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TAX REVENUE VOLATILITY AND ITS IMPLICATION ON THE NIGERIA ECONOMIC GROWTH

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ABSTRACT

The study examined the analysis of the impact of tax revenue (TR) volatility on economic growth (EG) in Nigeria between the periods of 1994-2021, which is a period of 28years. This was done using the measures TR volatility, namely; Petroleum Profit Tax Volatility (PPTV), Value Added Tax Volatility (VATV), Company Income Tax Volatility (CITV) and Custom and Excise Duties Volatility (CEDV) in relation to economic growth proxied with Gross Domestic Product (GDP). The data was sourced from the CBN Statistical Bulletin and Annual Report and analyzed with descriptive statistics, correlation matrix, unit root test, Auto-regressive Distributed Lag (ARDL) Bound Co-integration test, and ARDL Co-integrating and Long form. The findings showed that PPTV has a p-value of 0.0089 and a p-value of 0.0051 on the short and long run (S&LR) respectively. Hence, PPTV had a considerable effect on GDP in the S&LR; VATV has a p-value of 0.0067 and 0.0001 both on the S&LR. Thus, VATV had a considerable effect on GDP in the S&LR; CITV has a p-value of 0.1838 and a p-value of 0.1892 in the S&LR respectively. Thus, CITV had an inconsequential effect on GDP in the S&LR and CEDV has p-values of 0.0253 and 0.0021 both on the S&LR. Hence, CEDV has a considerable effect on GDP in the L&SR. It is evident that measures of tax revenue volatility used have mixed effects of RGDP. It is only PPTV, VATV and CEDV that have considerable effects on GDP in S&LR while CITV exerts inconsequential effect on RGDP in S&LR. Hence,

the study concluded that TR volatility had considerable effects on EG. It is advised that government should restructure the country's petroleum industry by stepping up efforts to process crude oil and solely exporting processed oil to the global market.

Keywords: Tax, Revenue, Volatility, Inconsequential Effect, Considerable Effects.

INTRODUCTION

The world over, tax adds to public monetary arrangement and advancement are essential. Taxes constitute the primary source of government revenue; in this way public economic policies are anchored on projected revenue from taxes. Therefore, the connection among tax collection and development in an economy has drawn in expanded exploration interest in advanced nations and there has all the earmarks of being a presumption in developing economies on what is applicable to these developed countries also applies to them (Etim, Austine & Nsima, 2020), Ehiedu & Toria (2021).

Nigeria's income from oil can presently don't completely uphold her turn of events and development targets because of the drastic decrease in cost of oil as of late which has prompted a lessening in the funds accessible to the Government, accordingly, there is need for the public authority to create sufficient income from inside sources has become a matter of extreme urgency and importance. This need highlights the enthusiasm with respect to government to search for new wellsprings of income or to get forceful and creative in the method of gathering income from existing sources. One of these current sources is tax collection (Arowoshegbe, et al, 2017) (Ehiedu and Obi ,2022).

Volatility of TR is an impression of changes of the overall income level of citizens, and the tragic hash financial environment of working together which influence the usefulness of organizations working in Nigeria. This coincidentally influences the economy's EG. Different investigations additionally considered volatility of TR in developing economies. These examinations may have added to decrease the mean level of public spending, and furthermore, dominant part of the increment in state tax volatility in the 2000's can be credited to lopsidedness in state charge structures, characterized as overweighting either sales or income taxes (Adegbe, et al, 2020) (Ehiedu and Ogbeta 2014), (Ehiedu, Odita & Kifordi, 2020).

TR may not be the main revenue wellspring of authority as far as the size of income logical from tax collection, notwithstanding, tax collection is the main revenue wellspring for the authority, according to the perspective of conviction and consistency qualities. The income tax is levied on incomes such as salaries, business profits, interest, dividends, commissions, royalties and rent. It might likewise be charged on capital increases and oil benefits. Tax collection yields exceptionally generous income to government. In this way, it has a bearing on the Gross Domestic Product (GDP) which is the standard pointer for estimating EG, (Ehiedu, Odita & Kifordu 2020), (Arowoshegbe, et al, 2017).

Governments of developed and developing countries are burdened with an essential part of guaranteeing a sensible expansion in the development of the economy over time (Edame and Okoi, 2014). The accomplishment of this commitment won't be without the formation of revenue through taxes. Then, tax rates instability is very much overseen by the public authority in causing the viability of economic arrangements in some given country; this legitimizes the association of assessment taxes and EG. Approaches by which taxes apply effects on EG were

depicted by (Edewusi and Ajayi, 2019), (Ehiedu, Onuorah and Okoh 2021). They kept up that tax rates imposed on companies, people and non-stock resources can block the level of investment. Once more, taxes can decelerate growth in labour supply by removing labour leisure choice in support of labour. Moreover, policies authorized concerning tax applies critical impact on R&D expenditure. Moreover, areas confronted with issues of low efficiency can be strengthened financially with the revenue generated through taxes (Ehiedu & Olannye 2014), (Edewusi & Ajayi, 2019).

Currently, revenue is assigned by the equation suggested by Ad-hoc Fiscal Commissions or dependent on a principle chosen by the state. As per Otu and Theophilus (2015), from 1946 to date, a sum of thirteen revenue allocation Commissions had been set up. Each Commission suggested a formula for income sharing relying upon the financial fortunes and purposes, which the public authority needed the revenues sharing recipe to serve. More so, the revenues are raised for the most part through tax assessment to back government use and to impact different activities in the economy. Likewise, tax revenue mobilization as a wellspring of financing formative activities in less developed economies has been a troublesome issue essentially as a result of different types of obstruction, like avoidance, evasion and other degenerate practices can undoubtedly be sustained inside the direct taxes bracket. These activities are considered as attacking the economy and are promptly introduced as purposes behind the underdevelopment of the country. Government gathers taxes to give a proficient and consistently growing non-income yielding services, like infrastructure, education, health, communications system, employment opportunities and essential public services like the maintenance of laws and order (Ofoegbu, David & Oliver, 2016).

Taxation is one technique to generate money for funding daily government operations. Governmental actions involve raising money and using it to fund the country's citizens' access to security, social services, infrastructure, etc. Based on this, it is important to recognize that taxation's goal and governmental functions are complementary (Akhor, 2014). Nevertheless, it has been noted over time that the Nigerian tax system has structural flaws. Nigerian tax system is concentrated on Petroleum Profit Tax (PPT) volatility and Company Income Tax (CIT) volatility while broad-based indirect taxes like the Value-Added Tax (VAT) volatility and Custom and Excise Duty (CEXD) volatility are neglected. Hence, the tax system lack capacity to vary the country's revenue portfolio in a way that would protect it from the volatility of oil prices and would also support fiscal sustainability and economic viability at lower levels of government.

In Nigeria, revenues have been doled out by the condition proposed by Ad-hoc Fiscal Commissions or dependent on a standard picked by the state. According to Otu and Theophilus (2015), from 1946 to date, an amount of thirteen revenue allocation Commissions had been set up. Each Commission recommended an equation for money sharing depending upon the financial fortunes and purposes, which the public authority required the incomes sharing formula to serve. Incomes are raised generally through tax assessment to back government use and to affect various activities in the economy. Again, TR mobilization as a wellspring of financing developmental activities in less developed economies has been an irksome issue basically because of various sorts of hindrance, similar to aversion, avoidance and other ruffian practices can without a doubt be supported inside the direct taxes bracket. These activities are considered as assaulting the economy and are expeditiously presented as purposes behind the

underdevelopment of the country. Government gathers taxes to give a capable and reliably developing non-pay yielding services, like infrastructure, education, health, communications system, employment opportunities and essential public services like the maintenance of laws and order (Ofoegbu, 2019).

The CIT or corporation tax started in 1961 in Nigeria is frequently charged on the assessable profit of organizations. The revenue made through this arrangement of assessment has been debilitating over the LR as organizations avoid the cycle since they see the duty to be segregating. Likewise, infant and new businesses additionally get reliefs until sensible benefit is accounted for. Onaolapo, Fasina and Adegbite (2013) the tax is condemned when organizations think of it as a punishment for progress without pay for disappointment. Additionally, the nation is blessed with other regular resources, for example, gaseous petrol, tin, iron metal, coal, limestone, lead, zinc and arable land (Nimenibo, Samuel, Eyo & Chika, 2018), (Ehiedu and Odita 2014).

Most economists analysts, especially development and worldwide financial experts have contended that over subject to the direct taxes revenue (e.g. PPT; because of the volatility in the oil cost and CIT; on account of the sharp practices like avoidance, evasion, and so forth, that are effortlessly executed) may antagonistically influence a country's EG and development (Okafor, 2012). The essential thought behind tax collection is to make sufficient income to expand the prosperity of individuals with a specific point of expanding the situation of the EG and development. Albeit turnaround, the economy of Nigeria has remained in a frightful state with macroeconomic pointers showing an economy kept from restoration, transformation and revival. This investigation gets basic attributable to the developing requirements of the country and the commitments of the public authority to improve EG and development in the general public just as worldwide and inter-temporal comparisons of nations.

Nigeria's economy has been in development, with her recent economic growth being uneven, unexpected, and unacceptably poor, especially when compared to certain other economies (Machi, 2011). As the largest oil exporter in Africa with an oil-dependent economy, the nation has seen numerous oil price disruptions following its volatility on the global market. There exist price fluctuations since the 1980s and the 1990s. Apart from the incessant price drop due to sudden outbreak of COVID-19, the recent notable one was the drastic fall from \$112 per barrel in 2014 to almost \$38 at the end of 2015 following incessant and massive supply of Shale oil to the global market (British Petroleum Statistical Review, 2017). The price fall, therefore, indicates a decrease in revenue and challenges in reaching a sustainable level of growth. The reason being that over 80 percent of the government revenue comes from oil export. The monolithic structure of the Nigerian economy has also been continually threatened by the volatility in prices as the country's oil exploration began in the 1970s. This has forced authority to accept the rising necessity for economic diversification from the oil economy to other sectors.

Also, trends from the world oil sell has shown fluctuating price levels identifying a future fall in crude demand with the full utilization of alternative source of energy such as electric and solar power cars. Determining the precise and unique contributions that each TR source contributes to the national GDP has thus become crucial, and the declining rate of TR creation in Nigeria makes it challenging to use taxes as a tool of fiscal policy to promote EG. Some governments like that of Canada, United States of America, Netherland, and The United

Kingdom have substantially influenced their economic growth through TR generated from CIT, VAT, Personal Income Tax, and Education Tax and have prospered through tax revenue (Arowoshegbe, et al, 2017).

Again, the attitude of Nigerians towards taxation is worrisome as many prefer not to pay tax. Thus, the unwillingness to pay tax (tax avoidance) as well as evading tax, the economy continues to lose huge amount of tax revenue. If this lost revenue is ploughed back into the economy and well utilized, can change the fortune of the nation. Now, this issue has persisted for so long in developing nations like Nigeria and calls for immediate attention and a fix. The cost of collecting taxes in Nigeria is so high that, if unchecked, it may soon exceed the benefit or value obtained from such operations, which would not be proper for the system as this unwholesome behaviour goes against the canon of administrative efficiency (Nimenibo, et al, 2018).

There are have studies conducted on the impact of TR volatility on economic growth in Nigeria, example are the study of Adegbe, et al (2020), their findings showed that TR volatility moderated by inflation rate and exchange rate had significant effect on economic growth in Nigeria, Ojutawo, et al (2020), findings revealed that PPT volatility had positive and significant effect on EG in Nigeria, Edewusi & Ajayi (2019), their findings showed that PPT and CIT has a significant influence on EG while VAT has insignificant influence on EG. Yahaya & Bakare (2018), the study discovered that that PPT and CIT have positive significant impact on GDP while CED has negative insignificant impact on GDP in Nigeria. Gwa & Kase (2018), their finding revealed that there is a significant contribution of CIT and VAT on the EG of Nigeria. The finding also revealed that there is no significant contribution of PPT on the growth of the Nigeria economy. According to Cornelius, Ogar, and Oka's (2016) research, PPT and economic expansion were significantly correlated, but CIT and economic expansion were not significantly correlated. Both CIT and value-added tax have a favourable effect on EG, according to the analysis of Lyndon and Paymaster (2016). Based on their 2016 research, Akhor and Ekundayo found that VAT significantly and negatively affected RGDP. In a similar vein, Salami, Apelogun, Omidiya, and Ojoye (2015) found that past exogenous variables (PPT, CIT, CED, and VAT) had a negative and weakly but considerable effect on RGDP, but that all of the exogenous variables (PPT, CIT, CED, and VAT) show a considerable effect on economics individually when tested on the EG. Different authors' findings are mixed and inclusive, thus provoking more research. Therefore, this research work explores the link between TR volatility and EG in Nigeria.

REVIEW OF RELATED LITERATURE

Concept of Taxation

Tax is a non-rebuffing yet obligatory exchange of assets from the private area to the public area and it typically forced on person's very own pay, partnerships and establishments without plan of action for guaranteed benefits for the duty paid (Ofishe, 2015). The idea is additionally alluded to as a necessary exchange of assets to the public authority from different frameworks (World Bank, 2000). Adeyeye (2004) maintained that tax is a liability on account of taxpayer as a reasonable contribution to the available fund required for use by government in providing necessary infrastructure for her citizens. In the interim, Miller and Oats (2006) depicted tax as the legally obligatory definable sum needed by a legitimate authority from the useful activities of an individual or corporate body for the arrangement of public labor and products. Angahar

and Sani (2012) confirmed that taxation is a fiscal policy tool used in controlling inflation. In inflationary times, government should increase direct tax there by straining away excess purchasing power. There should be selective indirect taxes to be employed in controlling inflation with the elasticity of the demand and supply of the commodities. Commodities with low demand elasticity and high supply elasticity will not increase inflation when taxation is increased. Commodities that are of necessities should be taxed lower, while luxuries should be highly taxed as this will reduce the inflationary.

Nzotta (2007) identified four key issues which must be understood for taxation to play its functions in any society. First, a tax is a compulsory contribution made by the citizens to the government and this contribution is for general common use. The second is that a tax places the tax payer under a general obligation. Thirdly, there is a presumption that the advantages gained may not equal the tax payer's contribution to public revenue. The government does not impose taxes on a citizen simply because it has provided him or his family with certain services. Thus, it is clear that a sound tax system is important for many reasons as a country develops economically, and Nigeria is no different (Appah, 2010).

Both direct and indirect taxes are possible. Direct taxation is made up of a variety of elements. These include personal income taxes, taxes on petroleum profits, corporate income taxes, and taxes on education. Value Added Tax, Custom and Excise Duty, and other significant indirect taxes are levied in Nigeria (Umoru and Anyiwe, 2013).

Tax Revenue

The studies in tax turned into revenue by Okwori and Sule (2016). Obiechina, (2010), Illyas and Siddiqi (2010), Chaudhry and Munir, (2010) defined Revenue as all amounts of money received by a government from external sources for example those originating from “outside the government” net of refunds and other rectifying transactions, money received from debt issuance, investments sold, agency or private trust transactions, and transfers within the government. Government's financial resources, which are derived from money earned or mobilised in the economy, make up the majority of its revenue (Obiechina, 2010). The working definition used in this study is consistent with (Garrido & Mittone, 2013; Soyode & Kajola, 2006), who hold the opinion that governments have choices for obtaining money to divert resources away from other economic sectors and from other claimants to carry out their operations. Hence, the government has access to additional ways of obtaining money to fund its operations excluding oil and non-oil sources of revenue.

Volatility of Tax

Volatility means the frequency and severity at which the market price of an investment fluctuates (Seegert, 2012). In general, volatility can be defined as the rate at which the price of securities rises or falls for a specific set of returns. By measuring the standard deviation of the annualized returns over a specific time period, volatility is determined. The range to which the price of an asset may rise or fall, as similarly noted by (Balding and Dauchy, 2013). To put it another way, volatility is a statistical indicator of the range of returns for a specific securities or market index. Volatility can either be measured by using the standard deviation or variance between returns from that same security or market index. The higher the volatility of firm revenue the riskier the security and investment of the firm and for the individuals as well. In the securities markets, volatility is often associated with big swings in either direction.

The discussions on taxes and volatility by Shambaugh (2012) and the crises on Europe as highlighted by Schaufele (2016) were centered on the resources of nations and the degree of volatility. It is referred to as a "volatile" market when the stock market fluctuates by more than 1% over an extended period of time. Volatility is the term used to describe the degree of risk or uncertainty associated with the magnitude of variations in a security's value. A security's value may be more evenly distributed throughout a wider range of values if its volatility is stronger. As a result, the security's price may see a sharp swing in either direction within a little period of time. A security's value will typically vary less and be steadier if its volatility is lower.

Economic growth (EG)

EG is defined as the long-term, steady increase in the net national product or per capita national product (Dwivedi, 2004). This implies that the rate of growth of the overall output must be larger than the rate of growth of the population. According to Igbasan (2017), another metric of economic growth is the proportion of the nation's gross domestic product that is made up of goods and services that a respectable number of people urgently require. The four key indicators of national resources, human resources, technological advancement, and capital formation, according to him, may all be used to measure economic progress.

A country's EG is officially defined as an increase in the value of the products and services it produces over time. Economists assess EG by looking at changes in a country's GDP. Thus, it is possible to have EG without economic development in the short or even medium term (Hadjimichael, Kemeny and Lanahan, 2014). In other words, there could be an increase in GDP without any increase in standard of living of people in a state. Environmental conditions that would enhance EG must be created through an investment of the national income in infrastructural development for subsequently improvement in the standard of life of the population of a country (Wilkins and Zarawski, 2014).

This can be achieved through the revenue generated through tax. Diffen (2015) emphasize the need for a new measure of progress in the well-being of people, arguing that GDP is not a good measure because EG is not synonymous with improved well-being. The author suggested that indicators promoting sustainable development should be used to replace GDP.

Benefits-received theory (BRT)

Cooper's (1994) opined that BRT of taxation, taxes should be levied against individuals in proportion to the benefits bestowed upon them. In practise, a "quid pro quo" is assumed to exist because the more benefits someone receives from state operations, the more they should pay to the state. However, because it is difficult to calculate the precise quantity of government benefits, particularly hazy advantages like military protection, that each resident and non-resident tax payer receives, it cannot be implemented.

This presupposes an exchange or contractual relationship between the state and the tax-payers; specific goods and services are provided by the state, and the cost of those goods and services is contributed in the proportion of the BRT; hence, the benefits received present the basis for dispersing the tax burden in a particular way. This idea ignores how the tax system may be used to stimulate or stabilize the economy (Chigbu, Akujuobi and Appah, 2012).

Due to the cost of service theory's resemblance to the BRT, it is pertinent to this study. The approach places more emphasis on citizens' semi-commercial ties with the state.

Ability to Pay Theory

Pigou's (1920) "ability to pay" argument contends that in order to cover the cost of government spending, each person should pay taxes in accordance with his or her capacity to pay. The philosophy of taxing based on one's ability to pay is also known as the principle of equity or justice in taxation. There should be "no quid pro quo" since higher earners should pay more taxes than lesser earners. The assessment of taxes based on an individual's taxable capacity seems more fair and acceptable. This theory's main flaw is how it defines what it means to be able to pay.

This theory of taxation promotes the progressive tax method, which believes that taxes should be assessed in accordance with a tax-capacity payer's to pay. According to this taxation system, people with greater incomes are required to pay higher taxes than people with lower incomes (Chigbu, et al, 2012).

This theory's fundamental tenet is that tax burden should be distributed among society's members in accordance with the principles of equity and justice, and that this principle requires that tax burden be distributed in accordance with their relative ability to pay; consequently, this theory is pertinent to this study.

Empirical Review

Inflation and exchange rates were used as moderating variables in an investigation by Ojutawo, Adegbe, and Salawu (2020), Onuorah, Ehiedu, & Okoh (2022), Obi, C.K. (2015), on the impact of PPT volatility on EG in Nigeria. The research design used in this study is ex post facto. Data were gathered from reputable sources, including the National Bureau of Statistics, the Central Bank of Nigeria Statistical Bulletin, and the Federal Inland Revenue Services, totaling 108 observations for the period 1981Q1-2017Q4. The relevant regulatory agencies examined the data for validity and dependability. Pre-estimation tests were run utilizing stationarity and Pearson correlation testing. There were four post-estimation tests: stability test, Breusch-Godfrey serial correlation lagrangian multiplier, heteroskedasticity, and linearity. Both descriptive and inferential statistics were applied to the data analysis. Results showed that Nigeria's EG was positively and significantly impacted by the volatility of the PPT. This study came to the conclusion that Nigeria's EG is impacted by the volatility of PPT's. The government should design tax laws that will support consistent TR, according to the recommendation. In addition, the government should oversee the wise use of tax money for infrastructure development that will lead to economic expansion. The effect of TR on the growth of the Nigerian economy was quantified by Uket, Wasiu, and Etim in 2020, Omojefe & Ehiedu (2017).

The study examined the effects of three TR streams—income tax from CIT, PPT, and VAT on economic development as measured by growth in the GDP from 1994 to 2018. With the aid of SPSS 20.0, the study used the OLS statistical technique and found that the TR streams under investigation were positively correlated with economic development, with a coefficient of determination of 99.2%. Additionally, despite the study's findings that taxes on CIT and the VAT have a significant impact on GDP growth, taxes on PPTs have a negligible or insignificant effect on GDP growth in Nigeria because of the Organization of Petroleum Exporting Countries' (OPEC) production ceiling on the country's production and sales as well as the decade-long spikes in crude oil prices around the world. The study also showed that there are

tax leakages caused by corruption and administrative inefficiencies on the part of the tax authorities, as well as apathy among tax payers against paying taxes.

According to Obi, C & Ifelunini, I (2019), Agbogun, and Ehiedu, (2022), Joseph and Omodero (2020), there is a connection between government revenue and Nigeria's economic expansion. The study uses exploratory and ex-post facto research techniques and secondary data from the Federal Inland Revenue Services (FIRS), National Bureau of Statistics, and CBN statistical bulletin covering the years 1981 to 2018. The OLS regression approach is used to examine the relationship. The outcome shows a moderately positive association between the growth of the economy and federal TR and VAT. The study gives evidence that the government must develop pertinent revenue policies that will increase government income in order to have a more positive impact on the EG, (Odita and Ehiedu & Kifordo, 2020).

With a particular focus on CIT, VAT, and PPT, Agunbiade and Idebi (2020) investigated the relationship between TR and EG in Nigeria throughout the 1981–2019 years. The National Bureau of Statistics (NBS) and Federal Inland Revenue Service were the data's primary sources (FIRS). The VECM was used in the study to determine the type and degree of the association between taxation and EG. The Johansen cointegration test demonstrates that there is at least one cointegrating equation between the variables over the long term. The Granger causality test revealed a causal link between RGDP and the various tax components. The findings that the VAT, CIT and PPT shocks have an ongoing effect on GDP growth over the stipulated time under discussion are supported by the impulse response functions and the variance decomposition analysis. According to variance decomposition research, the shock to direct taxes (CIT and PPT) likely to have little impact on GDP growth, whereas the shock to indirect taxes (VAT) tends to have a major, enduring impact. Therefore, this study advised that in order to increase TR, a broad base tax strategy should be implemented, concentrating on all significant components of the tax system with quantifiable results.

The long-term relationships between PPT, CIT, and EG in Nigeria from 1980 to 2018 were examined by Etim, Austine, and Nsima (2020), (Odita, Ehiedu and Kifordu 2020). The analytical methods used were the Augmented Dickey-Fuller (ADF) unit root-test, Engle Granger Procedure Co-integration test, Parsimonious Error Correction Mechanism (ECM), Durbin-Watson statistic, and over parameterized model, and the secondary data covered a 39-year span. The analysis's findings show that, when independent factors are integrated with the dependent variable at first order, the researched variables have positively significant relationships with the (0.9844) and (0.9471) co-efficient for petroleum profit tax and firms' income tax, respectively. Long-term relationships are indicated by this. Additionally, the sparse data indicate that the t-values of CIT and PPT on economic growth have positive co-efficients of (3.6344), (2.7644), and (2.7629). It was suggested that the government handle tax-related issues deftly in light of the findings in order to encourage more investments, inventions, and entrepreneurial endeavours. By enhancing our knowledge and comprehension of the relationship that exists between TR and EG, the study makes a contribution to the field of taxes and fiscal policy research.

In 2019, Edewusi and Ajayi looked at the relationship between TR and EG in Nigeria. The study specifically examined the effects of the PPT, CIT, and VAT on Nigeria's EG. It also examined the impact of other taxes on those same three areas. Time series data were acquired from the CBN and FIRS statistical bulletins using the ex-post facto research design. The study's

model included the GDP, PPT, CIT, and VAT among other factors. Data collected for these variables were examined using multiple regression analysis, co-integration, and other post estimation tests to determine the variables' immediate and long-term effects. According to study results, the PPT has a positive and significant influence on EG with a reported coefficient estimate of 3.707601 ($p=0.5150>0.05$), the CIT has a similar positive and significant influence with an estimated value of 55.79390 ($p=0.2580>0.05$), and the VAT was also found to have a noticeable and positive influence with a reported coefficient estimate of 16.04333 ($p=0.5150>0.05$). Following these findings, the study argued that the government should improve the country's tax system in order to stop behaviours that undermine its ability to raise the necessary funds to affect a change in the growth of the economy, as well as change the institutional setup to support a model for best practises among industries in the nation.

The impact of income tax collection on Nigeria's GDP-proxied EG was examined by Arowoshegbe, Uniamikogbo, and Aigienohuwa (2017). (GDP). Data were gathered from secondary sources, specifically the Federal Inland Revenue Service's and the Central Bank of Nigeria's statistical bulletins, for the years 1995 to 2015. Over the period of 1995 to 2015, the connection between GDP (the dependent variable) and a number of government income tax revenue headings was investigated using the Econometric Model of Multiple Linear Regressions and the OLS approach. According to our research, the tax receipts from the PPT and the CIT are what determine the government's EG. It follows that direct taxes—those that have a positive impact on EG—have a greater impact on Nigeria's EG than indirect taxes do. The oddity was ascribed to flaws in the income tax system, gaps in the tax code, and sluggish tax administration. It was suggested that in order to prevent taxpayers from evading and avoiding taxes, tax policymakers and governing bodies should enhance the legal and regulatory environment. In order to increase tax income collection in Nigeria, initiatives for improving the tax administration system should also be employed.

Lyndon and Paymaster (2016) used secondary time series panel data spanning the years 2005 to 2014 to analyse the effects of CIT and VAT on EG (measured as a proxy by RGDP) in Nigeria. The analysis's findings demonstrated that both CIT and VAT have favourable effects on economic expansion.

RESEARCH METHODOLOGY

The type of research design adopted in this study is the Ex-post facto and Quasi Experimental design. The ex-post facto research design is used because this type of research is one that takes place after the event or the fact had taken place while Quasi Experimental design is adopted because seeks to explore the causal effect of tax revenue volatility on economic growth in Nigeria.

Secondary source of data was used in this study because it will enable us to obtain data for the different measures of tax revenue volatility relating to economic growth (Gross Domestic Product (GDP)).

Unit root test was used to test whether or not data series are stable (i.e. if its mean and variance are time invariant and the auto-covariance does not depend on time but depends on the time lag between the variables the ARDL bound cointegration test allow to model both I(0) and I(1) variables together. More so, once the ARDL bound cointegration test affirms that there is no cointegration between the study variables, the next step is to test for ARDL Co-integrating and long run form. The ARDL Co-integrating will be targeting at examining whether the

cointegrated variables was influenced by the extent of any deviation from long-run equilibrium or not. The model of this study was adopted from the work of Adegbe, Salawu and Ojutawo (2020) because it contain some of the independent and dependent variables under study and it suits perfect into the type of analysis that will be used to analyze the data of the study. The functional estimation used to achieve the assumptions stated earlier is,

$$Y = f(X) \dots \dots \dots (1)$$

This denotes that Y= Dependent Variable, which is GDP (Gross Domestic product used to measure EG). While X = Independent Variable, proxy as TR Volatility (TRV)

The long-run volatility model in algebraic form is presented below as,

$$LGDP = \beta_0 + \beta_1TRV + \beta_2INFR + \beta_3EXR + U \dots \dots \dots (2)$$

This model was restated to suit the variables of this study by adopting ARDL Model. The EG (proxy with Gross Domestic Product (GDP)) and TR volatility was proxied with {Petroleum Profit Tax Volatility (PPTV), Value Added Tax Volatility (VATV), Company Income Tax Volatility (CITV) and Custom and Excise Duties Volatility (CEDV)) as well as data relating to economic growth (Gross Domestic Product (GDP)) are the independent variables. The modified model was subjected to Autoregressive Distributive Lag (ARDL) in order to suit the feature of stationarity of the study variables. The ARDL was specified as:

$$\begin{aligned} \Delta GDP = & \partial_0 + \partial_1 GDP + \partial_2 PPTV_{t-1} + \partial_3 VATV_{t-1} + \partial_4 CITV_{t-1} + \partial_5 CEDV_{t-1} \\ & + \sum_{i=1}^k \gamma_1 i \Delta GDP_{t-1} + \sum_{i=1}^k \gamma_2 i \Delta PPTV_{t-1} + \sum_{i=1}^k \gamma_3 i \Delta VATV_{t-1} \\ & + \sum_{i=1}^k \gamma_4 i \Delta CITV_{t-1} + \sum_{i=1}^k \gamma_5 i \Delta CEDV_{t-1} + \varepsilon_t \dots \dots \dots 2 \end{aligned}$$

K = lag length for the Unrestricted Error-Correction Model (UECM)

Δ = first differencing operator

ε = white noise or disturbance error term

The co-integrating long-run relationship will estimated using the specification below:

$$\begin{aligned} \Delta GDP = & \partial_0 + \partial_1 GDP_{t-1} + \partial_2 PPTV_{t-1} + \partial_3 VATV_{t-1} + \partial_4 CITV_{t-1} + \partial_5 CEDV_{t-1} \\ & + \varepsilon_t \dots \dots \dots 3 \end{aligned}$$

The short-run dynamic model is specify thus:

$$\begin{aligned} \Delta GDP = & \sum_{i=1}^k \gamma_1 i \Delta GDP_{t-1} + \sum_{i=1}^k \gamma_2 i \Delta PPTV_{t-1} + \sum_{i=1}^k \gamma_3 i \Delta VATV_{t-1} + \sum_{i=1}^k \gamma_4 i \Delta CITV_{t-1} \\ & + \sum_{i=1}^k \gamma_5 i \Delta CEDV_{t-1} + \varepsilon_{Ct} \dots \dots \dots 4 \end{aligned}$$

Where;

ε_{C,t-1}= the error correction term lagged for one period,

γ = the coefficient for measuring speed of adjustment in equation.

RESULT AND DISCUSSIONS

Summary Statistics

The summary statistics accounts for the mean, minimum, maximum value, and standard deviation value for the measures of TR volatility, namely; PPTV, VATV, CITV and CEDV while EG proxied with GDP. The result is presented below:

Table 1
Summary Statistics

	GDP	PPTV	VATV	CITV	CEDV
Mean	54359.09	9894.073	3829.231	3483.661	6487.417
Median	37315.08	1853.150	679.8500	774.5500	303.3500
Maximum	163764.6	76667.00	34000.00	26000.00	63000.00
Minimum	1768.791	66.00000	36.90000	33.30000	57.70000
Std. Dev.	51867.07	20758.19	9036.838	7367.155	16722.20
Observations	28	28	28	28	28

Source: Econometric Views Version 9.0 Output (2022)

Firstly, GDP reported an average and standard deviation value of 54359.09 and 51867.07 suggesting that GDP has recorded a slow growth over the years since the standard deviation value is greater than the mean value. Meanwhile, GDP reported had minimum and maximum values of 1768.79 and 163764.6 respectively throughout the study periods. Further, PPTV reported an average and standard deviation values of 9894.07 and 20758.19 suggesting that PPTV has recorded a slow growth over the years since the standard deviation value is greater than the mean value. Meanwhile, PPTV reported had a minimum and maximum value of 66.0000 and 7667.00 respectively throughout the study periods. A way further, VATV reported an average and standard deviation value of 3829.23 and 9036.84 suggesting that VATV has recorded a slow growth over the years since the standard deviation value is greater than the mean value. Meanwhile, VATV reported had a minimum and maximum value of 3400.00 and 679.85 respectively throughout the study periods. Also, CITV reported an average and standard deviation value of 3483.66 and 7367.16 suggesting that CITV deviate much away from the mean value. Meanwhile, CITV reported had a minimum and maximum value of 33.3000 and 26000.00 respectively throughout the study periods. Lastly, evidenced that CEDV reported an average and standard deviation value of 6487.42 and 16722.20 suggesting that standard deviation is lower the mean value, which implies that CEDV has been has rising over the years. Meanwhile, CEDV reported had a minimum and maximum value of 57.7000 and 63000.00 respectively throughout the study periods.

Table 2
Correlation Matrix for the Independent and Dependent Variables

	GDP	PPTV	VATV	CITV	CEDV
GDP	1.000000				
PPTV	-0.363635	1.000000			
VATV	-0.314784	0.963890	1.000000		
CITV	-0.335966	0.970391	0.973690	1.000000	
CEDV	-0.365867	0.975614	0.996486	0.981383	1.000000

Source: Econometric Views Version 9.0 Output (2022)

The correlation matrix reported in table 4.3 above revealed that PPTV, VATV, CITV and CEDV exerted negative correlation with GDP in Nigeria. Furthermore, CEDV reported a coefficient value of -0.3659 suggesting that the correlation between CEDV and GDP in Nigeria and is high, though is negative. Meanwhile, the rest study variable reported slightly lower correlation. Generally, the result from the table shows that problem of multi-collinearity is not anticipated. Though, a further test will be carried out to ascertain this condition.

Table 3
Multi-Collinearity Test

Variables	Variance Inflation Factor	Tolerance Value
GDP(-1)	0.000384	4.170422
PPTV	0.048646	9.232324
VATV	4.128959	6.341670

CITV	0.171760	4.295985
CEDV	0.939961	7.256806
GDP(-1)	0.000384	4.170422

Source: Econometric Views Version 9.0 Output (2022)

From the above table, the tolerance level of variance in the predictor variables; PPTV, VATV, CITV and CEDV are not predicted by other predictors' variable. This is because their tolerance values are higher than 0.10 meanwhile the Variance inflation factor are less than 10. This shows the absence of multi-collinearity problem.

Table 4
Breusch-Godfrey Serial Correlation LM Test

F-statistic	0.037044	Prob. F(2,19)	0.9637
Obs*R-squared	0.104873	Prob. Chi-Square(2)	0.9489

Source: E-VIEW, 9.0 Outputs, 2022.

Prior to estimating the models, residuals of the variables were ascertained to check for the presence of serial correlation. This was done using the serial correlation LM test. The serial correlation LM test in Table 4.5a details that there is no element of serial correlation in the models owing to the fact that the p-values of the f-statistics are insignificant at 5% level of significance.

Table 5
Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.137392	Prob. F(5,21)	0.9817
Obs*R-squared	0.855259	Prob. Chi-Square(5)	0.9734
Scaled explained SS	1.207725	Prob. Chi-Square(5)	0.9441

Source: E-VIEW, 9.0 Outputs, 2022.

The P-value of the chi-square stood at 0.8076. This gives us prove that there is absence of Heteroskedasticity in the study, since it is not significant at 5%. Thus, the null hypothesis that states that the residuals have no constant variance and zero mean is rejected. On this note, we can boldly state the model is reliable and fit for prediction.

Table 6
Ramsey Reset Test

Equation: UNTITLED
Specification: GDP GDP(-1) PPTV VATV CITV CEDV C
Omitted Variables: Squares of fitted values

	Value	Df	Probability
t-statistic	0.121457	20	0.9045
F-statistic	0.014752	(1, 20)	0.9045

The Ramsey reset test indicated f-statistics probability of 0.9045 is greater than 0.05, this indicates that the ARDL model is well specified and suitable for further analysis.

Table 7
Summary of ADF Test

ADF test at Levels				
Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
GDP	-6.724809	-2.976263	0.0000	Stationary
PPTV	-2.313471	-2.976263	0.1751	Non-stationary
VATV	-3.028776	-2.981038	0.0453	Stationary
CITV	-2.182124	-2.976263	0.2168	Non-stationary

Parameter	ADF test statistic	Test critical value @ 5%	Prob.*	Decision
CEDV	-2.206801	-2.976263	0.2085	Non-stationary
ADF test at 1st Difference				
GDP	-3.853714	-2.981038	0.0477	Stationary
PPTV	-6.058372	-2.986225	0.0000	Stationary
VATV	-5.576783	-2.991878	0.0001	Stationary
CITV	-4.432493	-2.991878	0.0020	Stationary
CEDV	-5.184481	-2.981038	0.0003	Stationary

Source: Econometric Views Version 9.0 (2022)

The table above shows the order of integration (stationarity) of the series used for the study. All series were subjected to the ADF test and results indicate that all series except GDP, CITV and CEDV were found to be stationary at levels. However, when subjected further; PPTV, VATV, CITV, CEDV, GDP attained stationarity at first difference. This therefore indicates that all series attained stationarity at level and first differencing. Since our series were found to be stationary at levels (1(0) and first differencing (1(1) justify the need to examine the long run relationship between tax revenue volatility and GDP in Nigeria

Table 8

ARDL Bounds Test

Date: 09/25/22 Time: 11:13

Sample: 1995 2021

Included observations: 27

Null Hypothesis: No long-run relationships exist

Test Statistic	Value	K
F-statistic	8.826151	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

Source: Econometric Views Version 9.0 Output (2022)

From the Table 4.7 above, it can be observed that the value of the F-statistic 8.8262 is greater than the 5% critical values at I(0) and I(1) bounds; therefore we reject the null hypothesis and conclude that a long run relationship exist amongst the variables. Therefore, long run relationship exists between tax revenue volatility and GDP in Nigeria.

Table 9

ARDL Cointegrating and Long Run Form

Dependent Variable: GDP

Selected Model: ARDL(1, 0, 0, 0, 0)

Date: 09/25/22 Time: 11:11

Sample: 1994 2021

Included observations: 27

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PPTV)	0.636006	0.220559	2.883606	0.0089
D(VATV)	-6.116058	2.031984	-3.0098950	0.0067
D(CITV)	0.569678	0.414439	1.374576	0.1838

D(CEDV)	2.334999	0.969516	2.408418	0.0253
CointEq(-1)	0.115614	0.019584	5.903370	0.0000
$\text{Cointeq} = \text{GDP} - (-5.5011 * \text{PPTV} + 52.9009 * \text{VATV} - 4.9274 * \text{CITV} - 20.1966 * \text{CEDV} - 11958.4037)$				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
PPTV	-5.501135	1.758694	-3.1279660	0.0051
VATV	52.900851	11.239069	4.706871	0.0001
CITV	-4.927431	3.631056	-1.3570240	0.1892
CEDV	-20.196576	5.756649	-3.5083910	0.0021
C	-11958.403701	8778.369746	-1.3622580	0.1876
Durbin-Watson stat	1.867493	1.867493		

Source: Econometric Views Version 9.0 Output (2022)

The Error Correction coefficient (cointEq-1) is estimated at 0.1156; this means that the model corrects its previous periods disequilibrium at a speed of 11.56% estimated annually. In other words, increasing the tax revenue volatility variables at a steady state of 11.56% annually, the tax revenue volatility variables will improve significantly in the long run. Again, the Durbin Watson Statistics (1.8675), showed the model is not serially correlated since its value is within the accepted region of acceptance.

PPTV and GDP in Nigeria

Table 4.8 above clearly evidenced that a unit rise in PPTV will increase GDP by 0.6360(63.60%) in the short run but reduce GDP in Nigeria by -5.5011 (550.11%) on the LR. This shows that, the more the country volatility in form of PPTV; it has the likelihood of affecting the GDP positively and negatively in Nigeria. For statistical significance, PPTV pass the test of statistical significance on the S&LR. This agrees with Ojutawo, Adegbe and Salawu (2020) but contrary to Uket, Wasiu and Etim (2020).

VATV and GDP in Nigeria

The study affirmed that VATV exerted negative and positive significant effect on GDP on the short run and long run respectively. The implication of the negative and positive result is that 1% rise in VATV will decrease GDP by -6.1161 (611.61%) in SR but increases by 52.9008(5290.08%) on the LR. Put differently, the more the country experience VATV; it may be unfavourable in the short run but favourable on the LR. However, in terms of statistical significant relationship, VATV has a significant enough at the moment to influence GDP. Hence, VATV exert significant effects on GDP in S&LR. This result is in line with the findings of Uket, Wasiu and Etim (2020) but contrary to the findings of Adegbe, Nwaobia and Osinowo (2020).

CITV and GDP

Table 4.8 above clearly evidenced that a unit rise in CITV will increase GDP by 0.5697 (56.97%) on the SR and decrease in by -4.9274 on the LR. This further revealed that, CITV has strong effects on GDP in the S&LR; it has the likelihood of affecting the GDP in Nigeria. In terms of statistical significance, CITV did not passed the test of statistical significance at both S&LR. This implies that CITV is a strong effect on GDP in the S&LR, but the effect is not significant. This finding agrees with Ojong, Ogar and Oka (2016) but denies the findings of Joseph and Omodero (2020).

CEDV and GDP in Nigeria

The study affirmed that CEDV exerted positive and negative insignificant effect on GDP on the S&LR respectively. The allusion from positive and negative result is that 1% rise in CEDV will increase GDP by 2.3350 (233.50%) in SR but decreases by -20.1966 (2019.66%) on the long run. Put differently, the more the country CEDV increases; it may be favourable in the short run but unfavourable on the long run. However, in terms of statistical significant relationship, CEDV are significant enough at the moment to influence GDP. Hence, we conclude that CEDV exert significant effects on GDP in S&LR. This result is in line with the findings of Joseph and Omodero (2020) but contrary to the findings of Adegbe, Nwaobia and Osinowo (2020).

Summary of Findings

Based on the findings in the previous section, it showed that:

1. PPTV has a p-value of 0.0089 and a p-value of 0.0051 on the S&LR respectively. This implies that PPTV had a significant effect on GDP in Nigeria on the short run and long run.
2. VATV has a p-value of 0.0067 and 0.0001 both on the S&LR. This implies that VATV had a significant effect on GDP in Nigeria on both on the short run and long run.
3. CITV it has a p-value of 0.1838 and a p-value of 0.1892 on the S&LR respectively. This implies that CITV had an insignificant effect on GDP in Nigeria on the short run and long run.
4. CEDV has p-values of 0.0253 and 0.0021 both on the short and long run. This implies that CEDV has a significant effect on GDP in Nigeria on both on the S&LR.

CONCLUSION AND RECOMMENDATIONS

It evident that measures of TR volatility used has mixed effects of RGDP in Nigeria. It only PPTV, VATV and CEDV that has significant effects on GDP in Nigeria in both short and long run while CITV exerts insignificants on RGDP in both S&LR. Hence, the study concluded that TR volatility had significant effects on economic growth. Based on the findings, the following was recommended: It is advised that the Nigerian government restructure the country's petroleum industry by stepping up efforts to process crude oil and solely exporting processed oil to the global market. Secondly, there should be more transparency by the government on the management and utilization of tax resources in order to give tax payers greater assurance of its application. This will counteract the current effect of external shocks resulting from price fluctuation of crude oil due to OPEC quota restrictions or gloat or financial crises in the international market. By preventing leaks in tax revenue collection and broadening the country's tax base to draw in more tax income, Nigeria's tax administrative administration efficiency should also be improved. Thirdly, Policy of the government should understand that tax to GDP is put at 6% which is considered low for the nation. It is obvious that total tax revenue should be addressed through tax processes and procedures of tax assessment should be made more simplified and friendly at both e-transaction and human interface levels. This will create effectiveness and efficiency in tax administration that will increase our revenue base to melt out volatility. Finally, a process and procedure similar to the one engaged under Voluntary Assets and Income Declaration Scheme is equally laudable. No back duty investigation, no litigation, no court cases, no penalties and no fines. Future research work could examine the moderating effect of tax compliance costs on the relationship between TR volatility and EG.

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