

Tax Structure Implications on Exchange Rate and Infrastructural Development in Nigeria

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Abstract

The study examined the relationship between tax structure and exchange rate, and capital expenditure using secondary data obtained from Central bank of Nigeria and Federal inland revenue annual bulletin for the period 1994 to 2022 using multiple regression and auto regressive distributive lag. Tax structure was divided into direct and indirect tax consisting of PPT, CIT and VAT while the dependent variable was proxied by exchange rate and capital expenditure. Unit root test for stationarity was conducted using Augmented Dickey Fuller and Kwiatkowski Phillips Schmidt Findings show that in the short run the coefficients of the tax structure variables passed the significance test at the 5 percent level indicating that tax revenues critically influence short run changes in capital expenditure. The coefficients of current PPT, current CIT and complete VAT are all positive, which show that all forms of taxes promote capital spending by government in Nigeria in the short run. Thus, increasing tax revenues will immediately deliver positive impacts on the budgetary provisions for capital spending in Nigeria. The study also found that capital expenditure improves exchange rate, the positive impact of tax revenues on short run capital expenditure confirms that taxes have significant indirect impact on short run macroeconomic performance in Nigeria. The long run results also report interesting outcomes The coefficients of the two direct tax components are significant at the 5 percent level, while that of VAT failed the test at the 5 percent level. This result shows that while PPT and CIT significantly influence capital expenditures in Nigeria, VAT has no significant impact. It also suggests that VAT does not exert indirect long run effects on macroeconomic performance through the capital expenditure channel. The coefficient of CIT is however negative, indicating that increasing CIT tends to reduce capital expenditures in Nigeria. On the other hand, the coefficient of PPT is positive which indicates that only PPT tends to directly improve capital expenditure or indirectly improve long run macroeconomic performance through the channel of capital expenditure in Nigeria. The coefficient of public debt failed the significance test in the long run estimates, while the coefficient of exchange rate is significant at the 5 percent level and also possesses a negative sign. This implies that in the long run, exchange rate depreciation tends to limit capital expenditures in Nigeria. In particular every one percent rise in CIT was found to be consistent with a 0.877 percent rise in VAT, while a percent rise in PPT is accompanied by an increase in CIT by 0.93

percentage point. The relationship was found to be strong in Nigeria and also suggests that tax revenue in Nigeria is linked. the study found that only direct taxes led to improvement in exchange rate in the long run. This implies that direct taxes may be more effective in maintaining macroeconomic stability in Nigeria than application of indirect taxes. increases in indirect taxes tend to produce external effects that do not fully guarantee improvements in macroeconomic in Nigeria. direct tax component only improves exchange rate. Indeed, it was found that CIT revenues essentially lead to reduction in capital expenditure in the long run in Nigeria. That both PPT and CIT have significant negative impacts on exchange rate in the long run in Nigeria, indicating only the direct component of the tax structure in Nigeria significantly enhances exchange rate performance in Nigeria over time, while the effect of indirect tax components is insignificant. That only PPT has a significant indirect or channeled impact on macroeconomic performance through the capital expenditure in Nigeria. We recommend that government should pursue policies and programs that would help ensure exchange rate stability and boost local production for both consumption and export. In addition, a holistic program of economic reforms is important to complement the exchange rate policy and stimulate economic growth

Keywords: Tax Structures, Petroleum Profit Tax, Corporate income Tax, Value Added Tax, Exchange Rate, Public debt, Capital Expenditure

1. Introduction

The debate on the strategies government should adopt in achieving economic stability was ignited centuries ago and has been exacerbated by the challenges bedeviling the modern-day economy of many countries. Some scholars in a proposition known as Richardson equivalence argued that government interventionist agenda is irrelevant to the economy while the Keynesian economist on the other hand support interventionist agenda and argue that interventions such as borrowing and fiscal policies help stabilize the economy. The neoclassical economist argue that forces of demand and supply is the unseen hand that guides economic activities and interventions in the economy is an anomaly. The Marxist contrastingly argue for a welfare state.

However Government all over the world is saddled with the responsibility of economic management which involves balancing revenue with expenditure; with the aim to achieve economic stability and growth, provision of infrastructures and welfare to citizens. As proposed by Richard Musgrave as progressive nations industrialize, the share of the public sector in the national economy grows continually. The expanding economic requirement and expenditure of the state involve social activities of the state, administrative and protective actions, and welfare functions These three prime functions of the state must be financed. The financing need of government can be achieved through internal revenue generation in the form of taxes, exploitation of mineral resources, foreign direct investments, grants, aids and borrowing. Tax is a major revenue source of internal generated funds for government and play a vital role in the economy at both the micro and macro level. Tax revenue is deployed by government to meet its obligations in providing amenities, infrastructures, goods and services, protection of lives and properties and defense of the country through the armed forces. Taxation can be used as a fiscal and monetary policy tool aimed at economic stability. Lee and Gordon (2005) argues that taxes can be used to make social progress and achieve economic growth. Tax

exemptions can be used to encourage growth of certain sectors of the economy or as bail out to epileptic firms . It can also be deployed to discourage certain products through imposition of heavier taxes. Protection of local industries can be achieved through tax by imposing high custom duties on foreign goods. Taxes can also be used for income redistribution; reduction of inequities or inequalities in wealth and income. As a fiscal policy, taxation can be pivotal in curtailing inflation through increase in tax rate to reduce disposable income, constrain demand or to encourage consumption and production through tax cuts and increase employment. The total expenditure of government consists of the components of capital and recurrent expenditure. Infrastructural development is achieved through capital expenditure of government. To achieve economic stability and enhance growth and increase performance of the economy, government adopts monetary and fiscal policies.

Nigeria is a mono-economy which relies on revenue from crude oil as a significant source of revenue. Despite its heavy reliance on oil, revenue is declining due to failure to meet its production quota, oil theft, vandalization, community restlessness occasioned by oil spillage and pollution, militancy and multinationals oil exploration firms exiting the country due to insecurity. At the economic front, the country is faced with high unemployment, galloping inflation, food shortages, poor agricultural output, high exchange rate when the local currency is converted to foreign currencies, declining balance of payment, poor capital inflow, low per capita income, high level of poverty, declining manufacturing capacity. Furthermore, endemic corruption has devastated the country's resources and the weakness and inability of institutions saddled with the responsibility to tackle the menace is a spanner on the wheel of progress. This in sum renders government revenue profile inadequate. Apart from crude oil, revenue from taxation is another major source of government revenue. Direct and indirect tax components form the tax structure in Nigeria. Recently, in an attempt to bridge the revenue gap government increased value added tax rate from five percent to 7.5 percent on goods and services. The debt profile of government increased at both the domestic level and international level with a huge debt burden over hang on government.

The inability of government to meet its financing need necessitates borrowing. Public debt serves a moderator of tax structure components on macroeconomic performance. Public debt is one of the approaches used in financing government projects, although many other financing methods exist. Prior studies indicate that leverage creates value. To enhance growth countries, borrow to invest and fund budget deficit although they are myriads of ways which deficit financing can be achieved. The advantage of debt is that it has tax advantage as interest rate is tax deductible and borrowed funds when properly invested yield profits and enhance value without creating economic instability, policies that distort economic incentives, or sizable adverse shocks. Growth therefore is likely to increase and allow for timely debt repayments. Keynesian theory supports borrowing when there is necessity to increase money supply and enhance infrastructural development to tackle economic distortions and instability. It is therefore obvious that public debt compliment tax and impact on macro-economic performance.

In Nigeria, manufacturers groan and find it difficult to import raw materials and equipment to produce goods and services. Many manufacturing companies have closed down because of lack of spare parts and raw materials. Importers of finished goods are increasingly finding it difficult to import and meet increasing demand for goods. This anomaly is driving up the prices of goods and services. The problem of manufacturers, importers and others is the high volatility in foreign exchange rate. Nigeria in its phases of development has developed and executed intricate policies that overtime impact on the exchange rate regime from fixed to the present flexible state. The currency is affected by the dynamic pattern of global trade exchanges, variation in institutions within the economy, structural changes impacting production of agricultural produce which was a major foreign exchange earner. The discovery of oil changed the Nigerian economy from the Agro-based economy to a mono economy dependent on oil. Production activities suffered during the oil boom era and the economy became import dependent creating trade imbalances, balance of payment problems and demand for foreign exchange exceeding supply leading to foreign exchange fluctuations. Thus, government in an attempt to tackle this malaise adopted policies such as structural adjustment program in the early eighties to adoption of various fiscal and monetary policies suggested by world bank and IMF. Borrowing and naira devaluation to meet conditionalities imposed by foreign financial institutions created economic shocks, inflation and unemployment, closure of industries, low-capacity utilization by manufacturing firms.

Many researches carried out on the nature of relationship between tax structure revenue and economic performance focus mainly on macro-economic performance measures such as real gross domestic product, human development index, GDP, inflation and unemployment. One central variable that is yet to be considered is how tax revenue impact exchange rate and infrastructural development. This creates the gap for this study. This study is aimed at determining the nature of relationship between tax revenue and exchange rate with public debt as a moderating variable using autoregressive distributive lag method.

2. Literature Review

2.1 Theoretical underpinning

2.1.1 Benefit theory of taxation

The benefit principle suggests that citizens benefiting more from government expenditure and spending should pay more or that tax payment should commensurate with government spending in the same proportion. Therefore, beneficiaries of services financed by the government are expected to pay more than non-beneficiaries, this principle is almost similar to pricing in private transactions. If this principle is applied it connotes that allocation of resources to projects by the government will follow the pattern of tax payments. The higher the cost of the project the higher the expected tax beneficiaries are expected to pay. In a country setting, citizens do not see the need to pay for public services or projects funded by the government. Aside from the fact that the provision of social amenities is what citizens should enjoy, citizens lack the urge or natural tendencies to pay for these services. In fact, in some countries, if citizens are required to pay more taxes for the public services they enjoy, some citizens would prefer to be cut off or

excluded from such services. Based on the above scenario, executing the benefit will be cumbersome.

Contrasting with the benefit principle is the perspective adopted by economists which holds the notion that an efficient tax system is a product of the nature of market economy operated by an entity at a specific time. They opined that an economic system driven by market forces should be without intervention by the tax system and should be driven by production, consumption and efficient allocation of resources. Therefore, taxation should be obliterated as economic decision-making processes are distorted by taxation. Instability is created in the economy as a consequence of unnecessary intervention by the tax system.

2.1.2 The socio-political theory

The socio-political theory by Adolph Wagner advocated that social and political objectives should be the deciding factors in choosing taxes. According to the theory welfare evolution in the state emanates from free market capitalism as the citizens of the state request for social services commensurate with revenue growth. Richard Mushgrove in extending the Wagner law recognized three the social-political function, economic and historical. In situations of contingencies, the state borrow and interest rate grow implying an increase in debt service expenditure.

2.1.3 Keynesian Theory

Agreeing with Wagner Law is the Keynesian theory. According to the Keynesian economists, consumers treat government debt as net wealth and a substitution of debt for taxes has a positive influence on private consumption and aggregate demand. However, the consequent decrease in private and national saving implies an increase in the real interest rate, which crowds out private investment. The reduction in the capital accumulation then leads to a reduction of the long-term growth prospects of the economy. This negative long-run effect offsets some of the positive short-term effects of the government deficit

2.1.4 Richardson Equivalence Principle

The Ricardian Equivalence enthused the irrelevance of fiscal policies and proposes that for a certain level of expenditure replacement of debt for taxes has no effect on demand and interest rate and a present cut in taxes imply future raise in tax. Also, borrowing currently postpones tax due now to the future, consumption is not affected and increased disposable income is saved. As borrowing only postpone taxes for the future, consumers, who are simultaneously taxpayers, anticipating the increase in future taxes, do not consider the current tax cut and the consequent increase in disposable income as being permanent. If the government substitutes debt for tax, such individuals will simply save the additional income instead of increasing their consumption. The increase in savings will be used to buy the government bonds which they will use the pay for future tax increases necessitated by the government's retiring of its accumulated debt (Saeed and Khan 2012). Therefore, if private savings increase by the same proportion as does the budget deficit, the net national savings remain unaffected and this in turn

2.2 Conceptual Framework

2.2.1 Companies' income tax

Company income tax refers to tax levelled on adjusted profit or chargeable profit of companies after adjustment for disallowable items and non-taxable income. In Nigeria company income tax, was first introduced in 1961. This law has been amended many times and is currently called the Company Income Tax Act. The Company Income Tax Act (CITA) is the principal law that regulates the taxation of companies in Nigeria (Resolution Law Firm, 2020). Resident companies are liable to corporate income tax (CIT) on their worldwide income while non-residents are subject to CIT on their Nigeria-source income. Operationally, company income tax (CIT) refers to tax billed on the profits of registered companies in Nigeria, both locally and foreign-owned. The tax is based on accounting profits adjusted for tax purposes. Federal Board of inland revenue service is empowered by law to collect CIT on behalf of government

2.2.2 Petroleum profit tax

Petroleum profit tax in Nigeria refer to tax paid on adjusted or chargeable profits of oil and gas firms engaged in upstream petroleum operations in Nigeria. The components of chargeable Petroleum profit consist of rents, royalties, margins and profit-sharing elements associated with oil mining, prospecting and exploration leases less non allowable expenses plus none taxable income adjusted for balancing charges and capital allowances. PPT is administered by the Federal inland revenue service and the tax is paid by firms on sale of Hydrocarbons under the Petroleum Profits Tax Act of 1959, as amended. Petroleum operations imply oil prospecting, exploration, development, production activities or a combination of such activities, including construction, operation and maintenance of facilities, plugging and abandonment of Wells, safety, environmental protection, transportation, storage, sale or disposition of Petroleum to the Delivery Point, Site Restoration and any or all other incidental operations or activities as deemed necessary.

2.2.3 Value added tax

Valued- added tax is an indirect tax popularly referred to as VAT introduced via an act of parliament No. 102 of 1993 with effective implementation date January 1994. VAT was designed to be imposed on goods and services and borne indirectly by consumers of goods and services with the intent to abolish other forms of indirect taxes levied and ensure uniformity of rates being applied. Exemptions were granted on farming and transport equipment, fertilizers, veterinary medicine, food items, pharmaceutical and medical products, books and educational items. The aim of the exemptions being to improve agricultural production, prevent shortage of drugs and medical equipment, and boost education and acquisition of knowledge. Currently, VAT is on the concurrent list although presently being collected by the Federal Inland Revenue service for the Federal government and is a major source of internally generated revenue for the government and it proceed is shared during the monthly allocations to the three tiers of government.

2.2.4. Exchange rate

The amount which a local currency is given in exchange for a foreign currency is referred to as exchange rate. This is greatly influenced by government policies and balance of payment. It is driven by forces of demand and supply which causes the rate to change in a volatile manner. According to Ozturk (2006), exchange rate volatility refers to the persistent up and down movements in the barter price of a country's currency. exchange rate volatility has dominated international trade and finance and affects developing countries due to heavy demand and propensity to consume foreign goods.

2.2.5 Capital expenditure

Capital expenditure simply refer to the amount of funds set aside for capital projects and infrastructural development at a specific time. Normally, this expenditure is set out in a country's budget and the schedule of projects to be made is approved during a budget session by the national assembly before funds are released for projects specified by the government.

2.3 Empirical Review

Ogunleye (2009) assessed the linkage between exchange rate volatility and Foreign Direct Investments (FDI) inflows in Nigeria and Southern Africa and employed endogenize exchange rate volatility and a two – stage Least Squares methodology. Findings show that in Nigeria , there is a statistically significant relationship between foreign direct investment and exchange rate with exchange rate volatility retarding FDI inflows and FDI inflows increasing exchange rate volatility.

Benjamin Ebikoya (2019) examined the impact of exchange rate volatility on economic growth in Nigeria. and employed the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model and the system Generalized Method of Moments (GMM) technique to analyses the time series data from the period January 1980 to December 2017. The study used the Augmented Dickey–Fuller and Philips–Perron tests to determine the presence of a unit root and the Johansen co-integration test to establish the relationship among the variables in the study. The results of the estimates offer evidence that exchange rate volatility persists throughout the study period, and has a negative and significant effect on the economic growth of Nigeria. This result suggests that excessive volatility due to low inflows is inimical to the growth of the Nigeria economy.

Odili (2015) analyze the impact of real exchange rate volatility and economic growth on exports and imports in Nigeria using a vector error correction model and employ time series data from 1971 to 2012. The study finds that in both the short-run and long-run, Nigeria's trade flows were chiefly influenced by exchange rate volatility, real exchange rates, real foreign income, real gross domestic product, terms of trade and exchange rate policy switch. The findings further reveal that exchange rate volatility depressed trade flows in the long-run

According to Côté (1994), exchange rate volatility impact users directly because of uncertainty and adjustment costs, and also impact indirectly the structure of output, through investment and policies of government. This suggests that in economies where exchange rate volatility persists,

the degree of openness to trade or trade liberalization policies could have a greater impact on revenue generation.

Sabina, Manyo, and Ugochukwu (2017) found a negative relationship between exchange rate volatility and economic growth in Nigeria. Using Generalized Method of Moments (GMM) the result show that volatility of exchange rate has negative and significant impact on the growth of the Nigerian economy. Government Expenditure and External Reserve has positive and significant impact on the growth of the Nigerian economy for the period under study.

Yıldız, Ide, and Malik (2016) use Engle-Granger cointegration approach to examine the relation between echange rate volatility Turkey's economic growth and exchange rate volatility relationship, by using quarterly data for the period 1998:1-2014. The results provide evidence for the existence of both short- and long-term relationship between economic growth and real effective exchange rate. Olowe (2009) examined volatility of Naira/Dollar exchange rates in Nigeria using Generalized Autoregressive Conditional Heteroskedasticity (GARCH) models on data set for the period 1970 and result indicated that all GARCH family models showed persistent volatility for both fixed, flexible and managed exchange rate.

As DeGrauwe (1988) noted, exchange rate volatility can have a detrimental impact on trade and by extension, trade tax revenue depending on the degree of risk aversion of trade players. Demir (2013) employs firm level dataset to analyze the effects of exchange rate volatility on the growth performances of domestic versus foreign, and publicly traded versus non-traded private manufacturing firms in, Turkey. The empirical results using dynamic panel data estimation techniques suggest that exchange rate volatility has a significant growth reducing effect on manufacturing firms. However, having access to foreign and domestic equity markets is found to reduce these negative effects at significant levels.

Kwesi Ofori et al., (2018). To estimate the effect of exchange rate volatility on tax revenue, the study employed the Auto Regressive Distributed Lag (ARDL) technique after the yearly exchange rate volatilities had been generated using the GARCH (1,1) method. The results of the study suggest that exchange rate volatility has a deleterious effect on tax revenue both in the short-run and long-run but the effect is more pronounced in the long-run than the short-run

Aliyu (2009) using standard deviation examined exchange rate volatility impact on non-oil export flows in Nigeria between 1986 and 2006. Findings show exchange rate volatility reduce non-oil exports in Nigeria. Kasman and Kasman (2005) investigate the impact of real exchange rate volatility on Turkey's exports to its most important trading partners using quarterly data for the period 1982 to 2001. Their results indicate that exchange rate volatility has a significant positive effect on export volume in the long run..

De Vita & Abbott, 2004). exchange rate volatility can have a short-term and long-term impacts on trade taxes. Even though flexible exchange rate is supposed to be self-correcting following persistent instability, at least theoretically, the long and slow adjustment period, in reality, could generate higher risk with deleterious effects on exports volumes and by extension trade tax revenue. Adeniyi and Olasunkanmi (2019) use ARDL model to examine the impact of exchange rate volatility on economic growth in Nigeria. The findings also exhibited significant

impact of export on Gross Domestic Product while import is insignificant both in the short and the long run. The study established insignificant positive relationship between exchange rate volatility and economic growth in Nigeria.

Hussain and Farooq (2009) investigate the relationship between economic growth and exchange rate volatility in Pakistan by using an ARDL model. Cointegration relationship between growth, exchange rate volatility, reserve money and manufacturing are detected in the long run except exports and imports. Conclusion suggests that domestic economic performance is very sensitive to the exchange rate volatility in the long-run.. Yinusa (2008) examined how nominal exchange rate volatility and dollarization relate in Nigeria using Granger causality test on data obtained for the period 1986–2003. The study showed semi causality between variables of study but the causality from dollarization to exchange rate volatility was significant and strong

3. Research Method

3.1. Data and Measurement of variables.

The data for the study was obtained from Central Bank of Nigeria annual bulletin and publications by Federal Board of inland revenue service. The study is based on ex-post facto and longitudinal design. The Design is ex post facto because it is based on past data on events that had already taken place and longitudinal because of the long number of years covered by the study 1994 to 2021. Secondary data was used for the study. The tax structure component being independent variables were proxied by log of total revenue from petroleum profit tax, log of total revenue from Company income tax and log of total revenue from value added tax. The moderating variable meant to account for budget deficit financing is public debt whilst rate of conversion of local currency to united dollars is the exchange rate and log of capital expenditure profile of government represents infrastructural development.

The measurement of variables is as stated on the table below:

Tabel 1. The measurement of variables

Variables	Represented By	Measurement	Expected Sign
Petroleum profit tax	PPT	Total Petroleum tax revenue generated by the government in Nigeria as reported by Federal Inland Revenue service in a given year	positive
Corporate Income Tax	CIT	Total tax revenue generated by the government of Nigeria from non -petroleum companies as reported by	Positive

		Federal Inland Revenue service in a given year	
Value Added Tax	VAT	Total tax revenue generated from indirect tax (Value added tax) levied on good and services by the government of Nigeria in a given year	Positive
Public Debt	PUD	Total funds borrowed by the government of Nigeria both domestic and international debt to finance deficit in budgets by the government of Nigeria in a given year	Positive
Exchange Rate	EXCH	A given quantity of naira given in exchange for one united states dollar or any other international currency	Positive
Capital Expenditure	CAPE	Total money spent in Nigeria from its total revenue for infrastructural development and to fund capital projects indicated in the budget for a given year	Positive

The study adopted multiple regression analysis and auto regressive distributive lag (ARDL) to determine the strength of the relationship and long run implications of tax structure on exchange rate and capital expenditure. To test for stationarity Unit root test was conducted using Augmented Dickey Fuller and Kwiatkowski Phillips Schmidt while Granger causality test was conducted to determine the direction of relationship amongst the variable. Post estimation tests were conducted. To test for multicollinearity the centered variance inflation factors (CVIF) was conduct whilst the Nyblom-Hansen statistic tests for parameter constancy against the alternative hypothesis was carried out to identify stability of regression. A visual test of the stability of the estimates is also conducted using the CUSUM of squares tests. This helps to eliminate doubt about possible outlier regression for any of the groups in the sample

3.2 Model specification

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The estimation is as shown below:

$$EXCH = \beta_0 + \beta_1 \text{LogPPT} + \beta_2 \text{LogCIT} + \beta_3 \text{LogVAT} + \beta_4 \text{PLogPUD} + U_{1,t}$$

(i)

$$CAPE = \beta_0 + \beta_1 \text{LogPPT} + \beta_2 \text{LogCIT} + \beta_3 \text{LogVAT} + \beta_4 \text{PLogPUD} + U_{2,t}$$

(ii)

Unit root test

Regressing a non-stationary series on another would generate spurious results. We use Augmented Dickey-Fuller (ADF) technique developed by Dickey and Fuller (1979) to guard against this and to use appropriate estimation techniques for the analysis. The trend and intercept of the unit root are represented in equations (8) and (9), respectively:

$$\Delta Y_t = \beta_0 + \lambda Y_{t-1} + \beta_i \Delta Y_{t-1} + \mu_t \quad \text{for intercept} \dots\dots\dots (iii)$$

$$\Delta Y_t = \beta_0 + \lambda Y_{t-1} + \beta_i \mu + \beta_i \Delta Y_{t-1} + \mu_t \quad \text{for trend} \dots\dots\dots (iv)$$

where t Y is the tested variable for unit root, Δ is the first difference, t μ denotes error term at period, i tY – represents the one period lag of the tested variable for unit root.

Autoregressive distributed lag (ARDL)

We proceed to examine short- and long run relationship among the variables. Using autoregressive distributed lag (ARDL) known as the bound test approach to co-integration. ARDL model developed by Pesaran, Shin and Smith (1996) and later popularized by Pesaran, Shin and Smith (2001) is more advantageous to other co-integration procedures as it can be used when the variables under consideration are integrated of order zero $I(0)$ and order one $I(1)$ but will crash when integrated stochastic trend of $I(2)$ is found. The unrestricted error correction mechanism for testing co-integration among the variables used in this study is stated as follows:

$$\begin{aligned} \Delta EXCH_t = & \beta_0 + \sum \beta_1 \Delta \text{LogPPT}_{t-1} + \sum \beta_2 \Delta \text{LogCIT}_{t-1} + \sum \beta_3 \Delta \text{LogVAT}_{t-1} \\ & + \sum \beta_4 \Delta \text{LogPUD}_{t-1} + \alpha_0 + \alpha_1 \Delta \text{LogPIT}_{t-1} + \alpha_1 \Delta \text{LogPPT}_{t-1} + \alpha_2 \Delta \text{LogCIT}_{t-1} \\ & + \alpha_3 \Delta \text{LogVAT}_{t-1} + \alpha_4 \Delta \text{LogPUD}_{t-1} + U_{1,t} \end{aligned} \quad (v)$$

$$\Delta \text{CAPE}_t = \beta_0 + \sum \beta_1 \Delta \text{LogPPT}_{t-1} + \sum \beta_2 \Delta \text{LogCIT}_{t-1} + \sum \beta_3 \Delta \text{LogVAT}_{t-1} + \sum \beta_4 \Delta \text{LogPUD}_{t-1} + \alpha_1 + \alpha_1 \Delta \text{LogPPT}_{t-1} + \alpha_2 \Delta \text{LogCIT}_{t-1} + \alpha_3 \Delta \text{LogVAT}_{t-1} + \alpha_4 \Delta \text{LogPUD}_{t-1} + U_{2,t} \quad \dots\dots\dots (vi)$$

The ARDL long-run model is estimated if cointegration is found while the short-run model is estimated if otherwise

$$\Delta \text{EXCH} = \beta_0 + \beta_1 \text{LogPIT}_{t-1} + \beta_2 \text{LogPPT}_{t-1} + \beta_3 \text{LogCIT}_{t-1} + \beta_4 \text{LogVAT}_{t-1} + \beta_5 \text{LogPUD}_{t-1} + U_{1,t} \quad (vii)$$

$$\Delta \text{CAPE} = \beta_0 + \beta_1 \text{LogPIT}_{t-1} + \beta_2 \text{LogPPT}_{t-1} + \beta_3 \text{LogCIT}_{t-1} + \beta_4 \text{LogVAT}_{t-1} + \beta_5 \text{LogPUD}_{t-1} + U_{2,t} \quad (viii)$$

$$\Delta \text{EXCH} = \alpha_0 + \sum \alpha_1 \Delta \text{LogPIT}_{t-1} + \sum \alpha_2 \Delta \text{LogPPT}_{t-1} + \alpha_3 \sum \Delta \text{LogCIT}_{t-1} + \alpha_4 \sum \Delta \text{LogVAT}_{t-1} + \alpha_7 \sum \Delta \text{LogPUD}_{t-1} + \text{ECM} + U_1 \quad (ix)$$

$$\Delta \text{CAPE} = \alpha_0 + \alpha_1 \sum \Delta \text{LogPIT}_{t-1} + \alpha_2 \sum \Delta \text{LogPPT}_{t-1} + \alpha_3 \sum \Delta \text{LogCIT}_{t-1} + \alpha_4 \sum \Delta \text{LogVAT}_{t-1} + \alpha_7 \sum \Delta \text{LogPUD}_{t-1} + \text{ECM} + U_2 \quad (x)$$

4. Results and Discussion

4.1. Summary Statistics

The descriptive statistics of the time series data for the variables used in the study are reported in Table .

Table 2: Descriptive Statistics

Variable	Mean	Max.	Min.	Std. Dev.	Skew.	Kurt.	J-B	Prob.
EXCH	173.51	416.05	69.84	104.73	1.44	4.19	10.87	0.00
GCAPE	21.58	162.95	-35.47	38.98	1.92	7.66	1.06	0.61

CIT	20.84	39.74	6.32	9.25	0.15	1.89	1.49	0.48
PPT	58.90	85.67	34.45	15.67	0.12	1.77	1.77	0.41
VAT	20.25	35.56	8.01	7.80	0.37	2.40	1.01	0.60
PUD	22.33	61.51	7.01	17.2	1.27	5.54	5.65	0.98

From the table the exchange rate of the naira to the dollar was very high at 173.51 on average during the period of the analysis. It reached 416 naira to a dollar in 2021 and the kurtosis is over 4.0, indicating a very high level of movement over the period. The growth rate of capital expenditure in the country was 21.58 percent on average, which is very high and shows that capital budgeting has been on the increase in the country over the years. This is an important platform for stimulating macroeconomic performance in a country.

The tax structure variables are measured in terms of their respective shares in total tax revenues in order to provide a more nuanced analysis of the description of the various tax revenues instead of the total taxes. On average, petroleum profit taxes have had the highest share of total tax revenue in the country over the period. Both CIT and VAT have similar average ratios, indicating that the two tax structures have remained the same in terms of their shares in total tax revenues. Maximum CIT share of 39.74 percent is however greater than the maximum VAT share of 35.56. On the other hand, minimum VAT share of 8.01 percent is greater than the minimum CIT share of 6.32 percent. The ratio of public debt is 22.33 percent on average, with a maximum value of 61.5 percent. This shows that public debt is high with implications on debt overhang in the country.

In Tables 2 the J-B statistic for all the variables (except three – INF and EXC) are insignificant, which means that the hypothesis of non-normality of the data series can be rejected at the 5 percent level. Thus, it can be seen that most of the series are normally distributed and the data can therefore be estimated within a time series-based estimation framework like the one employed in this study.

The initial patterns of relationship among the variables are observed through the computed correlation matrix which is shown in Table 3. A positive correlation exists among the three tax components, indicating that they all move in the same direction. In particular, the correlation between CIT and VAT is the highest at 0.94. This is a strong correlation and shows that both tax revenues change at a very similar level. Note that both taxes are strongly related to modern sector economic activities, although they different in terms of the tax burden definition (while CIT is direct tax, VAT is indirect). The high correlation coefficient between CIT and VAT also throws up an important econometric issue in the empirical analysis. Essentially, the correlation coefficients between two explanatory variables in a model is not expected to be greater than 0.7, otherwise, the model may suffer the problem of multicollinearity (Gujarati, 2009). The coefficient of two of the important explanatory variables (CIT and VAT) here is 0.94 percent which may present issues for the empirical estimation. However, this issue is addressed by the

empirical strategy adopted in the model (ARDL) which allows the use of lags in the estimation. Also, the tax components are estimated in their log forms which also helps to mitigate the problem of multicollinearity in the estimated model.

The other variables in the model also have interesting correlation outcomes.

Table 3. Correlation Matrix

Variable	CIT	PPT	VAT	EXCH	CAPE
CIT	1				
PPT	0.638 (0.00)	1			
VAT	0.941 (0.00)	0.607 (0.00)	1		
EXCH	0.887 (0.00)	0.486 (0.01)	0.949 (0.00)	1	
CAPE	0.754 (0.00)	0.848 (0.00)	0.673 (0.00)	0.499 (0.01)	1

Source: Author's computation

The major aspect in which this study seeks to make extant contribution is on how the tax structure in Nigeria influences macroeconomic performance in a distributional form. There is therefore the need to observe the pattern of relationship among the tax structure components (PPT, CIT and VAT) as well as among the main dependent variables (measures of macroeconomic performance).

Given the nature of empirical analysis in the study, the relationship between capital expenditure and each of the macroeconomic performance factors is of utmost importance. In the correlation result, it is seen that capital expenditure is significantly related with exchange rate

4.2 Tests of Time Series Properties of the Variables

4.2.1 Unit root

The test for stationarity of the data series is performed using Augmented Dickey Fuller (ADF) and the Kwiatkowski-Phillips-Schmidt-Shin (KPSS) procedure. While the ADF test is an indirect process of testing for unit roots, the KPSS tests are more direct in terms of the null hypothesis. The results of the unit root tests are presented in Table 4. From the results of the ADF tests reported in the first panel of the Table, it can be seen that the ADF test statistics for each of the variables in levels (are less than the 95 percent critical values. On the other hand, the test statistic values for the series in first differences are greater than the critical values at the 5 percent significance level. Thus, those variables are non-stationary in levels but their first differences were found to be stationary. This implies that most the variables in the study are

integrated of order one (or I[1]). On the other hand INFL, DDYR, EXDYR are integrated of order zero (or I[0]).

Table 4: Unit Root test for Variables

Variable	ADF Test		KPSS		Order of Integration
	Levels	First Difference	Levels	First Difference	
EXCH	-2.734	-12.75*	0.666*	0.222	I[1]
CAPE	-1.271	-5.483*	0.519*	0.146	I[1]
CIT	-0.331	-15.46*	0.648*	0.155	I[1]
PPT	-1.58	-4.415*	0.556*	0.248	I[1]
VAT	-2.703	-5.181*	0.673*	0.354	I[1]
PUD	-1.152	-7.067*	0.632*	0.232	I[1]

Note: * indicates signifies at 5 percent; 95% critical values are reported in parentheses below each test value

Source: Author's computation

The KPSS test for stationarity (which helps to improve on the robustness of the unit root test by ADF) “is more relevant in capturing the actual stationarity patterns of the series since the test hypothesis particularly show whether the series are stationary or not and not in reference to the possession of unit roots”. The interpretation of the test outcomes is as follows: a significant KPSS coefficient for a variable indicates non-stationarity. In other words, the null hypothesis for the test is that the data is stationary; while the alternate hypothesis for the test is that the data is not stationary. The result shown in the second panel of Table 4 indicates that for each of the series (except INF), the null hypotheses of stationarity cannot be rejected for the variables in first differences (the tests statistics fail the test). This indicates that the series are difference-stationary and that all the variables are actually I[1]. Thus, a dynamic long run relationship may be estimated based on the ARDL approach to cointegration for the dynamic analysis (Ighodaro & Adegboye, 2020).

4.2.2 Cointegration analysis

The unit root test above suggests that most of the variables are I(1) while one is I(0). This suggests that the traditional test for common stochastic trends in the data series (or cointegration test) may not be sufficient for determining the long run relationship. Hence, following Pesaran et al (2001), an ARDL approach to cointegration is conducted in the study. In this direction, the Bounds testing procedure for cointegration is adopted in this study. Moreover, the application of error correction processes (based on the ARDL approach to cointegration) further indicates the relevance of the cointegration tests. The results of the Bounds test for cointegration

are shown in Table 5 and the evaluations are based on the critical F-statistic values for the lower and upper bounds.

Table 5: Results of Bounds Approach to Cointegration Test

Equation (Dependent variable)	F-stat	I0 Bound (5%)	I1 Bound (5%)	Cointegration
Exchange rate	5.487	2.27	3.28	Yes
CAPE	12.64	2.27	3.28	Yes

Source: Author's computations

In the Bounds test result in Table 5, the following procedure is used for evaluation: if at the 5 percent significance level, the estimated F-value is greater than both the lower test (I0 Bounds) and the upper test (I1 Bounds) values, then there is no cointegration among the variables. If the estimated F-value lies between the two Bounds values, then there is need to proceed with a lesser structure of the ECM analysis by applying the Josselius procedure. From the Table, the F values for the tests are all greater than both the lower and upper Bounds values at the 5 percent levels. According to the empirical output of the F-values in all the panels of Table 4.4 therefore, it can be seen that the null hypothesis of no long-run relationship between macroeconomic variables and tax structure composition is rejected at the 5 percent level. These results reveal that for each of the equations for the tax structure components and the other control variables have strong long run relationships with the dependent variable.

4.3 Analysis of ARDL Results

In this section, the results of the estimated ARDL model for the relationships are presented and analysed. It should be noted that the dynamic from of the ARDL estimates suggests that both the long run and short run estimates are presented. The stable estimates are however based on the long run relationships.

4.3.1 Lag length selection

Generally, cointegration-based analyses (such as the ARDL) are susceptible to variations and instability on the basis of their lag structures. This is more serious for autoregressive estimations (Greene, 2011). Hence, given that the collection of variables in the study have been demonstrated to be cointegrated (based on the Bounds tests in Table 4.4), the lag selection test is also performed to determine the maximum lags that can generate optimum estimates for the coefficients in the ARDL estimation. In the lag selection, optimality of the model was determined using both the Akaike Information Criterion (AIC) and Schwarz–Bayesian Criterion (SC). The optimum lag length is determined by considering the least values for the test coefficients. The result is shown in Table 6 and indicates that, for each of the equations, the second lag possesses the minimum values. This implies only the first lag is expected to be retained for the ARDL estimation since each of the selection tests indicates the first lag as the

optimum lag length. Thus, a lag structure of two periods is selected as representing the structure that will ensure more stable coefficient estimates. The low optimal lag structure may be related to the small sample used in the study as suggested by Ighodaro and Adegboye (2020).

Table 6: Lag Length Selection Criteria

No of Lags	EXCH		CAPE	
	AIC	SC	AIC	SC
0	3.28	0.55	3.12	0.34
1	-2.41	-1.72	-4.27	-1.76
2	-4.27*	-3.71*	-4.29*	-3.84*
3	-3.87	-3.09	-3.18	-2.83

Note: * indicates selected lag. Source: Author, computation.

4.3.2 Regression analysis.

(iv) Tax Structure and Exchange rate

The results for the effects of tax structure components on the exchange rate are reported in Table 7. The diagnostic statistics of the estimates are also impressive, given that the adjusted R-squared value is 0.80, indicating that 80 percent of the variations in exchange rates was captured within the model. For the short run results, the coefficients of both current and lagged PPT variable as well as that of CIT are significant at the one percent level. This implies that only the direct taxes are effective in influencing exchange rate movements in Nigeria.

Table 7: Results for tax structure and exchange rate

Variable	Coefficient	t-Statistic	Prob.
<i>Long run</i>			
LPPT	-0.704	-6.014	0.000
LCIT	-0.933	-5.724	0.000
LVAT	0.072	0.454	0.660
LPUD	0.114	2.465	0.033
Constant	-4.879	-5.001	0.001
<i>Short run</i>			
Δ LPPT	-0.281	-9.434	0.000
Δ LPPT _{t-1}	0.179	6.410	0.000
Δ LCIT	-0.232	-4.054	0.002

$\Delta LPUD$	0.010	0.999	0.342
ΔLGD_{t-1}	1.152	7.577	0.000
ECM_{t-1}	-0.657	-11.220	0.000
Adj R-sq.	0.800		

Source: Author's computation

The coefficient of current PPT is negative, while that of the lag is positive, indicating that although PPT immediately stimulates exchange rate depreciation, the delayed impact is to improve the exchange rate in the short run. On the other, the coefficient of CIT in the short run equation is negative, indicating that increased CIT leads to decline in the value of the dollar in terms of naira (i.e., exchange rate appreciation). The coefficients of lagged inflation and those of both current and lagged real GDP are significant and positive, indicating that both inflation rate and economic growth tend to generate short-term depreciation of the naira in Nigeria. Rising inflation is shown to be inimical to the exchange rate movement in Nigeria, especially in the short run.

The coefficient of the ECM term is also significant and negative, which shows that a long run stability exists in exchange rate when the tax and other variables are put into consideration. The speed of long run adjustment is also relatively high, considering that the ECM term has a coefficient of -0.657. This shows that about 65 percent of the adjustment to long run equilibrium is completed in the first period. For the long run estimates, the coefficients of PPT and CIT are both significant and are both negative. On the other hand, the coefficient of VAT failed the significance test even at the 5 percent level. This shows that the two direct tax components significantly improve the exchange rate in Nigeria. In other words, raising the tax revenues tend to reduce the value of the dollar in terms of the naira in the long run. Thus, the result shows that long run exchange rate improvement is also achieved via changes in the two direct tax revenue components. Essentially, the impact of indirect taxes on the exchange rate is found to be insignificant both in the short run and in the long run, given that the coefficient of VAT failed the significance test at the 5 percent level. Surprisingly, the result shows that in the long run, inflation rate improves the exchange rate while economic growth weakens the exchange rate.

(vi) Tax Structure and Capital Expenditure in Nigeria

A major argument in this study is that one of the immediate components of the economy that significantly responds to tax revenue changes is the expenditure component of government. Essentially, government expenditure becomes one of the important means of transferring tax revenues by government into productive economic outcomes in the country (Fölster & Henrekson, 2001; Arodoye & Adegboye, 2018; Efuntade et al., 2020). In particular, the capital expenditures of government are targeted at influencing the major economic indices of government like growth rates, employment, and inflationary pressures. Hence, the study notes that apart from the indirect effects of tax revenues on macroeconomic factors in the country, strong indirect effects (through capital expenditure) are to be expected. Thus, the model that estimates the impact of divergent tax structure outcomes on capital expenditure is also

presented. The outcome of the estimates will show whether tax revenues exert more than direct impacts on macroeconomic indices in Nigeria.

The results of the short and long run effects of tax structure on capital expenditure in Nigeria are presented in Table 8. In the short run estimates, all the coefficients of the tax structure variables passed the significance test at the 5 percent level. This indicates that tax revenues are critical for influencing short run changes in capital expenditure. The coefficients of current PPT, current CIT and complete VAT are all positive, which show that all forms of taxes promote capital spending by government in Nigeria in the short run. Thus, increasing tax revenues will immediately deliver positive impacts on the budgetary provisions for capital spending in Nigeria. Moreover, given that the earlier analysis has confirmed that capital expenditure improves exchange rate, the positive impact of tax revenues on short run capital expenditure confirms that taxes have significant indirect impact on short run macroeconomic performance in Nigeria.

Table 8: Results for tax structure and capital expenditure

Variable	Coefficient	t-Statistic	Prob.
<i>Long run</i>			
LPPT	0.453	4.119	0.015
LCIT	2.057	2.884	0.038
LVAT	-1.696	-1.351	0.248
LPUD	0.071	0.763	0.488
EXCH	-0.740	-2.780	0.050
Constant	4.507	4.407	0.012
<i>Short run</i>			
Δ LPPT	0.430	10.714	0.000
Δ LPPT _{t-1}	-0.098	-2.600	0.060
Δ LCIT	0.383	4.067	0.015
Δ LCIT _{t-1}	-1.000	-9.992	0.001
Δ LVAT	0.853	7.848	0.001
Δ LVAT _{t-1}	1.495	10.545	0.001
Δ LPUD	-0.066	-3.575	0.023
Δ LPUD _{t-1}	-0.077	-4.136	0.014
Δ EXCH	-0.209	-1.309	0.261
Δ EXCH _{t-1}	-1.125	-5.442	0.006
ECM _{t-1}	-0.792	-14.871	0.000
Adj. R-sq.	0.963		

Source: Author's computation

The coefficient of the error correction terms has the expected negative sign and it also passes the significance test at the 1 percent level. Thus, it is shown that long run adjustment to equilibrium is possible following any short-term deviations in the system. The size of the speed

of adjustment is also large as indicated by the ECM coefficient of -0.792. This suggests that over 79 percent of adjustment to equilibrium in the long run is completed within the first period.

The long run results also report interesting outcomes as shown in Table 4.11. The coefficients of the two direct tax components are significant at the 5 percent level, while that of VAT (direct tax component) failed the test at the 5 percent level. This result shows that while PPT and CIT significantly influence capital expenditures in Nigeria, VAT has no significant impact. It also suggests that VAT does not exert indirect long run effects on macroeconomic performance through the capital expenditure channel. The coefficient of CIT is however negative, indicating that increasing CIT tends to reduce capital expenditures in Nigeria. On the other hand, the coefficient of PPT is positive which indicates that only PPT tends to directly improve capital expenditure or indirectly improve long run macroeconomic performance through the channel of capital expenditure in Nigeria. The coefficient of public debt (PUD) failed the significance test in the long run estimates, while the coefficient of exchange rate (EXC) is significant at the 5 percent level and also possesses a negative sign. This implies that in the long run, exchange rate depreciation tends to limit capital expenditures in Nigeria.

4.3.3 Analysis of causality

. The results are shown in Table 9 where the tests are based on the F-statistic test outcomes for each of the null hypotheses. If the coefficient of the Granger causality test is significant, then the associated null hypothesis is rejected at the level of significance from the F-test

Table 9. Granger Causality Results

Null Hypothesis:	Obs	F-Statistic	Prob.	Direction of Causality
EXCH does not Granger Cause LGDP	26	0.83	0.45	None
LGDP does not Granger Cause EXC		2.65	0.09	
LCAPE does not Granger Cause LGDP	26	3.98	0.03	Unidirectional
LGDP does not Granger Cause LCAPE		1.16	0.33	
LCAPE does not Granger Cause EXC	26	0.19	0.82	None
LEXCH does not Granger Cause LCAPE		0.77	0.48	
LCIT does not Granger Cause EXC	26	0.65	0.53	None
EXCH does not Granger Cause LCIT		1.81	0.19	
LPPT does not Granger Cause EXC	26	1.68	0.21	None
LEXCH does not Granger Cause LPPT		0.88	0.43	
LVAT does not Granger Cause EXC	26	0.48	0.62	Unidirectional
EXCH does not Granger Cause LVAT		9.69	0.00	
LCIT does not Granger Cause LCAPE	26	1.06	0.36	None
LCAPE does not Granger Cause LCIT		5.75	0.01	
LPPT does not Granger Cause LCAPE	26	3.90	0.04	Unidirectional
LCAPE does not Granger Cause LPPT		2.60	0.10	
LVAT does not Granger Cause LCAPE	26	1.18	0.33	None
LCAPE does not Granger Cause LVAT		0.52	0.60	

LPPT does not Granger Cause LCIT	27	4.09	0.03	Unidirectional
LCIT does not Granger Cause LPPT		0.87	0.43	
LVAT does not Granger Cause LCIT	26	3.64	0.04	Reverse
LCIT does not Granger Cause LVAT		4.64	0.02	
LVAT does not Granger Cause LPPT	26	0.29	0.75	None
LPPT does not Granger Cause LVAT		0.68	0.52	

There is no causality between exchange rate and economic growth

4.4 Post Estimation Tests

In order to check for the robustness of the estimates in the study, the multicollinearity, normality and serial correlation tests are conducted, and the results are presented.

4.4.1 Multicollinearity

. In Table 10, the results of the multicollinearity test for the each of the model results are presented. In the result, only the centred variance inflation factors (CVIF) variables are reported since each of the equations contains a constant term. The VIF value must be less than 10 for the variable in an equation to be free from collinearity. In the report on Table 4.12, the Centred VIF values for all the variables are less than 10. Thus, it can be seen that the estimated coefficients for the equations do not integrate excessively among themselves and the estimates are therefore reliable.

Table 10. Post Estimation Test Results

Variable	Coefficient Variance	Centered VIF
LPPT	0.027	5.354
LCIT	0.256	6.263
LVAT	0.155	4.150
LPUD	0.021	9.801

Source: Author's computations

4.4.2 Tests for stability of regression

In order to test the initial stability of cointegration parameters for the estimates, the Nyblom-Hansen (L_c) tests are also included in Table 11 The “Nyblom-Hansen statistic tests for parameter constancy against the alternative hypothesis that the parameters follow a random walk process” (Balcilar et al, 2013). From the results it is seen that the coefficients are all insignificant at the 5 percent level. Thus, there is a stable long run relationship between tax and revenues.

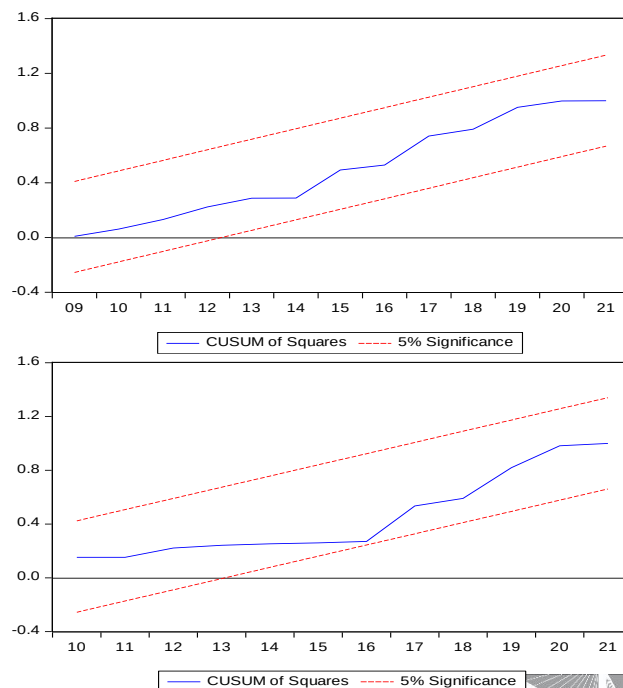
Table 11: Post estimation test results

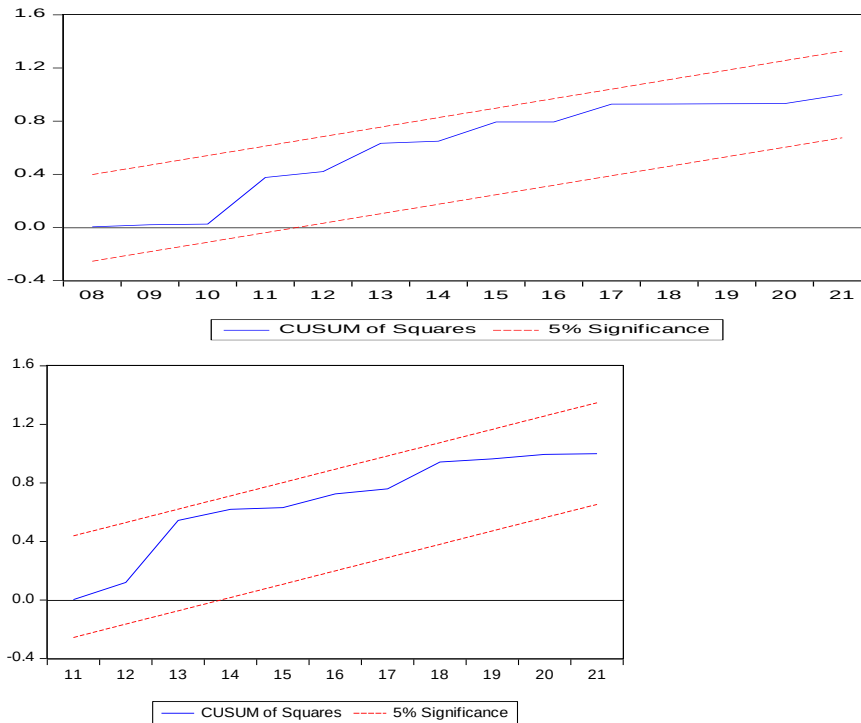
<i>Model</i>	<i>Test</i>	<i>Stat. (prob)</i>
<i>EXCH</i>	<i>L_c value (Bootstrap p value)</i>	1.02 (0.87)
	<i>Normality test (J-B)</i>	0.139 (0.93)
	<i>Serial Correlation LM Test</i>	2.679 (0.13)
<i>CAPE</i>	<i>L_c value (Bootstrap p value)</i>	0.653 (0.22)
	<i>Normality test (J-B)</i>	1.741 (0.42)
	<i>Serial Correlation LM Test</i>	0.009 (0.99)

Note: p-values in parentheses. Source: Author's computation

A visual test of the stability of the estimates is also conducted using the CUSUM of squares tests. This helps to eliminate doubt about possible outlier regression for any of the groups in the sample. The charts in Figure 1 show the result of the CUSUM of squares test for recursiveness of error accumulation for the five categories of revenues that were performed in the study. It can be seen that the CUSUM of squares line lies entirely within the dotted 5 percent significance bound line throughout the chart for each of the charts. This reveals that the estimations are all stable within the analysis and there are no issues of structural breaks or outlier effects in the estimations.

Fig 1: Parameter Stability Charts for the equations





Source: Author's computations

4.5 Discussion of Findings

The aim of the study is to examine the effect of tax structure on exchange rate and infrastructural development in Nigeria. An important outcome of the data analysis in the study by trend analysis is the realization that the three tax components in the study were found to be high in relation to total tax

The study found that, only direct taxes led to improvement in exchange rate in the long run. This implies that direct taxes may be more effective in maintaining macroeconomic stability in Nigeria than application of indirect taxes. This finding agrees with De Vita & Abbott, (2004). exchange rate volatility can have a short-term and long-term impacts on trade taxes The study therefore establishes that direct taxes may deliver macroeconomic effects that are divergent from the Ricardian Equivalence proposition of the tax effects as also shown by Arodoye and Iyoha (2019), Finkelstein and Notowidigdo (2018). On the other hand, increases in indirect taxes tend to produce external effects that do not fully guarantee improvements in macroeconomic in Nigeria. This outcome can be explained by the fact that indirect taxes tend to generate more long-term effects or interactive outcomes than direct taxes. These findings agree with the study of As DeGrauwe (1988) who noted exchange rate volatility can have a

detrimental impact on trade and by extension, trade tax revenue depending on the degree of risk aversion of trade players

CIT only improves exchange rate but is not capable of promoting economic growth. Indeed, it was found that CIT revenues essentially lead to reduction in capital expenditure in the long run in Nigeria. The implication is that increased corporate tax rate will eventually reduce infrastructural development in Nigeria. Many previous studies have found similar results for both developed and developing economies. For instance, Ferede and Dahlby (2012) found that increased corporate income tax rates among sub-national levels in Canada resulted in lower private investment and slower economic growth. These outcomes are far-reaching and indicate that the tax structure is a critical issue in drawing the role of taxes on the Nigerian economy as also shown in Phiri (2016), Ogundana et al. (2017), and Nguyen (2019).

The study found that both PPT and CIT have significant negative impacts on exchange rate in the long run in Nigeria, indicating only the direct component of the tax structure in Nigeria significantly enhances exchange rate performance in Nigeria over time, while the effect of indirect tax components is insignificant. It was also revealed by the study that only PPT has a significant indirect or channeled impact on macroeconomic performance through the capital expenditure in Nigeria.

5. Conclusion

From the result of the study increase in Direct taxes (ppt and CIT) improves the exchange rate we conclude that direct taxes can be used by policy makers to tackle devaluation and ensure economic stability However, we also noted that a component of direct taxes corporate tax reduces capital expenditure which implies reduction in spending for infrastructural development. This implies that in the long run, exchange rate depreciation tends to limit capital expenditures in Nigeria We recommend that in trying to tackle exchange rate fluctuations government should note the negative effect of corporate tax while trying to use direct taxes as a tool for tackling depreciating value of the currency. We found that indirect taxes have tend to produce external effects that do not fully guarantee improvement. We recommend government policy makers should use VAT with caution while trying to increase revenue or as a fiscal policy as it may create shocks in the economy.

The theories relevant to this study were highlighted in the theoretical framework. The benefit principle suggests that citizens benefiting more from government expenditure and spending should pay more or that tax payment should commensurate with government spending in the same proportion. The application of this principle connotes that allocation of resources to projects by the government will follow the pattern of tax payments. The higher the cost of the project the higher the expected tax beneficiaries are expected to pay. From the descriptive statistics, 21.58 percent of the revenue generated as tax is deployed for capital expenditure implying that only 21.58 tax revenue is used for infrastructural development. This negates the assumption of benefit theory which suggest that the higher the tax the higher the expenditure to beneficiaries. The positive impact of tax revenues on infrastructural development and improvement of exchange rate negates the economist perspective that an economic system

should only be driven by market forces without intervention by the tax system and therefore, taxation should be obliterated as economic decision-making processes are distorted by taxation.

Also, contrasting with the benefit principle is the socio-political theory by Adolph Wagner and proposes that social and political objectives should be the deciding factors in spending tax revenue. According to the theory, welfare evolution in the state emanates from free market capitalism as the citizens of the state request for social services commensurate with revenue growth. In Nigeria and from the findings of the study spending from tax revenue is not commensurate with payment thus negating benefit principle. It appears that spending is driven by social and political motives. Which the findings of the study seem to be in agreement with the socio-political theory

Furthermore, the Ricardian Equivalence enthused the irrelevance of fiscal policies and proposes that for a certain level of expenditure replacement of debt for taxes has no effect on demand and interest rate and a present cut in taxes imply future raise in tax. Also, borrowing currently postpones tax due now to the future, consumption is not affected and increased disposable income is saved while the Keynesian principle recommends government intervention and the use of fiscal policies to correct economic malaise. The result of our study supports the Keynesian theory and negates the Ricardian principle as the study indicates that increase tax revenue has an opposite effect on exchange rate and infrastructural development. Increase in tax revenue reduces the exchange rate and improve the currency while also encouraging increased capital expenditure and infrastructural development.

The study is relevant to Practitioners and policy makers. Only direct taxes led to improvement in exchange rate in the long run. This implies that direct taxes may be more effective in maintaining macroeconomic stability in Nigeria than application of indirect taxes on the other hand, as increases in indirect taxes tend to produce external effects that do not fully guarantee improvements in macroeconomic in Nigeria. This finding will guide policy makers in formulating policies that will enhance revenue from direct taxes if the desire of policy makers is improvement in exchange rate.

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