Non-Oil Revenue Buoyancy and Elasticity: Implications for Revenue Generation in Nigeria

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Abstract

The paper employs annual time series data on real government tax revenue components from 1981-2014 to endogenously determine the level of non-oil revenue buoyancy and elasticity and its implication for revenue generation in Nigeria. A partitioning approach to determining tax buoyancy and elasticity is employed to address these objectives. The study found that with the exception of the Company Income Tax, an inelastic tax structure exists in Nigeria for the period under review. The proxy bases had similar results in terms of their responsiveness to the tax system. There were also evidences that the discretionary measures taken during the study period were not effective as shown in the low discrepancies between the buoyancy and elasticity measures. Among others, we recommend that government should as a matter of urgency strengthen tax administration and curtail leakages associated with tax avoidance and evasion. In addition, there is need for stronger collaboration among the relevant fiscal authorities and to streamline the tax structure and rates, reduce tax waivers and bureaucratic bottlenecks in the tax administration.

Keywords: Revenue buoyancy, Revenue elasticity, Revenue generation, Revenue base

JEL Classification: E62, H68, H21, H27

I. Introduction

The rebasing exercise of Nigeria's GDP in 2010 put the size of the economy at about ₦80.0 trillion, making it the biggest economy in Africa and 26th in the world. The rebasing captured the structural changes in the economy especially in sectors such as banking, telecommunications and entertainment where Nigeria has recorded dramatic growth over the years. However, Nigeria is still dependent to a large extent on oil based revenues, accounting for 67.5 per cent of total government revenue at end-December 2014 (CBN, 2014).

The overdependence on oil and related products for revenue has exposed Nigeria to the boom-bust cycle of international oil price volatility. Consequently, Nigeria's public finance management for most of the period after the

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1970's, has been largely driven by fluctuations in the international oil market and prices. These had resulted in the co-movements of government revenue and crude oil prices. Thus, government revenue increased astronomically in periods of high oil prices and contracted sharply during periods of price slumps. The current negative oil shock, for instance, has brought about a substantial reduction in Nigeria's foreign exchange earnings and revenue. This reinforces the need for diversification of the export and revenue base by focusing on non-oil alternative sources of revenue generation and export earnings. One veritable and fairly predictable alternative source of revenue for the government is tax from non-oil sources. Taxation affords the government greater latitude for effective and efficient fiscal management with a greater amount of certainty.

Total non-oil revenue to GDP ratio declined substantially following the rebasing of the GDP in Nigeria from about 6.7 per cent in 2009 to 3.3 per cent in 2013, revealing the decline of non-tax revenue in Nigeria. Relative to other countries, including Brazil 35.3 per cent, Russia 28.7 per cent, UK 35.2 per cent, US 24.3 per cent, South Africa 25.8 per cent, Kenya 20.1 per cent, Mali 14.5 per cent, and Ghana 17.1 per cent (Heritage Foundation, 2015). This therefore, underscores the need to aggressively improve on the low collection of non-oil tax revenues in Nigeria.

Non-oil tax revenues in Nigeria are collected by all tiers of government. However, different assignments and responsibilities are constitutionally allocated to the federal, state and local government levels. These tiers of government are usually expected to enact laws and formulate policies within the provisions of the Constitution that empower them or their agents to administer taxes most efficiently. The jurisdiction of the Federal government in terms of revenue collection include; Company Income Tax (CIT), Petroleum Profit Tax (PIT), Value Added Tax (VAT), Education Tax, Capital Gains Tax on corporates and the Federal Capital (FCT) residents, stamp duties and with-holding tax on corporates, royalties, customs/excise duties as well as Personal Income Tax on personnel of the armed forces, the Police, and residents of the FCT. The constitution empowers state governments to collect varying revenue from PIT, capital gains tax and stamp duties on residents of their respective states, vehicle licenses, development levy, street name registration fees, right of occupancy fees, market fees, etc. The Local govemment's tax jurisdiction includes tenements and shops/kiosk rate, liquor licenses, marriage/birth/death registration; local governments' park fees, domestic animal license fees, vehicle fees, public convenience, signboards and other advertisement permit fees.

Arising from the current oil shock is the imperative for government to resort to more internal and external financing. But government is also mindful of the need to avoid huge deficits and excessive growth in public debt. This can be achieved by increasing internal tax revenues through discretionary changes in tax related revenue and improving on tax administration and collection. Such changes should ideally be reflected in a tax system which automatically yields more tax revenues. Empirical evidences (Ahmed and Muhammed, 1997, 2010; Joumard and Andre, 2008; Cotton, 2012; Belinga et al., 2014) have shown that one of the ways of certifying that revenue is responding to changes in GDP is by measuring revenue buoyancy and elasticity.

This study, seeks to evaluate the efficiency of the tax system in Nigeria by testing for revenue buoyancy and elasticity for non-oil taxes, thus, the question, "Do non-oil tax revenue rise at the same pace as increases in the GDP?" Both the traditional and partitioning approaches to estimate the tax revenue buoyancy and elasticity for the period 1981-2014, is used with annual time series data for Nigeria.

In consideration of the urgent need to raise the non-oil revenue in Nigeria, this paper will be a useful analytical tool to policy makers and academia to further explain the overall structure of the tax system and design a more efficient and effective tax administration system that will respond to changes in the tax bases. The rest of the study is structured as follows: Section 2 is the literature review which outlines the concept of revenue buoyancy and elasticity, some theoretical issues and empirical literature on the subject. Section 3 looks at the structure and trends in tax and non-tax-revenue, while Section 4 analyses the buoyancy and elasticity ratios for Nigeria's non-oil revenue sources. Section 5 provides conclusion and proffers policy recommendations.

II. Literature Review

II.1 Conceptual Clarifications

II.1.1 Revenue Buoyancy

Revenue buoyancy is defined as a measure of the total response of changes in revenue represented by the changes in total GDP or any other component of the GDP such as consumption, investment, imports and exports. It is a measure of both the soundness of the tax bases and the effectiveness of tax changes in terms of revenue collection. A buoyant tax has a tendency to yield more revenue with the growth of its base. Komolafe, Jalilian and Hiley (1999) define buoyancy of a tax as the increase in the revenue collected compared with the relative increase in the GDP (tax base). The change in revenue encompasses any effects of changes in the tax system, including discretionary changes in the tax structure.

In this study, considering that Nigeria has two components of revenue namely, oil and non-oil revenue, our focus is on the non-oil revenue buoyancy as the ratio of the rate of change in non-oil revenue due to the rate of change in their respective bases (Upender, 2008). The revenue in this case is disaggregated into tax and non-tax, while the base is the nominal GDP (Jonathan, 1998). However, the tax revenue is further disaggregated into the various components such as non-oil taxes: VAT, import duties, excise tax, and company income tax (CIT). Tax buoyancy is defined by Pike and Savage (1998) as:

$$E_{TY}^{b} = \frac{\Delta T^{b}}{\Delta Y} * \frac{Y}{T^{b}}$$

Where:

E_{TY}^{b} =Buoyancy of tax revenue to income

T^{b} =Total tax revenue

ΔT^{b} =Change in total tax revenue

Y =Income

ΔY =Change in income

II.1.2 Revenue Elasticity

Tax elasticity reflects only the responsiveness of tax revenue to a unit change in the tax base. Thus tax elasticity reflects how different taxes respond to their tax bases without considering discretionary tax policies. The tax elasticity coefficient provides a good indication of the effectiveness of tax administration in understanding the impact of growth in revenue. Thus, tax elasticity is defined as the ratio of the percentage change in tax revenue to the percentage change in income (nominal GDP) or any of the components assuming that no discretionary changes have been made to the tax rate or tax base. This differs from the concept of tax buoyancy which refers to changes in actual tax revenues due to the changes in income as well as changes in discretionary measures such as tax rates and tax bases (Timsina, 2007). When there are no changes in the discretionary measures during the period reviewed, tax buoyancy and elasticity are the same.

Tax elasticity is thus defined as:

$$E_{TY} = \frac{\%\Delta T}{\%\Delta Y}$$

Where:

E_{TY} =Elasticity of tax revenue to income or GDP

ΔT =Change in tax revenue, and

ΔY =Change in income GDP

This means that an elastic tax system is a desirable system because it provides government with a good platform for increasing revenue. However, an inelastic system is undesirable, as it calls for a lot of discretionary policies to raise adequate revenue. An elastic tax system is one in which the rate of response of revenue to the changes in the tax base or tax rate is positive or greater than one. When the changes in the tax system elicit a decrease in the revenue, then the tax is inelastic. Unity elasticity occurs when a change in the tax base or tax rate yields an equal change in the revenue.

II.1.3 Revenue Base

Revenue buoyancy and elasticity as defined earlier recognise the existence of a revenue base. The revenue base is the major source of the total revenue of a country. In terms of the public sector, the most widely recognised revenue base used in understanding the impact of growth in revenue is the Gross Domestic Product (GDP). The GDP represents the total productian of the final goods and services produced in the economy. GDP is defined in terms of residency, and therefore there is no regard for the nationality of the owner of the production factors within the country. This is defined as GDP= private consumption (C) + government expenditure (G) + private investment (I)+ exports (X) – imports (M) (i.e. GDP= C+G+I+X-M)

The real GDP can be decomposed into its components which can serve as the base of the tax and non-tax revenue, for instance, VAT buoyancy and elasticity can be related to real consumption, while import duty buoyancy or elasticity can be related to changes in real imports and so on.

II.1.3.1 Types of Non-Oil Taxes and their Specific Bases

An important aspect of any tax system in relation to its productivity is the responsiveness of the tax revenue to changes in the nation's estimated gross domestic product. The starting point in situating revenue buoyancy and elasticity is on explanations of what constitutes the base (Pike and Savage, 1993). The major determinant of tax buoyancy is GDP growth rate. However, some scholars favoured the use of per capita Income as a true reflection of changes in income (Chelliah and Sheetal, 1974; Bahl, 1971 and Ansari, 1982). Others contend that some Human Development Indicators (HDI) would suffice. Not-

withstanding, this paper adopts the use of GDP which seems to be the consensus. Table 1 shows the relevant base for non-oil revenue in Nigeria.

Table 1: Revenue Sources and their Base

Revenue Source	Revenue Base	GDP Component
Non-Oil Sources		
a. Non-Tax		
i. FGN Independent Revenue	MDA's , licenses, fees	Non-Oil GDP
b. Tax		
Customs Duty	Imports	Imports
Corporate Income Tax	Profits of Companies	Private Investment/Proxy
Value Added Tax	Consumption	Consumption
Education Tax	Same as for Corporate tax	Private Investment/Proxy

Source: Author's compilation.

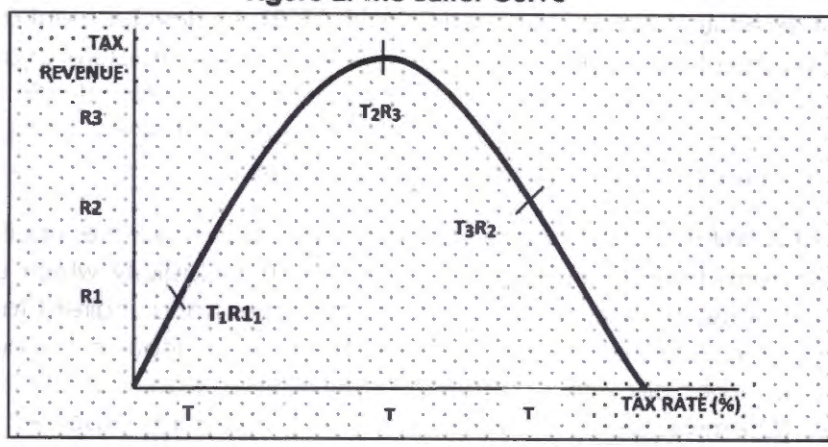
From the table, the non-oil revenue is broken down into tax and non-tax revenue. The non-tax is comprised of FGN independent revenue largely collected by ministries and agencies, operating surplus and dividends. The base of these non-tax revenue sources is the non-oil GDP. However, the focus of this study is on federally collected tax revenues which include customs duties, corporate tax; value added tax and education tax. The base of import duty is imports which is a component of GDP. The practical derivation of the tax buoyancy and elasticity for corporate tax uses the profit of companies, a component of GDP by income approach. Nonetheless, in the absence of profit component of GDP by income approach, private investment was used as a proxy. The same is true of the education tax which is a 2.0 per cent charge on companies' profits for education. The VAT is based on consumption as contained in the GDP.

II.2 Theoretical Literature

According to Arthur Laffer theory on taxation, popularly called the "Laffer Curve", government tax revenue tends to increase in tandem with the tax base when tax levy is increased. However, beyond a certain level of tax rate the optimal tax revenue begins to decline, because further increase in the tax rate brings about disincentive for more hours of work. When tax rates eventually reach 100 per cent (the far right of the curve), there is no longer incentive for a rational tax payer to earn any income, thus, the revenue raised at 100 per cent is not different from taxes raised at zero per cent. One potential result of this theory is that increasing tax rate beyond a certain point will be-

come counterproductive for raising further tax revenue because of diminishing returns (Laffer, 2004).

Figure 2: The Laffer Curve



Drawing from the Laffer curve, tax rate setting has both the arithmetic and economic effects. According to the arithmetic effect, tax revenue reduces by the same amount of the reduction in the rate once taxes are lowered and the converse happens once the tax rates are increased. From the graph above, when tax rate is increased from T_1 to T_2, government revenue increased from R_1 to R_3 and meets at point T_2R_3. However, a further increase in tax rate from T_2 to T_3 led to a downward movement on the curve from T_2R_3 to T_3R_2, implying a fall in government revenue from R_3 to R_2. It therefore appears that T_2 is the optimal tax level beyond which government fiscal policy becomes ineffective. This is because beyond that level, the intended outcome of buoyant revenue becomes depressed.

As noted by Laffer (2004), the economic effect recognises the positive impact that lower tax rate has on work, output, and employment - and thereby the tax base - by providing incentives to increase these activities, whereas raising tax rates has the opposite economic effect by penalising participation in the toxed activities. From the graph, we can deduce that the drop in revenue from R_3 to R_2 when the tax increase was due to the lack of interest to participate in tax activities or the disincentive to more work. However, prior to the optimal tax rate (T_2), government revenue increased despite rising tax. Thus, when the two effects are combined, the impact of the change in tax rate on total tax revenue becomes insignificant. This situation is defined as the concept of deadweight loss in taxation and the policy option for returning efficiency remains lowering of taxes and expanding tax base (Stiglitz, 2000).

However, tax structure is related to the stage of economic development in any country. Consequently, tax buoyancy and elasticity are affected or de-

termined by the level of economic activity. Thus, in the early stage of economic development of a country, the tax administration and structure is characterised by low tax revenue/GDP ratio as a result of narrowness in the tax bases. Indirect taxes from foreign trade remained the veritable source of government revenue (Osemwengie and Oriakhi, 2013). As development advances and structural reforms take place, however, the tax structure changes in favour of income related taxes leading to decline in foreign trade related taxes. At this stage, the relevant taxes are personal income tax, company income tax, among others (Wilford and Wilford, 1978).

Wilford and Wilford (1978) noted that direct revenues have the inbuilt significant long-term flexibility in terms of buoyancy and elasticity which enables them to increase as income increases. On the other hand, indirect taxes become inelastic as the economy progresses because changes in the economic structure, especially with increased industrialisation, lead to a shift in import activities (Osemwengie and Oriakhi, 2013). It is therefore, expected that in terms of productivity in on economy, more revenue is expected to be derived from direct taxes such as Personal Income Tax (PIT) and Company Income Tax (CIT).

II.3 Empirical Literature

Numerous studies have been conducted by scholars on the issue of revenue buoyancy and elasticities, though, with different outcomes and conclusions. Ahmed (1994) studied the determinants of tax buoyancy in 34 developing countries in a comparative analysis of the fiscal efforts of the selected countries. First, the tax buoyancy for each country was estimated using the ratio of the change in total revenue to income. Adopting the linear Ordinary Least Squares (OLS) estimation method, the study regressed the output of the buoyancy for each country on specific categories of tax. The results were two fold – direct and indirect taxes. Direct taxes were responsive to growth in the industrial sector, monetisation (proxied by money supply), imports and growth in GDP. The outcomes of the result on indirect taxes were similar. Indirect taxes similarly responded to growth in the industrial sector, monetisation, imports, and growth in fiscal deficit.

Ahmed and Muhammed (1997) found that import tax alongside sales taxes were very buoyant at least for the economy of Pakistan. The study covered a period of 18 years from 1973-1990 and was focused on tax elasticity and buoyancy as well as their relationship to expenditure. A log-log linear model (double log model) was formulated relating tax collection to Gross Domestic Product (GDP) to aid the estimation of buoyancy coefficient parameters,

while the Prest formula was used in estimating elasticity co-efficients. The study found that on aggregate, tax buoyancy and elasticity were low. However, on a disaggregated level, import duty and sales taxes were found to be buoyant and on the expenditure side, recurrent component was found to be buoyant, while the development component was not.

Mishra (2005) investigated elasticity and buoyancy of sales tax in Jharkhand, a state in India for the period 1995 to 2004. The double log regression model was specified and estimated to determine the buoyancy parameter, while changes in the parameter estimates of the sales tax were then determined using the dummy variable technique. The findings showed that tax buoyancy was greater than unity on the average, implying that sales tax revenue in Jharkhand grew faster than the growth in GDP.

Upender (2008) adopted the linear OLS method of estimation, emphasising the unit root property to validate the outcomes inherent in the study of the degree of buoyancy on the Indian economy. He found that tax buoyancy is positively significant and more than unity during the pre-tax reform period, suggesting that gross tax is moderately elastic. The reverse was the case during the post-tax reform period. In another study, Ahmed and Muhammed (2010) examined the revenue of tax buoyancy in 22 countries, including Nigeria. The study empirically declared that Nigeria's tax system is far from buoyant and was estimated at 0.39 compared to 1.23 (Kenya) and 2.37 (Ghana). They summarised the determinants of tax buoyancy to include; growth in import, growth in industrial sector's output, growth in services sector's output, growth in agricultural sector's output, growth in grant, growth in fiscal deficit and growth in money supply (narrow and broad).

Milwood (2010) investigated the elasticity and buoyancy of the Jamaican tax system using quarterly data from March 1998 to December 2010. He specified a vector error correction model (VECM), which was estimated using the OLS estimation procedure and the Divisia Index (DI) buoyancy/elasticity estimation approach. The DI method was used because of its ability to separate the effect on total revenue into discretionary measures and the built-in response of tax revenues to the growth in GDP. The method involved three steps; removal of discretionary effects using an index that isolates the automatic growth in revenue, estimation of buoyancy with a linear regression model and the adjustment of buoyancy by transforming the index into weighted average, to determine the elasticity of the tax yield. The result indicated that in the case of customs duty/foreign trade tax, discretionary tax measures led to an increase in revenues over the estimation period.

Kargbo and Egwaikhide (2012) carried out a study on tax elasticity in Sierra Leone employing a time series approach covering a period between 1977

and 2009. Lending credence to the Singer (1968) method, dummy variables were used as proxies for four major identified discretionary changes; (1) lagged GDP as proxy for administrative bottlenecks, (2) pre and post sales tax introduction, (3) reforms period and (4) impact of war. A log linear model comprising tax revenue as dependent variables and the dummies as independent variables was estimated to underscore the effectiveness and dimension of tax productivity in Sierra Leone. The results revealed that most of the taxes investigated had elasticity ratios below unity, suggesting reasons for low tax revenue in the Sierra Leonean economy. For instance, low elasticity of import duty implied that tax evasion is high among importers. In addition, the study also found that the various discretionary measures were effective in mobilising tax revenue with the exception of 'impact of war'. The shortcoming of the study however, was its inability to state the methodology for estimating the specified model.

Samuel and Isaac (2012) conducted a similar but simplified study on the Kenyan economy covering the period from 1986 – 2009. Linear models were specified to represent tax-base and base-income. The study was undertaken for the aggregate (total income) and the disaggregated (specific taxes) levels. Series used for analysis include income tax, import duties, excise duties and sales/VAT tax. The Proportional Adjustment (PA) method of eliminating discretionary effects was adopted in the study while all series were converted to real terms to eliminate inflationary tendencies. The result showed that tax buoyancy in Kenya was very low and the tax system was inelastic. Comparatively, buoyancy ratios exceeded elasticity ratios in all cases implying that discretionary policy impact was significant. Further, the largest difference was observed for excise duties, indicating that the policies were more effective on trade. Overall, Kenya's tax system is neither income elastic nor buoyant at both the aggregate and disaggregated level.

Barfu-Insaidoo and Obeng (2012) researched on the impact of import liberalisation and customs reforms on tariff yield in Ghana covering the period/ 1965-2007. Using a double log model by relating real import tariff revenue to GDP, they estimated parameters of tax buoyancy. The estimates indicated that prior to 1983, when import liberalisation policy reform was initiated, import tariff buoyancy was high and fairly elastic, compared with the pre-reform period.

Omojimite and Iboma (2012) evaluated the link between fiscal deficit and the productivity of the Nigerian tax system between 1970 and 2010. The study was carried out in a systematic manner; first, using the entire period and then introducing structural breaks to take cognisance of episodes such as the oil

boom era and the SAP era. In each case, the study specified linear models of the relationship between selected variables which include; total tax revenue, gross domestic product, non-oil gross domestic product, non-oil total revenue, custom and excise duties, petroleum profit tax, total oil revenue, company income tax and total export duties. The models were estimated using the OLS technique and found that; (1) for most of the taxes, elasticities were relatively low; (2) elasticities were unity in the oil boom era; and (3) elasticities were also unity in the SAP era. The study concluded that overall, tax productivity in Nigeria is weak.

Muibi and Simbo (2013) conducted a study on the macroeconomic determinants of tax revenue in Nigeria. The study covered the period, 1970 to 2011. An error correction model was adopted. The model established the relationship between variables considered as indicators of macroeconomic effect (GDP, inflation and exchange rate) and tax revenue in Nigeria. The paper found that a change in GDP causes tax revenue to increase. The paper, therefore, concluded that macroeconomic stability was the main driver of tax buoyancy in Nigeria.

Osemwengie and Oriakhi (2013) adopted a standard multiple regression estimation procedure in establishing the dimension of tax buoyancy and elasticity in Nigeria using the aggregate tax. Vector Error Correction Model was employed and the outcomes revealed that, tax revenue was significantly buoyant and elastic in Nigeria.

Belinga et. al., (2014) estimated short and long-run tax buoyancy in 34 OECD countries for a period of 48 years from 1965 – 2012. The study employed panel autoregressive distributed lag model because of the time lag which was later transformed into a single Error Correction Model (ECM). The results of total tax buoyancy were mixed. On on average, both the long-run and short-run total tax buoyancy exceeded 1.0, suggesting that the OECD countries have highly productive tax system and sound fiscal management. The results of both the long-run and short-run disaggregated revenue buoyancy also yielded mixed results but identified CIT as the most buoyant in both cases.

From the literotures reviewed, it becomes clear that the studies relating to the investigation of tax buoyancy for the Nigerian economy is relatively scanty. Also, some of the studies (Ahmed and Muhammed, 2010) found that the tax system in Nigeria is not buoyant, while others such as Osemwengie and Oriakhi (2013) found revenue to be significantly buoyant and elastic in Nigeria. The study, wishes to therefore, clarify this contradiction. In addition, the scope covered in these studies did not extend beyond 2011 and were mostly focused on aggregate revenue only. Thus, this study seeks to evaluate the efficiency of the tax system in Nigeria by testing for revenue buoyancy and elas-

ticity of non-oil taxes (both aggregated and disaggregated into various tax components) and extends the scope of the study to 2014.

III. Stylised facts on Government Revenue in Nigeria

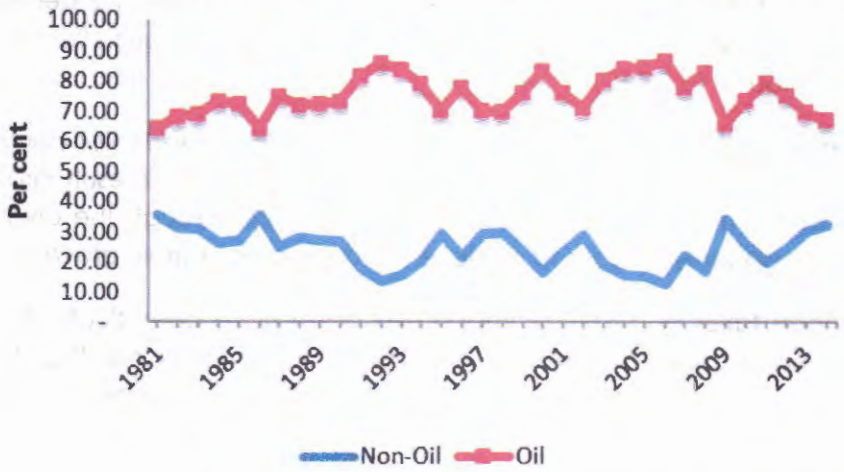
The 1950's to the early part of the 1970's saw agriculture as the main stay of economic activity in Nigeria followed by manufacturing and mining activities. The major export component of the Nigerian economy was agricultural commodities, while manufactured goods dominated her imports in international trade. Agriculture continued to play a pivotal role in the economic development of Nigeria as it contributed about 70.0 per cent of the country's GDP, employed about 70.0 per cent of the populace and accounted for about 90.0 per cent of the country's foreign exchange earnings as well as revenue by the time it attained independence in 1960. From early post-independence period up till the mid 1970's, there was rapid growth in industrial capacity and production as the contribution of manufacturing to GDP grew from 3.9 per cent to 10.0 per cent in 1981 (Adedipe, 2004).

By the late 1970's when oil became the mainstay of the Nigerian economy, the pattern of government revenue profile changed with oil sources accounting for a large chunk of government revenue, thereby becoming an oil dependent economy susceptible to oil prices vagaries. In Nigeria, revenue sources are divided into oil and non-oil. Within each category, there exists a tax and non-tax component. Oil revenue sources include receipts from crude oil export, petroleum profit tax, domestic crude oil sales, royalty, gas flare penalty, and gas sales. Federally collected non-oil revenue sources currently include broad receipts from customs/excise duties, company income tax, education tax, rents on government property, value added tax and independent revenue of the Federal Government.

Figure 1 shows that despite the fluctuations in oil revenue due to volatility in the price of oil, oil revenue has remained the major contributor to total revenue. In percentage terms, it increased from an average of 69.6 per cent in 1981-1985 to 71.4 per cent in 1986-1990. It further increased to 80.4 per cent in 1991-1995 and fell to 75.7 per cent in 1996-2000. The global financial crisis which occurred between 2008 and 2009 further affected the contribution of oil to total revenue as there was a drastic fall in international oil prices leading to a decline in oil of 77.6 per cent in 2006-2010 from 79.4 per cent in 2001-2005, while the drop in oil price in the second quarter of 2014 also led to a further drop to 73.1 per cent in 2011-2014. The non-oil sources of revenue have been less significant except for customs and excise duties, corporate tax and VAT. Given the relevance of non-oil revenue as a more predictable source of rev-

enue for planning purposes, the major concern of this study is to investigate the responses of individual tax sources to changes in the tax base.

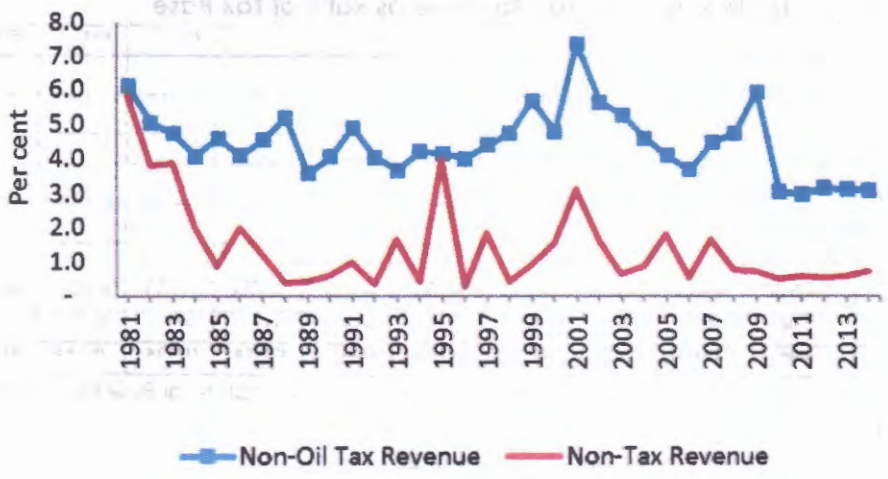
Figure 1: Oil and Non-oil Revenue as a ratio of Total Revenue



Source: Author's computation using data from the CBN Statistical Bulletin, December 2014

As a percentage of GDP, oil revenue remained the major contributor compared to the non-oil sources. Oil revenue's contribution to GDP has continued to increase but dipped in 1998 and started to rise showing the impact of oil price volatility on economic growth of Nigeria.

Figure 2: Non-Oil Tax and Non-Tax Revenue as a ratio of GDP



Source: Author's computation using data from the CBN Statistical Bulletin, December 2014

Figure 2, shows that as a ratio of GDP, non-oil tax revenue stood at 6.1 per cent while non- tax revenue was 5.8 per cent in 1981, which put both of them almost at par. They both declined in 1982 to 5.0 and 3.8 per cent respectively, and continued to decline until 1988 when non-oil tax revenue rose to 5.2 per cent from 4.5 per cent and non-tax revenue fell to 0.4 from 1.2 per cent as both began to decline from 1982 until non-oil tax revenue rose to became the major contributor to GDP.

From the foregoing, Non-oil tax revenue has remained the major contributor to GDP compared with its non-tax revenue counterpart. As a result, growth of the non-oil tax revenue base should be encouraged through the diversification of the economy in order to achieve the desired economic growth.

The Customs taxes as a ratio of import (tax base) have been fluctuating during the period under review. The outcome is reflected in the fact that increased customs taxes were not commensurate with the growth in imports, indicating the effect of poor tax administration or inefficiency in collection of import tax.

The corporate tax is assessed using private investment as a base. This is because corporate tax is derived from company profit. Consequently, investment is a major determinant of profit. Therefore, in this study we use investment as a proxy for the corporate tax base. In the same vein, volatility in the ratio for corporate tax was witnessed over the years. This could mean that the increase in corporate tax is not in line with the growth in investments. Perhaps, this may be attributed to tax evasion by a large portion of tax payers.

Table 2: Non-Oil Tax Revenue as Ratio of Tax Base

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Revenue/GDP	38.6	32.7	27.7	32.4	19.5	13.4	17.7	14.9	12.2	12.1
Non-oil Rev/Total GDP	5.9	4.2	6.1	5.5	6.7	3.5	3.0	3.1	3.3	3.5
Customs/Import	8.3	4.4	3.8	4.5	3.8	3.1	3.2	5.1	3.5	4.4
Corporate Tax/Investment	20.2	15.8	16.9	20.3	18.6	16.4	17.9	25.3	13.2	15.4
VAT/Con and Inv	1.5	1.7	1.7	2.2	2.1	2.1	2.4	3.1	10.4	9.8
Education Tax/Inv	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Total GDP	14,572.2	18,564.6	20,657.3	24,296.3	24,794.2	54,612.3	62,980.4	71,713.9	80,092.6	84,097.2
Oil GDP	137.0	130.9	125.1	117.5	118.1	124.3	124.6	123.5	123.1	122.2
Non-oil GDP	14,435.2	18,433.6	20,532.2	24,178.8	24,676.1	54,487.9	62,855.8	71,590.4	79,969.5	83,975.0

Source: Author's calculations based on data from the CBN Statistical Bulletin, December 2014

Note: 2014 figures are 5% incremental figures of 2013

Due to the nature of VAT, tax evasion is difficult and as a result the administration and collection of VAT recorded significant increase during the period as shown by the ratio of VAT to its tax base, consumption. The tax ratio, has therefore, increased from 1.5 per cent of the total consumption in 2005 to 9.8 per cent in 2014.

IV. Data and Empirical Analysis

IV.1 Description and Sources of Data

The study employed annual time series data for Nigeria spanning 1981-2014 on nominal government revenue components, including; total non-oil tax revenue (NOTR), Value Added Tax (VAT), Company Income tax (CIT), Customs and Excise Duties (CED), Education Tax (EDT) and nominal Non-oil Gross Domestic Product (NOGDP) as the broad tax base. Other tax revenue bases used in the analysis include Gross Fixed Capital Formation (GFCF), Imports of Goods and Services (IGS) and Private Consumption Expenditure (PCE). All the data were sourced from various issues of the CBN Annual Report and Statements of Account, as well as the CBN Statistical Bulletin.

IV.2 Approaches to Computation of Tax Elasticity and Tax Buoyancy

Tax elasticity is the ratio of percentage change in tax revenue to the percentage change in nominal income (GDP), without any discretionary changes in the tax rate or tax base. In calculating tax elasticity, the actual tax revenue is adjusted to remove the impact of discretionary changes in the tax system on the tax revenue. Tax buoyancy on the other hand reflects the changes in actual tax revenue as a result of the changes in both nominal income and discretionary economic measures. If a country's tax structure remains unchanged over a given period of time, her tax elasticity and the tax buoyancy will be equal over the specified period. Tax elasticity and buoyancy analyses are, therefore, imperative in understanding whether or not a country's actual tax revenue or the components thereof are capable of automatically and commensurately improving along the economy's growth path without any significant changes in the tax structure.

In the literature, two major approaches to the computation of tax elasticity and tax buoyancy are popular. One of the approaches to computing the elasticity and buoyancy is the traditional approach. However, the results of the traditional approach are now questionable because of its assumption that all tax revenues directly depend on the GDP, when some of the taxes do not bear such a direct relationship with the level of income. Import taxes, for instance do not directly depend on the level of GDP but on the volume and value of imports, which are in turn dependent on the level of income. To capture such indirect relationships requires an appropriate separation of the impacts to determine the overall elasticity and buoyancy coefficients.

The partitioning approach, thus, splits tax elasticity and tax buoyancy coefficients into two components: tax to base (which is estimated as a ratio of tax revenue to the proxy tax base), and base to income (estimated as a ratio of tax revenue to nominal GDP). The tax to base elasticity is influenced by factors like tax rates, tax holidays/exemptions and the efficiency of the tax administration upon which the fiscal authorities have a measure of control. The base to income elasticity is, however, influenced mainly by the response of the economic structure to growth. Though not always the case, the product of the tax to base and the base ta income elasticity or buoyancy yields the same result as the overall elasticity or buoyancy coefficient computed using the traditional appraach (Timsina, 2007).

We will, thus, compute the tax elasticity and tax buoyancy coefficients using both approaches ta verify the similarities of the results and confirm whether the tax system is elastic or inelastic.

IV.3 Procedures for Tax Revenue Adjustment

The three different procedures used in the literature for the adjustment of tax revenue series include the constant rate procedure, the praportional adjustment procedure and the dummy variable procedure. The decision on which procedures to adopt is a function of the availability of data, type and frequency of tax changes. The constant rate structure procedure can only be used when the data on tax rates and tax bases are available and the revenue accruable to the two can readily be decomposed. This is not the case in many developing countries. The proportional adjustment procedure necessitates the computation of the revenue exclusively accruable from the changes in discretionary measures as follows.

$$AJ_t = \frac{AR_t - DR_t}{AR_{t-1}} [AJ_{t-1}] \quad (1)$$

Where;

AJ_t = Adjusted tax revenue in the current period

AR_t = Actual Revenue in the current period

DR_t = Proportional Revenue attributed to discretionary changes in the current period

AR_{t-1} = Actual tax revenue in the previous one period

AJ_{t-1} = Adjusted tax revenue in the previous one period

The dummy variable approach is, however, appropriate in situations where changes in tax revenue due to discretionary measures are rare. Since changes in tax rates and tax bases are not frequent in Nigeria and revenue accruable to the changes in the tax rates and tax bases cannot be easily decomposed and are not readily available, this study adopts the dummy variable approach to eliminate the impact of discretionary changes in the estimated elasticity coefficients.

IV.4 Computation of Elasticity and Buoyancy Coefficients

Tax elasticity is expressed as the ratio of proportionate change in adjusted tax revenue to the relative change in income (GDP) such that:

IV.4.1 Tax Elasticity (E_{π})

$$E_{\pi} = \frac{\Delta AJ_d / AJ_d}{\Delta TB / TB} \quad (2)$$

Where:

ΔAJ_d = Change in tax revenue adjusted for the estimated impact of discretionary changes in the tax system.

ΔTB = Change in the actual tax base.

IV.4.2 Tax Buoyancy (B_T)

$$B_T = \frac{\Delta AR / AR}{\Delta TB / TB} \quad (3)$$

Where:

ΔAR = Change in the actual tax revenue. The tax buoyancy coefficient will be greater than the tax elasticity coefficient provided the discretionary tax changes are helpful in boosting total tax revenue; otherwise the tax revenue buoyancy and the tax elasticity coefficients will be the same.

IV.5 Model Specification and Estimation Procedures

The paper follows the model of Timsina (2007) to estimate the elasticity and buoyancy of the various tax components using the OLS regression technique.

The tax buoyancy equation is specified as follows;

$$LNOTR_t = \alpha + \beta LNOGDP_t + \mu_t \quad (4)$$

Where:

$NOTR_t$ = Tax revenue in the current period.

β = Elasticity coefficient of the individual tax component.

$NOGDP_t$ = Nominol Non-oil GDP at current market prices.
α = intercept;
μ_t = Stochastic error term.
L = Log operator, reflecting the double logarithmic transformation of the variables specified in (4).

The elasticity equation requires the adjustment of the buoyance equation to take care of discretionary changes in tax policies, administration etc. To achieve this, the dummy variable approach was adopted because of data limitation. The elasticity equation is specified as follows:

$$LNOTR_t = \alpha + \beta LNOGDP_t + DUM + \mu_t \quad (5)$$

Where:
$NOTR_t$ = adjusted to remove the impact of discretionary changes in the tax system.
β = Elasticity coefficient of the individual tax component.
$NOGDP_t$ = Nominal Non-oil GDP at current market prices.
DUM = captures policy and administrative changes
α = intercept;
μ_t = Stochastic error term.
L = Log operator, reflecting the double logarithmic transformation of the variables specified in (5).

In line with the partitioning approach, we further sliced equation (4) into two: tax to base and base to income buoyancy regression equations.
The double logarithmic expression of the tax to base buoyancy equation is specified thus:

$$LNOTR_t = \alpha + \beta LTB_t + \mu_t \quad (6)$$

Where:
$NOTR_t$, α, β, μ_t and L are as previously defined.
TB_t = Tax Base at time t.

The base to income buoyancy regression equation can be expressed as:

$$LTB_t = \alpha + \beta LNOGDP_t + \mu_t \quad (7)$$

Where: $TB_t, NOGDP_t, \alpha, \beta, \mu_t$ and L are as previously defined.

The tax to base elasticity equation captures the progressiveness and administrative efficiency of the tax structure. On the other hand, the base to income elasticity captures the responsiveness of the tax base to income. Thus, the elasticity equation for partitioning approach is specified as follows

The double logarithmic expression of the tax to base elasticity equation is specified thus:

$$LNOTR_t = \alpha + \beta LTB_t + DUM + \mu_t \quad (8)$$

Where:
$NOTR_t$, TB_t α, β, DUM, μ_t and L are as previously defined.

The base to income elasticity regression equation can be expressed as:

$$LTB_t = \alpha + \beta LNOGDP_t + DUM + \mu_t \quad (9)$$

Where: $TB_t, NOGDP_t, DUM, \alpha, \beta, \mu_t$ and L are as previously defined.

The product of the tax to base and base to income elasticity and buoyancy coefficients will be equal with the elasticity and buoyancy coefficients estimated under the traditional approach expressed in equation (4 and 5).

Equation 4 to 9 represents the general form of buoyancy and elasticity models that were adapted to estimate the coefficients of buoyancy and elasticities of each class of tax estimated; namely; the CIT, VAT, CED, EDT and NOTR.

IV.6 Time Series Properties of the Data

The Augmented Dickey-Fuller (ADF) and Phillips-Peron (PP) test procedures were used to verify the stationarity of the data series. The results are reported in Table 3. The results indicate that with the exception of VAT, all the included variables (in their national log) have unit roots and thus, are non-stationary at levels. However, all the non-stationary series became stationary after taking their first differences. The regressions were, thus, estimated on first difference for all the tax components except VAT which was run at level.

It is important to note that running the regression on first difference merely reflects growth and not elasticity coefficients. The variables were, therefore, transformed into their natural log before running the regressions in order to produce coefficients that can be interpreted as elasticities. The Cochrane

Orcutt Method [AR(1)] and Moving Average method [MA(1)] were used to correct the autocorrelation problem noticed in the estimated results (Timsina, 2007). Dummy variables (CITDUM and CEDDUM) were also introduced in the elasticity equations for tax components (CIT and CED) that were known to have witnessed changes in their rates and bases, albeit infrequently.

Table 3: Results of Unit Root Test

Variables	Augmented Dickey-Fuller		Order of Integration	Phillips-Perron		Order of Integration
	Test Statistic	Critical Value		Test Statistic	Critical Value	
LNOTR	-6.664	-3.654*	*I (1)*	-6.952	-3.654*	*I (1)*
LCIT	-15.805	-3.654*	*I (1)*	-15.805	-3.654*	*I (1)*
LGFCF	-4.076	-3.662*	*I (1)*	-3.906	-3.654**	*I (1)*
LVAT	-3.407	-3.021**	*I (0)*	-3.407	-3.021**	*I (0)*
LPCE	-5.102	-3.654*	*I (1)*	-5.073	-3.654*	*I (1)*
LCED	-5.440	-3.654*	*I (1)*	-5.437	-3.654*	*I (1)*
LIGS	-4.950	-3.654*	*I (1)*	-4.923	-3.654*	*I (1)*
LEDT	-4.016	-3.321**	I (1)	-6.976	-4.297*	I (1)
LGDP	-6.956	-3.654*	I (1)	-7.398	-3.654*	I (1)
LOGDP	-5.082	-3.662*	I (1)	-6.550	-3.654*	I (1)
LNOGDP	-7.451	-3.654*	I (1)	-9.088	-3.654*	I (1)

Note: *, ** and *** denote level of significance at1%, 5 % and 10 %, respectively.

V. Presentation and Analysis of Empirical Results

The empirical results of the elasticity and tax buoyancy coefficients of major taxes in Nigeria using the formulated models in section IV are presented in Table 4 and 5.

Table 4: Buoyancy of Major Taxes in Nigeria (1981-2014)

Major Taxes	Equation estimated	α	β
a) CIT			
Total Buoyancy	$lcit_t$ c $lngdp_t$, MA(1)	-4.51	1.06
Tax to Base	$lcit_t$ c $lgfcf_t$ AR(1)	-2.55	1.07
Base to Income	$lgfcf_t$ c $lngdp_t$ AR(1)	-1.32	0.92
b) VAT			
Total Buoyancy	$lvat_t$ c $lngdp_t$ AR(1)	-0.55	0.65
Tax to Base	$lvat_t$ c $lpce_t$ AR(1)	0.32	0.58
Base to Income	$lpce_t$ c $lngdp_t$ AR(1)	0.04	0.99

c) CED			
Total Buoyancy	$lced_t$ c $lnogdp_t$ AR(3) MA(1)	-1.67	0.74
Tax to Base	$lced_t$ c $ligs_t$ AR(1)	-0.74	0.74
Base to Income	$ligs_t$ c $lnogdp_t$ AR(4) MA(1)	7.61	0.76
d) EDT			
Total Buoyancy	$ledt_t$ c $lnogdp_t$ AR(1)	-5.61	0.99
Tax to Base	$ledt_t$ c $lgfcf_t$ AR(1)	3.16	0.0003
Base to Income	$lgfcf_t$ c $lnogdp_t$ AR(1)	-1.32	0.92
e) NOTR			
	$lnotr_t$ c $lnogdp_t$ AR(3) MA(1)	2.77	0.10

NB:
$lcit_t$ = natural log of corporate income tax at time t;
$lnogdp_t$ = natural log of nominal non-oil GDP at time t
α = estimated intercept
β = estimated buoyancy coefficient
$lvat_t$ = natural log of value added tax at time t;
$lgfcf_t$ = natural log of gross fixed capital formation at time t
$ledt_t$ = natural log of education tax at time t;
$lpce_t$ = natural log of private consumption expenditure at time t
$lnotr_t$ = natural log of non-oil tax revenue at time t;
$ligs_t$ = natural log of imports of goods and services at time t
$lced_t$ = natural log of customs and excise duties at time t
All buoyancy coefficients are significant 1.0 per cent

V.1 Company Income Tax

The results indicate that the elasticity of company income tax is 1.03 (Table 5), suggesting that, a 10.0 per cent change in the nominal GDP will yield a more than proportionate (10.3 per cent) change in company income tax. The result is significant at 1.0 per cent level with a satisfactory adjusted-R^2 of 0.99. DW statistics is 2.04 reflecting the absence of auto correlation in the estimated equation. The buoyancy coefficient, on the other hand is 1.06 (Table 4). It is higher than the elasticity coefficient by 0.03 indicating that only 0.3 per cent of the changes in company income tax as a result of a 10.0 per cent change in the nominal GDP were due to discretionary measures. The above findings clearly attest to the elasticity of company income tax in Nigeria. Discretionary measures, thus, play an insignificant role in generating company income tax in Nigeria during the period under review.

Also, in the case of 'tax to base' coefficients, buoyancy at 1.07 as shown in Table 4 is higher by 0.31 over the elasticity of 0.76 as illustrated in Table 5. This implies that although a 10.0 per cent change in the total tax revenue from Companies results in 7.6 per cent change in the CIT, the 3.1 per cent of the change is from discretionary measures. Also, in this case, elasticity is more than half of the buoyancy. One interesting finding here is that Companies Income Tax is highly responsive to the changes in the tax rate in Nigeria. This conclu-

sion is confirmed by the substantial increase in tax revenue from companies between 1994 and 2014. The substantial increase in tax revenue, arising from the reduced revenue leakages from tax avoidance and evasion as the CIT reduced from 40.0 per cent to 30.0 per cent during the review period led to the moderate responsiveness of the tax revenue to the changes in CIT.

Another important finding is that both the traditional approach (tax to GDP) and the partitioning approach (tax to base and base to income) for calculating the elasticity provide very similar results. In the case of CIT, the traditional approach provides an overall buoyancy of 1.06, while the buoyancy under the partitioning approach defined by the product of the tax to base (CIT to gross fixed capital formation) and the base to income (total CIT to GDP) is 0.98. Similarly, the traditional approach provides elasticity coefficient of CIT at 1.03, while the partitioning approach, and has an elasticity coefficient of 0.74.

V.2 Customs and Excise Duties

The elasticity of Customs and Excise Duties (CED) is 0.03 (Table 5) suggesting that a 10.0 per cent change in the nominal GDP will yield a less than proportionate (0.3 per cent) change in customs and excise duty. The result is significant at 1.0 per cent level with a satisfactory adjusted-R^2 of 0.99. DW statistics is 1.79, reflecting the absence of auto correlation in the estimated equation. The buoyancy coefficient, on the other hand is 0.74 (Table 4) and higher than the elasticity coefficient by 0.71, indicating that 7.1 per cent of the changes in customs and excise duty due to a 10 per cent change in the nominal GDP were due to discretionary measures. The above finding is clearly suggestive that customs and excise duties are inelastic in Nigeria. However, it could be observed that discretionary measures played a significant role in generating customs revenue during the review period.

Also, in the case of the 'tax to base' coefficients, buoyancy at 0.74 (Table 4) was higher by 0.34 over the elasticity of 0.40 (Table 5). This implies that of the 7.4 per cent increase in total customs revenue, arising from the 10.0 per cent change in GDP, 3.4 per cent was from discretionary measures and the balance from change in tax rates. In this case, elasticity is more than half of the buoyancy. One interesting observation from the result is that customs revenue is highly unresponsive to the changes in tax rates in Nigeria. This conclusion is confirmed by the fact that despite impressive increase in customs revenue during the study period, there were no significant increases in tax rates. The decrease in tariff rates as a result of the Common External Tariff (CET) accord, removal of some quantities restrictions, exemptions of intermediate manufac-

turing inputs, sizable duty waivers and the ample revenue leakages arising from the inefficiency in tax administration could be attributed to the non-responsiveness of customs revenue to the changes in tax rates.

Another important finding is that both the traditional approach (tax to GDP) and the partitioning approach (tax to base and base to income) for calculating the elasticity provide close results. In the case of CED, the traditional approach provides buoyancy (CED to GDP) of 0.74. The product of the tax to base (CED to gross fixed capital formation) and the base to income (total CED to GDP) under the partitioning approach is 0.56. Similarly, the traditional approach provides elasticity coefficient of CED at 0.30, and 0.50 in the partitioning approach.

V.3 Value Added Tax/Education Tax

Elasticity coefficients were not computed for VAT and Education tax as the rates on these taxes remained the same over the period under review. However, the buoyancy coefficients of VAT and Education tax were 0.65 and 0.99, respectively, during the period under review. Though the major reason for introducing VAT in Nigeria was to broaden the tax base to increase tax revenue, the above empirical evidence suggests that VAT is inelastic. The buoyancy coefficients obtained under the partitioning approach confirmed the result of the traditional approach. The results of both the traditional and partitioning approaches also indicated that education tax in Nigeria is inelastic.

V.4 Total Non-Oil Tax Revenue

Total non-oil tax revenue, which contributes less than 20.0 per cent of the total revenue in Nigeria, was found to have an elasticity coefficient of only 0.09, which is less than the buoyancy coefficient of 0.10 by 0.01. The result suggests that the automatic growth of tax revenue in Nigeria is very low in view of the above empirical finding. The elasticity coefficient of 0.09 indicates that a 10.0 per cent change in the nominal GDP will change total non-oil tax revenue (adjusted for the estimated impact of discretionary changes in the tax system) by only 0.9 per cent. The buoyancy coefficient of the total non-oil revenue is far less than unity (0.10) with a difference of 0.01, compared with the elasticity coefficient of 0.09. This further indicates that a 10 per cent change in nominal GDP will lead to only 0.1 per cent change in total non-oil tax revenue via changes in discretionary measure. Overall, the results indicate that non-oil tax revenue in Nigeria will not automatically respond to changes in nominal GDP. The discretionary measures taken during the period to remedy the situation were also found to have insignificant impacts on non-oil tax revenue mobilisation.

Table 5: Elasticity of Major Taxes in Nigeria (1981-2014)

Major Taxes	Equation estimated	α	β	CITDUM		CEDDUM
DUM						
f) CIT						
Total Elasticity	$lcit_t$ c $lnogdp_t$ CITDUM, MA(3)	-4.18	1.03	-0.46	na	na
Tax to Base	$lcit_t$ c $lgfcf_t$ CITDUM, MA(5)	-2.53	0.76	-0.49	na	na
Base to Income	$lgfcf_t$ c $lnogdp_t$ CITDUM, AR(2) MA(4)	-1.76	0.97	-0.34	no	
na						
g) CED						
Total Elasticity	$lced_t$ c $lnogdp_t$ ceddum AR(1) MA(4)	3.10	0.30	na	-0.09	na
Tax to Bose	$lced_t$ c $ligs_t$ ceddum AR(8) MA(1)	-2.45	0.40	no	-0.11	na
Base to Income	$ligs_t$ c $lnogdp_t$ ceddum AR(1) MA(9)	1.46	0.65	no	0.25	na
h) NOTR	$lnotr_t$ c $lnogdp_t$ MA(4)	3.01	0.09	na	na	-0.83

NB: Figures in parenthesis are t-statistics
$lcit_t$ = natural log of corporate income tax at time t
α = estimated intercept

$lvat_t$ = natural log of value added tax at time t
β = estimated buoyancy coefficient

$ledt_t$ = natural log of education tax at time t
AIC = Akaike Information Criterion

$lnotr_t$ = natural log of non-oil tax revenue at time t
SIC = Schwarz Information Criterion
$lced_t$ = natural log of customs and excise duties at time t
$ligs_t$ = natural log of imports of goods and services at time t
CITDUM = Corporate income tax dummy
$lgfcf_t$ = natural log of gross fixed capital formation at time t

CEDDUM = Customs and excise duties dummy
$lpce_t$ = naturol log of private consumption expenditure at time t
DUM = policy
no = Not applicable

VI. Conclusions and Recommendations

The analysis of tax elasticity and buoyancy shows an inelastic tax structure in Nigeria for the period 1981-2014. Apart from CIT, all other taxes were not responsive to changes in income with most elasticity coefficients falling below unity. The proxy bases did not yield different results in terms of their responsiveness to tax system. According to Adhikari, (1995), a progressive tax system needs to have at least greater than unitary value of the coefficient of elasticity, while a higher degree of progressivity in the tax structure would result in an elasticity greater than 2 (Dahal, 1984). Also, there are evidences that the discretionary measures taken during the study period were not effective as

shown in the low discrepancies between the buoyancy and elasticity coefficients.

The inability of tax system to automatically respond to the changes in nominal income as well as the failure of the discretionary measures to address the challenges in the tax system during the study period could be attributed to inherent inefficiencies in the tax system occasioned by excessive tax exemptions, duty waivers, low compliance, huge corruption practices and paucity of data for assessment in order to be able to capture a sizeable number of taxable entities in the country. Thus, for the planned decentralisation of the Nigerian revenue base from oil to occur, rigorous efforts of the fiscal authorities would be needed to improve the overall tax system and the efficiency of revenue administration.

This study thus, recommends the following:

(a) That, since non-oil tax revenue is responsive to the changes in CIT, but less responsive to discretionary policies, there is need to put measures in place to curtail leakages associated with tax avoidance and tax evasion by addressing the incidence of double taxation in Nigeria. The Federal Inland Revenue Services (FIRS) also needs to ensure that all companies currently not in their database are brought under the tax net to broaden the CIT base.

(b) Since customs revenue is not responsive to the changes in the tax rates, there is need to enhance the efficiency of customs administration so as to control revenue leakages by improving on the Automated System for Customs' Data (ASYCUDA), minimising smuggling through enhanced customs border patrol, and reducing import duty waivers, amongst others.

(c) The potential of VAT to contribute immensely to tax revenue is high despite the observed low buoyancy coefficient. The FIRS, therefore, needs to improve on its collection efforts through administrative efficiency. This is expected to minimise the current leakages in VAT revenue and its remittances to the government as well as make the tax deduction and VAT refund process less cumbersome. There is also the need to increase consumer awareness, increase the rate on luxurious items and broaden the VAT base by integrating the informal sector.

(d) Overall, there is need for stronger collaboration among the relevant fiscal authorities to overhaul the Nigerian tax system towards enthroning a simple, equitable, fair and vibrant tax system that reduces the effective

tax rates while at the same time curtailing the incidence of double taxation in the country to induce voluntary tax compliance. Above all, there is need to streamline the tax structure and rates, reduce tax waivers and bureaucratic bottlenecks in the tax administration.

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