

## TAXES AND INFRASTRUCTURAL DEVELOPMENTS IN EDO STATE

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### ABSTRACT

*Taxes are potent instruments for development. State governments however have limited space for tax revenue collections in the face of mounting and emerging functions expected to be performed. Edo State government is one state that is agrarian and an emerging hub of economic activities and one of the few states where the National Insurance Health Scheme and investments in health have occurred. What resources are in the hands of the government to address all of these? This study examined the taxes collected by the Edo State government and their impact on the Infrastructural Development Revenue Service (EIRS). To achieve this objective, the longitudinal research design was used. The data used were obtained from the Central Bank of Nigeria (CBN) and Edo State Internal Revenue Service. We employed the parsimonious Error Correction Model, after conducting a cointegration test, to ascertain the short-run and long-term term-dynamics of the data. Findings revealed that Capital Gains Tax on Individuals (CGTi) and Stamp Duty on Individuals (STDi) had a positive relationship with and significant impact on Infrastructural Development (IFR). In contrast, Value Added Tax (VAT) and Personal Income Tax (PIT) were negative but significant in their impact on Infrastructural Development (IFR). The study concludes that taxes used have a significant role in infrastructural development. The study recommends that the taxpayers should, via incentives and moral persuasion from the government continually pay their taxes, while the government utilizes proceeds of tax for good governance.*

**Keywords:** Taxes, Infrastructural Developments, Edo State, Nigeria

**JEL Classification:** H51, 52, 53

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### 1.0 INTRODUCTION

Infrastructure is a significant component of a country's development prospect. The adequacy of it may determine a country's success in its effort to improve the welfare of citizens. Tax revenue is a core component of infrastructural development and the provision of infrastructural services is one of the major roles of any government especially at the sub-national level where the dividends of governance are much closer to the people.

Therefore, the role of taxes in the provision of infrastructure cannot be overemphasized as the infrastructure of any state is directly related to the quality of life. In the statistics of the National Bureau of Statistics (NBS, 2022), most Nigerians are multi-dimensionally poor, a development that suggests a low-quality life for most Nigerians. No nation develops without infrastructural developments, and studies have shown that the state of the infrastructure in the State indicates that not much support has helped the State to drive industrial development. Against this background, Edo State Administration Law (ESRL, 2012) enacted a law expected to boost the revenue and make the Edo State Revenue Service not only autonomous but anchored on strict professionalism, transparency, and integrity. The intent is to enhance the revenue profile of the State. As a consequence of the enactment, a Tax Assessment Review Committee (TARC) was birthed. About 12 years down the lane, there seems a gradual surging rise of increased projects in the State. In education (such as Edobest), and in industry (with the establishment of the Edo Modular and Refinery Ltd., Ossiomo Power Plant to light up Edo State and support the industrial take off, there has been steady progress. No doubt, some feats have also been achieved in the health, and agricultural sectors, with the enrolment of Edo citizens into the health insurance scheme, and provision of some road infrastructures, among others. Many have applauded the government for the feats achieved and argued that the increased revenues to the government, outside the Federal allocation, are responsible for the developmental projects. Other concerned citizens have, however, argued that there are projects that have failed to get the attention of the State government, such as the 30 billion naira ‘Benin Water-Storm’ Project which many have regarded as a fraud despite the huge finances that have been received from the pool of tax revenue.

A preponderance of studies in the literature appears to evaluate the impact of federal taxes on developments, including infrastructure (Ibadin & Oluwatuyi, 2021; Ayeni & Afolabi, 2020). with limited studies involved in the evaluation of states’ taxes (Samuel & Tyokoso, 2014). Others tended towards the examination of each of the taxes and infrastructural development (Okoror et al. (2019). Yet others only evaluated anecdotally and without appealing to data tax fraud (Ibadin & Kemebradikemor, 2020). Barring any leakages, however, we recognize the humungous amounts of tax revenues realized from the states’ internal revenue sources. This study fills this gap occasioned by the paucity of “works” done in this area, using Edo State as the focus. Recognizing that Edo State is endowed with revenue sources potentials, with a population of about 3.5 million people, a Gross Domestic Product of 3.99 trillion naira as of 2024 (simpleblogshare.com, 2024), and about 45 billion naira in 2022 (Edo State Internal

Revenue Service, 2024). Therefore, it became expedient to conduct a study to evaluate the impact of these resources on the State infrastructure with focus on the use of the State taxes or internally generated taxes for some defined infrastructures in Edo State, The taxes of interest are the capital gain tax collected by the State, the personal income tax, the value-added tax received by the State from its share from the Federation, the stamp duties and the withholding tax collected by the State. These taxes were chosen and used in this study because the focus was on these taxes as against the State-owned federally collected taxes claimed to be barely enough to develop the yearning infrastructures.

## **2.0 PRIOR INVESTIGATIONS**

Generally, taxes and infrastructural developments have been connected in some anecdotal- and empirical-related reviews. The connections reflect the relationships and impacts taxes have exerted on infrastructural developments in the geographical spheres of the entity. Edo State and its state of infrastructures may also determine the contribution and the commitment of the State's tax revenue to it, hence the brief review of the geography of the State

### **2.1 The Geography of Edo State**

Edo State is a state located in the South-South geopolitical zone of Nigeria. As of 2006, given the national population census, the State was ranked as the 24th most populated state, with 3,218,332 residents in Nigeria (The Nigerian Finder, 2009). The State population figures were projected to be about 8,000,000 in 2022. In 2016, Edo State had a land area of 17,802 square kilometres. Edo State is a diverse state that is predominantly inhabited by the Edoid people, including the Edo (or Bini), Esan, Owan and Afemai people. The most common Edoid language spoken revolves around these Edoid people, the Bini, Esan and Afemai languages. Strictly speaking, the Edoid people are homogenous. Christianity is the dominant religion in Edo State. The religion was first introduced to the region by Portuguese missionaries during the 15th century. However, Islam and traditional religions are also practised. Though the State is mainly agrarian, supplanted by oil exploration activities, the state government leverages the taxation potentials to provide infrastructures to the people.

### **Infrastructural Developments- Contexts**

Infrastructural developments describe the main parts of the economic, social or any other transformation that supports productive and expansive operations. The transformation occurs by way of progress. The development of a state's infrastructure is vital to the growth and development of that state. Infrastructural development accounts for the improvement of the

quality of the various components of infrastructures intended to bring about the intended growth and progress in the economy of the State, and basically essential for development to take place (Ayanduba & Aronmwan, 2015).

Infrastructural developments represent the construction improvement and maintenance of physical infrastructure. The infrastructural development process captures the processes of identifying the right project to be executed, drawing up the feasibility and viability studies and carrying out the physical development of the project. It is a complex process that involves planning, financing, designing, and executing infrastructure projects to meet the needs of the community and enhance economic, social and environmental well-being.

State governments in Nigeria, generate basic taxes and other revenue sources to provide proper infrastructural growth and development. Of these facilities, primary health care services, level of agricultural development, and access to proper education stand out. This is because the human development index has the components of health, living standard (partly measured by the level of investment in agriculture), and education;

- **Primary Health Care (PHC) and Secondary Health Care (SHC) Facilities:**

PHC is typically a person's first contact with the health system and broadly encompasses care that is not related to a hospital visit. It includes a range of activities, such as health promotion, prevention, early intervention, and treatment of acute conditions. PHC ensures that people receive comprehensive care, ranging from promotion and prevention to treatment, rehabilitation, and palliative care. PHC addresses the majority of a person's health needs throughout their lifetime. It is a grassroots management approach to providing health care services to communities.

The role of state governments in the provision of health care is critical and essential in the provision of quality health services. This can be achieved by building and maintenance of infrastructure, training and retraining the workforce and providing materials and equipment for effective health care (Aigiremolen et al., 2014).

In his analysis, Abdullahi (2023) chronicled the road map of Edo State to providing accessible health care, at both PHC and SHC, which is positively impacting the lives of those who were previously sidelined, marginalized, and underserved through the Edo State Primary Health Care Development Agency (ESPHCDA). The ESPHCDA is responsible for strengthening the foundation of the State Primary Care system by increasing access to effective, efficient and

sustainable healthcare services to Edo State Residents. To this end, The ESPHCDA has deployed qualified healthcare workers to several health centers, ensuring that residents in rural areas have access to premium healthcare services across the state. To this end, the government of Edo State has been investing copiously in building the capacity of its healthcare workers, a remarkable feat worthy of commendation. Recently, the State embarked on an ambitious plan to train over 300 Primary Health Care (PHC) personnel, both clinically and non-clinically, to enhance their skills and capabilities in delivering top-notch medical services. This is evident in the selection of 55 PHCs for a massive overhaul, a bold move that shows the government's determination to bring the state's healthcare infrastructure to international standards of excellence. This is closely followed by the hiring of over 700 medical professionals, who will work alongside the existing workforce to fortify the State's PHC infrastructure. A good number of general hospitals have received good attention in terms of medical equipment deliverables. The State Health Insurance Scheme has taken off in earnest. Besides, the Stella Obasanjo Women and Children Hospital and Edo Specialist Hospital have also been upgraded and equipped to provide enhanced secondary health care services in the State.

- **Agricultural Development Facilities:**

Agriculture is the bedrock of any economy especially in Africa (Adama et al., 2018). Major economies are built on their ability to explore their potentials and opportunities using natural resources, except in technologically developed countries, like Japan. Agriculture plays a vital role in the national development of the most developed economies. Edo State has made a significant leap into the development of agriculture through many initiatives. For instance, in 2014, the Edo Government acquired 410,000 hectares of land in the State, for investments in agriculture by the private sector. Out of this land, 50,000 hectares of the land were set aside for the cultivation of rice by the Dangote Group, while 60,000 hectares were acquired for the cultivation of oil palm by the United Food Industries Limited, makers of Indomie noodles. The remaining 300,000 hectares had been kept for other investors interested in farming activities. Also, the land was allocated to youths interested in agricultural activities and measures have been put in place to ensure proper use of such land. Other agro-development efforts have long followed. For instance, the Edo State Government through the Edo State Farmers' Cooperative Agency, Edo Agropreneurs Programme (EAP) utilized 4,400 hectares of land across the 18 Local Government Areas of the State for agricultural-related activities in the State. To enhance the judicious use of its land, the Edo State Lands Administration and Geographic Information Service Law, 2018 was enacted. Through the law, the State Government established the Edo

State Geographic Information Service to, among others; enhance land use, management, and administration in the State.

- **Educational Facilities:**

Education in human welfare and social progress is indisputable. Unfortunately, the government at the federal level has not shown enough commitment, given the low level of investment in Education; it is barely up to 10% of the yearly budget (N1.09 trillion as against the total budget of N21.83 trillion- about 4.9%- for 2023 and education budget of N1.18 trillion as against the total budget of N17.12 trillion in 2022, about 7.2%. These statistics are against the United Nations Educational, Scientific and Cultural Organization (UNESCO) minimum percentage of 25% of every country's annual budget. However, in Edo State, the government has shown some commitment at the levels of primary and secondary.

Today, as it has been acknowledged, human capital development has an enormous impact on the long-term growth of any society. Therefore, any national or regional government that cannot efficiently raise tax revenues cannot improve their productive spending in higher education. It is in this recognition the Edo State government's budgetary allocations to the education sector hover around 12% (2023 total budget was about N320 billion as against about N214 billion in 2022 with N214.6 billion budgeted for education, translating to 11.4%). The education sector in Edo State, appears favoured by the government with a good number of primary and secondary schools purportedly receiving attention. To this end, resources have been channelled into reducing educational infrastructural deficits through the rebuilding of schools, and the latter may rise or fall over time depending on the fiscal operations of the government.

## **2.2 An Overview of Taxation**

Generally, in Nigeria, taxation preceded the coming of the colonialists (Samuel & Tyokoso, 2014). The oldest tax was the community tax in Northern Nigeria in 1904 (Odusola, 2006). All forms of taxes were streamlined through the Native Revenue Ordinances to the Western and Eastern Regions in 1917 with subsequent reforms. Today, the Federal Inland Revenue Service (FIRS) for the federation, the State Board of Internal Revenue for the State, and the Local Government Revenue Committee for the Local Government are respectively at the forefront of collecting nine (9) taxes, twenty-five (25) taxes, and twenty-one (21) taxes (Taxes and Levies Approved Collection List, 1998 as amended).

Taxation is primarily to raise revenue for government expenditures, but it serves other purposes as well. Using taxation, resources are simply transferred from individuals and organizations, for public sector governance and provision of economic and social infrastructures. Taxation can be on progressive, regressive and proportionate rates; it can also be direct and Indirect, depending on the incidence of the burden: the burden of direct tax is felt directly by the taxpayer and the indirect burden falls on the ultimate consumer of the product or service purchased.

In Edo State, various taxes are collected by the State government as spelt out by the Taxes and Levies, Approved List (1998), amongst which are Capital Gains Taxes on individuals, Personal Income Taxes, and Stamp Duties on individuals, all of these are ranked as common taxes collected by the States.

- **Capital Gains Taxes (CGT) on individuals (CGTi):**

The CGT was introduced in 1967 and came into effect in 1967/68 (Osho et al., 2019). It is governed by the Capital Gains Tax Act, Cap C1 LFN (CGT, 2004) as amended. This tax is administered on all registered companies and individuals in Nigeria which earn capital gains realized on the disposal of any form of assets owned by individuals in Nigeria. The current rate of capital gains tax is charged at a flat rate of 10% on chargeable gains (FIRS, 2020; Finance Act, 2019 as amended). The capital gains tax is calculated and filed with the company's income tax to the FIRS and individuals with the personal income tax to the relevant state board of internal revenue (SBIR).

One of the ways to mitigate capital gain tax is the rollover relief. Rollover relief is available to any company that has sold its business assets and used the whole proceeds to acquire the asset of the same class. This rollover relief can either be full or partial.

- **Personal Income Taxes (PIT):**

This is the oldest tax in the country (Odusola, 2006). Currently, in Nigeria, PIT is established and administered by the Personal Income Tax Act Cap P8 LFN,2004 (PITA,2004) as amended by the Personal Income Tax Act PITA (2011). PITA (2004) imposes income tax on individuals, communities, families executors and trustees, and provides for the assessment and collection, and administration of the tax. PIT in Nigeria is charged on the income of individuals as Pay-As-You Earn (PAYE) or self-assessment. Individuals in employment are taxed, using the Pay-As-You-Earn (PAYE) system. In PAYE, the employer is treated as an unpaid agent of the Tax

Authority under the scheme and is expected to withhold taxes on salaries, wages, bonuses, allowances, and in-kind benefits.

Overall, the PIT is a progressive tax that is levied as income increases and one of the most fundamental sources of government revenue from the viewpoint of certainty and consistency for taxpayers. It is administered by the FIRS and SBIR, depending on the type of individual and their residence. The SBIR is required to collect all PITs of individuals, excluding foreign officers, members of the police and armed forces as well as non-residents in Nigeria and residents of the Federal Capital Territory of Abuja (PIT,2004).

Given the progressive nature of the PIT., and the PITA (2011), the first #300,000 and next #300,000 of the total emolument of eligible taxpayers will be subjected to respective rates of 7% and 11%. This will be followed by 15% and 19% rates to be applied respectively on the next #500,000 and #500,000 of the same taxpayer's income. Given the same taxpayer under consideration, their next #1,600,000 and over #3,200,000 will suffer tax rates of 19% and 24% respectively.

- **Stamp Duties on Individuals (STDi):**

Stamp duties are duties imposed by an Act of Parliament on certain instruments which have legal effect (Abdulrazaq,2016); and they are charged on written and electronic instruments, otherwise referred to as documents for companies {section 4(1) of the Stamp Duties Act,2004 as amended} and State Government through the State Board of Internal Revenue for individuals{section 4(1) of the Stamp Duties Act,2004 as amended}. Stamp duty was first introduced to Nigeria via Ordinance 41 of 1939, but is currently codified as the Stamp Duties Act, Cap S8, LFN (Stamp Duties, 2004). The Stamp Duties Act provides that an instrument executed in Nigeria (or if executed elsewhere, relating to property in Nigeria) or any matter or thing to be done in Nigeria must be stamped to be admissible in evidence in civil proceedings in Nigeria.

While some documents attract stamp duties on a flat rate basis, these are assessed individually. Stamp duty is charged either at an ad valorem rate (according to value) or at a fixed amount, thus implying that ad valorem duties are charged at fixed percentages of the value of the consideration of the transaction to which the document relates. On the other hand, duties of fixed amounts do not vary regardless of the consideration. Examples of documents charged at ad valorem rates include mortgages, debentures, and leases; while instruments charged at fixed amounts include but are not restricted to contracts, voting papers, and receipts



It must be noted that the Federal Government is the only authority that imposes, charges and collects duties upon the instruments specified in the schedule if such instruments relate to matters between companies and individuals. In a somewhat similar stride, the State Government is saddled with the responsibility to collect duties in respect of instruments executed between persons (or individuals) at such rates as agreed with the Federal Government {Section 4(2) of the Stamp Duties Act,2004}. Although stamp duties are regulated by federal law, their administration is a mutual operation. While the federal government is responsible for the administration of the tax on companies through FIRS, the State Board of Internal Revenue (SBIR) handles its administration of individuals. One of the problems facing the stamp tax is the trespassing of federal agents who also tax individuals as opposed to companies only.

Stamp duties are usually managed by the Commissioner of Stamp Duties.

- **Value Added Tax (VAT):**

The administration and management of VAT assessment and collection in Nigeria have only been under the control of the Federal Inland Revenue Service (FIRS). VAT is a consumption tax (Ayanduba & Aronmwan, 2015) that is paid on all imported and locally delivered products and services in Nigeria. Individuals, businesses, and governmental organizations are all responsible for paying VAT, which is assessed at a rate of 7.5% at the moment (Finance Act,2021). VAT is not applied to several goods and services, including exports, basic food items, books and educational materials, medical and pharmaceutical products, and medical services. However, the FIRS is given authority to manage the collection of VAT from taxable persons in Nigeria {Value Added Tax (VAT,2004)}.

VAT is usually shared amongst all arms of government in Nigeria for the Federal government (15%), State government (50%) and Local government (35%) {Value Added Tax Act V4 LFN 2004 as amended}. With the amendment of the Finance Act to 2019, VAT has increased from 5% to 7.5% (Finance Act,2021). Businesses are expected to register for VAT within the first six months of opening their business {section 8 (1) of the VAT, 2004}. Businesses are expected to provide proof of their VAT registration and prior remittance to conduct business with state, federal, or local government entities. The registered person or VAT agent is required to submit routine VAT returns 14 days following the month when the transaction occurs (Finance Act, 2023 and KPMG Tax Alert, 2023).

### **2.3 Theoretical Framework**

The benefit received theory of taxation throws light on taxes and infrastructural development. The theory, propounded by Erik Lindahl. in 1919, states that citizens tend to pay more taxes often and with convenience when they feel they receive benefits from the activities of the state. In clearer words, people are motivated to pay taxes when they perceive that the taxes they pay to the government are used for their benefit in the form of building infrastructures and promoting economic growth (Ayeni & Afolabi, 2020). In simple terms, taxpayers expect benefits from the taxes paid to the government in the form of providing different infrastructures as well.

## **2.4 Empirical Reviews**

Empirically, studies have examined the relationship between the various specific taxes used for infrastructural developments. The relationship or the impact can be seen in Edo state in Nigeria. Osho et al. (2019) evaluated the impact of capital gains tax (CGT) on investment (INV), the provision of infrastructural facilities (IFP), and gross domestic products (GDP) in Nigeria. Data were gathered and put through some diagnostic tests, including the Augmented Dickey Fuller (ADF) Unit Root test to determine stationarity of variables and the Johenson Co-integration trace and Eigenvalue test to demonstrate the long-term relationship of variables. According to research, Nigeria's infrastructure and investment have a good association and a considerable impact on capital gains tax. It is advised that the government make sure that the capital gains tax is correctly applied, effectively managed, and accounted for, to enable the citizenry reap the benefits it confers on investments, Infrastructural facilities provision and gross domestic products in Nigeria

In another study, Olugbade and Adegbie (2020) conducted a study on the contribution of personal income tax (PIT) to the provision of infrastructural development in Lagos State. The study covered twenty-two (22) years covering 1997 through 2018. Findings revealed a causal relationship between PIT and infrastructural development in Lagos State over the period. The study recommends that the government should diversify its revenue collections and explore personal income tax collection. This study is in tune with Adeyemi and Mieseigha (2019) who carried out a similar study, using Nigeria.

Okwara and Okoro (2021) researched the effect of stamp duty, revenue generation on economic growth in Nigeria. To this end, time series data were used covering 2000 through 2018. Using Ordinary Least Square regression analysis, the finding revealed that revenue generated from stamp duty does not have a significant impact on total federal revenue collected in Nigeria.

Besides, stamp duties are found to have a significant impact on economic growth in Nigeria. On this basis, it is recommended that the Government take necessary steps to address the problem of corruption and mismanagement of all proceeds from stamp duties, and those measures should be taken to check all loopholes and leakages that will reduce revenue generation from stamp duty because of the significant impact on economic growth

Okoror et al. (2019) examined value-added tax and infrastructural development in Nigeria. This study adopted an ex post facto research design with secondary data collected from 1994 through 2017. The study employed an autoregressive distributed lag approach to co-integration. Findings revealed that VAT is generally not characterized by oscillations year-on-year over the period. This was found to be good and traced to the efficiency and monitoring levels of tax management. The study recommends that the government and tax authorities should consider the VAT- consumption-based models to ensure revenue stability

In the preceding reviews, it is demonstrated why some researchers as indicated against their reviews focused on federally collected taxes, while others took up the examination of state-collected taxes. Yet, some examined, though, anecdotally, the nexus of taxes and infrastructural developments. The crux of all of these reviews speak to the limitedness of studies at state governments levels. Be that as it were, and to the best of our knowledge, no clear-cut studies on all the Edo State-collectable taxes and infrastructural developments have been examined. This is where this study filled the gap.

### **3.0 METHODOLOGY**

Time series data for 30 years were employed. The longitudinal research design was used. The taxes evaluated included such taxes collected by the State, including Capital Gain Tax on Individuals (CGTi), Personal Income Tax (PITi), Stamp Duties on Individuals (SDUi), and Value Added Tax as shared to the State (VATs). Infrastructural developments used included total expenditures in health, agriculture and education for 30 years between 1990-2020. This huge length of time was intended to provide room to observe trends and seasonality over the years or in each year.

#### **3.1 Sources of Data**

Secondary sources were used and they were the Edo State Internal Revenue Service (EIRS) and the Central Bank of Nigeria (CBN) where necessary.

#### **3.2 Model Specification**

The model used and expressed as a functional model, is:



#### 4. RESULTS AND DISCUSSIONS

Table 2: Descriptive Statistics

Statistics Names	IFR	CGTi	STDi	VAT	PIT
Mean (N'Tr)	1.039992	0.428164	0.723107	0.593732	7.769452
Median (N'Tr)	1.030895	0.180524	0.728973	0.656240	6.904716
Maximum (N'Tr)	1.147856	0.829690	0.736243	0.759700	10.16549
Minimum (N'Tr)	0.982902	0.119424	0.677714	0.398361	3.840949
Std. Dev. (N'Tr)	0.046151	0.328644	0.015925	0.139538	2.113874
Skewness	0.897931	0.370203	-1.859088	-0.355953	-0.276599
Kurtosis	2.761289	1.148467	5.274679	1.366849	2.035208
Jarque-Bera	3.692369	4.473421	21.37387	3.570741	1.391457
Probability	0.157838	0.106809	0.000023	0.167735	0.498711

Source: Researchers' Compilation, 2024

Table 2 shows that the mean value for IFR stood at 1.039 trillion. The standard deviation measuring the spread of the distribution stood at 0.04 trillion (four hundred million naira). The CGTi had a mean value of .4282 trillion naira (four hundred and twenty-eight billion two hundred million naira) with a standard deviation value of .328 trillion (three hundred and twenty-eight billion two hundred naira), indicating that the variable is well spread. STDi had a mean of 0.723107 trillion (about seven hundred and twenty-three billion) with a standard deviation of about fifteen billion naira (0.015925 trillion). VAT collected by the State and PIT both respectively had the means of 0.593732 trillion and 7.769452, trillion with standard deviations of respectively 0.139538 trillion and 2.113874 trillion. The personal income tax collected on average during the period amounted to over seven trillion, a development that was possible, partly because of the implementation of the Personal Income Tax of 2004 as amended in 2011. The Edo State Government to date has had an unfettered implementation of this Act, leading to a lot of revenue from personal income tax

#### Unit Root Test

In time series data involving taxes and infrastructural development, a unit root test detects if the data has a stochastic trend (non-stationarity). If present, it suggests that tax revenues or infrastructural development expenses have a permanent impact, informing forecasting models and policy decisions to ensure sustainable economic growth.

Acknowledging the non-stationarity of 30 years of the data used, a unit root test was conducted, first at their levels and then at the first difference in Table 3

Table 3: Unit root Test

Variables	ADF	Crit val	Remark	Variables	ADF	Crit val	Rem
@ Levels				@ First difference			
IFR	0.54	-2.97	Non-state	D(FCR,2)	-7.1	-2.97	stationary
PIT	-1.49	-2.96	Non-statio	DCIT,2)	-3	-2.96	stationary
STDi	6.78	-2.986	Non-statio	D(VAT,2)	-6.1o	-2.986	Stationary
VAT	1.12	-2.981	Non-statio	D(CED,2)	-7.455	-2.981	Stationary
CGTi	-0.727	-2.963	Non-statio		-5.141	-2.963	Stationary
ECM	-3.78						

Source: Eviews 8.0

Using the Augmented Dickey-Fuller statistical test, the results are presented in Table 3. From the result of the unit root test carried out on each of the variables in the model to ascertain their level of stationarity, it is observed that all the variables are stationary at first difference concerning their critical values (tabulated) and P-value (as calculated), given that the p-values are less than the critical values as shown in Table 3. This therefore indicates that two or more cointegrating equations may exist in the model. We employed the Johansen cointegration in Table 4

### Cointegration

With the stationarity of the variables, we also undertook to conduct a cointegration test as we recognize that stationary variables can still be spurious or coincidental. If the variables are cointegrated, we can be confident to state that the variables share a common stochastic trend and that a causality relationship exists between them, hence the test in Table 4.

Table 4: Co-Integration Test

Dependent	tau-statistic	Prob.*	z-statistic	Prob.*
IFR	-3.871188	0.2622	-20.78	0.1852
CGTi	-2.321111	0.8776	-9.2556	0.8876
STDi	-3.180394	0.5431	-12.751	0.6906
VAT	-5.293014	0.0287	-27.37	0.0257
PIT	-2.67587	0.7619	-11.62	0.7638

Source: Eviews, 8.0

From the cointegration result presented in Table 4, it is observed that both maximum eigenvalue and trace statistics indicate the variables are co-integrated when measured at 5%. This implies the presence of a long-run relationship among variables.

### Parsimonious Error Correction Model (PECM)

The parsimonious error correction model (PECM) is employed for the cointegrated variables because it models the dynamic relationship between the variables.

The PECM simplifies the ECM by reducing the number of lagged terms. This makes it easier to estimate and interpret while still capturing the long-term relationship between the variables.

Table 5: Regression Result: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DCGTi	0.054167	0.026399	2.05188	0.055
DSTDi	1.497611	0.222568	6.728764	0
DVAT	-0.150619	0.034552	-4.35919	0.0004
DPIT	-0.005444	0.001821	-2.98868	0.0079
ECM(-1)	-0.503468	0.142888	-3.5235	0.0024
C	0.06524	0.150984	0.432103	0.6708
R-squared	0.722668	Mean dependent var		1.044473
Adj R-sqd	0.630224	S.D. dependent var		0.044999
S.E.	0.027364	Akaike info criteri		-4.127711
Sum sqd resi	0.013478	Schwarz criterion		-3.786426
Log likeld	58.59639	Hannan-Quinn crite.		-4.033053
F-statistic	7.817361	Durbin-Watson stat		2.154696
Prob(F-stati)	0.000301	Wald F-statistic		41.94863
Prob(Wald F)	0			

Source: Eviews, 8.0

Table 5 is the summary of the analysis carried out to ascertain the impact of taxes on infrastructural development in Edo State. From Table 5, it was observed that Capital Gain Tax

on Individuals (CGTi) was found to have a positive impact on Infrastructural Development in Edo State as revealed by the positive coefficient value of 0.055. It was also found to be statistically significant when tested at a 5% level of significance. Stamp Duties on Individuals (STDi), as a variable was found to have a positive relationship with a significant impact on Infrastructural Development in Edo State at the 5% level of significance. Value Added Tax collected by the Edo State (VAT) during the period under consideration was found to have a negative relationship but with a significant impact on Infrastructural Development at a 5% level of significance. Personal Income Tax was found to have a negative impact on Infrastructural Development in Edo state. It was also found to be statistically significant when tested at a 5% level of significance.

An examination of the Error term depicted as ECM with a one-period lag was found to have a negative coefficient value of 0.50 with an associated probability value of 0.00 respectively. From this result, it could be observed that the error correction model with one period lag denoted as ECM (-1) gives a pure indication of the ability of the model to adjust from disequilibrium to equilibrium in a given period. It therefore indicates that the system corrects its previous period of dis-equilibrium at a speed of 50% annually.

Furthermore, an examination of the summary statistics revealed that the coefficient of multiple determination depicted as  $R^2$  was found to have a value of 0.72 therefore indicating that the model accounts for 72% of the systematic variation exhibited by the dependent variable, while the remaining 28% is left unaccounted for and captured by other variables that are represented by the stochastic error term. The adjusted  $R^2$  which is adjusted for the degree of freedom for the successive inclusion of all other variables in the model stood at a value of 0.63. The F-statistics which measures the overall significance of the model stood at a value of 7.81 with an associated probability value of 0.00 therefore indicating that the model is jointly statistically significant at a 5% level of significance. The Durbin-Watson statistics which measure autocorrelation stood at a value of 2.1. This therefore indicates the absence of autocorrelation in the model.

Given the result on Capital Gain Tax and Infrastructural Development, this finding aligns with Osho et al. (2019), confirming that capital gain tax is not statistically significant as in Kumai's (2020) study. The non-statistical significance may not be unconnected with a range of factors, including, the timing and nature of infrastructural projects in the State, the non-similarity of the sample size and methodology used or any other factors that may also have accounted for



the non-statistical significance. On Stamp Duties, this variable was found to have a positive relationship with and a significant effect on Infrastructural Development, suggesting that stamp duties help to grow infrastructural developments. This finding is in line with Okwara and Okoro (2021).

Value Added Tax and Infrastructural Development had a negative relationship with and a significant effect on Infrastructural Development. This implies that the higher the value-added tax the lower the infrastructural development of the State. While this finding is a flash point, considering the apriori expectation based on the literature that the relationship is positive, this finding may have resulted from all or any of the poor governance and corruption from the use of value-added tax (VAT) in the State, inadequate planning and poor prioritization of the use of VAT on infrastructural development, dependence of other sources to fund infrastructural developments, among others. This finding disagrees with Oyedokun (2019) who found a positive relationship with and a significant effect on infrastructural development, among others.

Finally, Personal Income Tax was found to have a negative relationship with and a significant effect on Infrastructural Development. This suggests that increased personal income tax revenue leads to reduced infrastructural development. This reason could be traced to several factors, including restrictions and prioritization in the use of personal income tax revenue. All the same, this finding is in tandem with Olugbade & Adegbie (2020).

## **5. CONCLUSION AND RECOMMENDATIONS**

This study was carried out to ascertain the impact of taxes and infrastructural development in Edo state. In achieving this objective, data were collected from the CBN statistical bulletin and Edo State Internal Revenue Service. Variables studied were stamp duties on individuals, value-added tax collected by the State, capital gains tax on individuals and personal income tax collected by the State. The dependent variable was total expenditures on health facilities, agricultural facilities and educational facilities for 30 years. The parsimonious Error Correction Model was used after establishing the long-term and short-term dynamics of the variables. Findings showed that capital gains tax and stamp duties were found to be positive and significant. In contrast, personal income tax and value-added tax were found to be negative and statistically significant. The study concludes that taxes used affect infrastructural development in Edo state.

On the preceding conclusion, we recommend that capital gains tax should be broadened to include other hitherto disposals that are not chargeable to capital gains tax; besides, awareness

should be created so that more of the revenue from this tax can accrue to the government. Capital gains from asset disposals have not been maximally explored in Edo state. Furthermore, It is also recommended that stamp duties on documents executed by individuals still are not captured by the State Internal Revenue Officers of the State. The independence granted to the Revenue Service should be fully implemented to help grow the infrastructural development of the State. More so, the State Government is advised to pay particular attention to value-added tax and personal income tax. VAT shared and collected by the State can be channelled to certain infrastructures. The same goes for the personal income tax which has raked a lot of resources into the coffers of the State. Appropriate punishment can be given for tax malpractices irrespective of whose ox is gored. The government can go *quid pro quo*, thereby channelling personal income tax revenues for infrastructural developments to sections of the economy that are seen to pay more.

For future research, it is suggested that future studies examine value-added tax and personal income tax on one hand, and have a much broader sample or employ other cointegration-based techniques to establish if the findings from those studies will be comparable with those of this study. Lastly, the time frame could be increased to cover a longer time with more variables that impinge directly on infrastructural development measurement for more robustness.

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