therefore, fixed effect are considered better amid random effects and fixed effects models.

**Discussion of Findings**

This study examines the impact of PIT on domestic debt servicing in South Western states, Nigeria Data used to gauge the impact of PIT on domestic debt servicing were assembled from each state’s internal board of Revenue, CBN and FBS data from 2011 to 2023. Data gathered from all south western states were analyzed by Pearson correlation, VIF, and panel data analytical tools such as pooled regression, fixed effects and random effects estimations. Hausman

was further ignited to select a better model amid fixed effects and random effects estimations. Other tests such as autocorrelation test, VIF, and heteroskedasticity were also conducted. It was revealed that DEBTSERV has a good connections with PAYE (0.6824). This demonstrates that multicollinearity is not discovered amid DEBTSERV and PAYE. DIRECTASS significantly and cordially connected with DEBTSERV (0.5432). Also, ROADTAX, MDSAREV, and OTHERTAX had good connection with DEBTSERV (0.5300; 0.3628; and 0.5809 respectively). This finding is in line with the advocacy of Adebite & Mubarak (2018); Adebite & Ishola 2022; Alawneh 2017; Van et al. (2021), but rejected the submission of Ncanywa & Setati (2022); Okeke et al. (2022).

The study’s findings showed the absence of multicollinearity between domestic debt and pay as you earn. PAYE



was discovered to have a positive effect on domestic debts servicing. That is any upward income in PAYE upsurges debts servicing invariably. This displays that PAYE is one of the formidable instruments employed to reduce debts in south western states, Nigeria. This submission is in consonance with the views of Adegbite & Agboola (2019); Adegbite & Mubarak (2018); Haffner et al. (2017); and Mba et al. (2013), but overruled the submission of Ncanywa & Setati (2022); Okeke et al. (2022). It was also noted from the results that direct assessment possessed a cordial relationship with domestic debt servicing (0.5432), in the same vein, having a positive effect on domestic debts servicing. The higher is income realized from direct assessment, the higher is improvement in debts servicing in south western states, Nigeria. The outcome supported the views of Adama (2016); El-Yaqub et al. (2024); Haffner et al. (2017); Mba et al. (2013); and Okeke et al. (2022) but disagreed with the views of Adegbite & Mubarak (2018); Babu et al. (2015); Elom-obed et al. (2017); and Haffner et al. (2017).

Road tax has a significant positive influence on domestic debt servicing. This confirmed that road tax is also effective in reducing the debt burdens in the states in south west Nigeria. This dispensed that road tax increment invariably increases the potency of the government in financing domestic debts in the states studied. The result concurred with the discovery of El-Yaqub et al. (2024); Haffner et al. (2017); Mba et al. (2013); and Okeke et al. (2022) but not in line with Adegbite & Shittu (2018); Adegbite & Agboola (2019); Elom-obed et al. (2017); and Okeke et al. (2022). In the same vein, MDSAREV impacted domestic debts positively in South Western states, Nigeria. This shows that income realized from MDAs in South Western states is insignificant to domestic debts servicing. It was shown further that all the financial income influxes in MDAs is ineffective, inefficient and unproductive to downplaying debts in south western states, Nigeria. In the

same vein, income realized from other taxes are impotent to bring down debts' weights in the states. This is supported with the findings that OTHERTAX has a negative effect on domestic debts servicing in south western states, Nigeria. The outcome further supported the submission of Mba et al. (2013); Ogboghro (2023); and Van et al. (2021), but against the submission of Babu et al. (2015); Elom-obed et al. (2017); Haffner et al. (2017); and Okeke et al. (2022).

## **Conclusion and Recommendation**

This study examined the impact of PIT on domestic debt servicing in South Western states, Nigeria Data used to gauge the impact of PIT on domestic debt servicing were assembled from each state's internal board of Revenue, CBN and FBS data from 2011 to 2023. Data gathered from all south western states were analyzed by Pearson correlation, VIF, and panel data analytical tools such as pooled regression, fixed effects and random effects estimations. Hausman was further ignited to select a better model amid fixed effects and random effects estimations. Other tests such as autocorrelation test, VIF, and heteroscedasticity were also conducted. The study findings showed the absence of multicollinearity between domestic debt and pay as you earn. It was also discovered that direct assessment and road tax also possessed cordial relationships with domestic debt. Also, MDSAREV with correlation matrix value also possessed a positive relationship with domestic debt as it shows that there is an element of multicollinearity between MDSAREV and domestic debt.

Furthermore, it was revealed that personal income tax policies have a significant impact on the choice of domestic debt servicing instruments. Findings indicate that the impact of personal income tax on domestic debt servicing varies within South Western Nigeria. Conclusively, positive

correlation was established between personal income tax revenue and domestic debt servicing in South Western Nigeria. Also, PIT has positive, significant and statistical impact on domestic debt servicing in South Western Nigeria. When personal income tax collections increase, the government tends to rely less on domestic debt to finance its activities. That is, personal income tax remains a vital revenue source for the state, contributing significantly to the government's fiscal capacity. Personal income tax mitigates the need for excessive domestic debt servicing, it is essential to monitor debt management closely. Over reliance on domestic debt can lead to higher debt servicing costs and fiscal challenges in the long term. The findings important policy implications is that policymakers should continue to refine tax policies to boost personal income tax collections while ensuring prudent debt management practices that are policies aimed at enhancing tax collection efficiency and compliance can lead to increased revenue and potentially reduced debt reliance.

This balanced approach can contribute to fiscal sustainability and domestic debt servicing in South-Western Nigeria. It is further recommended that the government should strengthen tax enforcement mechanisms to display proper accountability and transparency measures so that revenue realized from PIT will be enormously enough to emaciate domestic debt significantly in south western Nigeria. Government should also lessen domestic borrowings but activate unexploited taxes embedded in PIT, and curtail corruption in borrowed funds for effective usage in the country.

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