

Productivity of the Nigerian Tax System (1994 - 2013)

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Abstract

With the recent fall in the price of crude oil below the budget benchmark Government rely more on tax to finance the budget. This paper therefore examines the productivity of the Nigeria tax system using a time series data of 20 years. All the data for the analysis was collected from central bank statistical bulletin and federal inland revenue service annual report of various years. The data was decomposed. The study uses tax elasticity and buoyancy approach. Regression in Minitab statistical soft-ware was use to analyzed the data. The study finds a linear relationship between tax base and tax revenue. The analysis also reveals that there is a significant positive relationship between tax policy and tax base and a weak relationship between tax revenue and economic growth. The study therefore recommended among others that the Government should switch more from direct tax to indirect tax which is less distortionary and has fewer burdens on the tax base.

Keywords: tax productivity, tax base, tax policy, tax buoyancy and tax elasticity

1. Introduction

Taxation is a veritable and sustainable source of revenue for government and a tool for fiscal policy and macro-economic management. It is a potential tool of economic and social reform as it pervades all aspect of the economy, individual, companies, citizens and foreigners. As a macroeconomic tool, Marshal (1992) likens its efficacy to power to destroy.

Taxation is a fiscal measure used to reduce inequalities of wealth in the society and a mechanism for the provision of needed revenue for socio-economic development (Aguda 1999). The economist sees it as a tool for macroeconomic policy and revenue generation to finance government deficit. It is believe that the magnitude of government surplus or deficit is the major statistical measure of the impact of government fiscal policy on an economy (Siegel 1979). Fiscal deficit has become a recurring feature of public sector financing all over the world. A well-structured tax system offer government opportunity to generate needed revenue to meet its ever growing financial expenditure. Azubike (2007) believe that an effective tax system offers the most effective means for mobilizing internal resource and creates an environment conducive for the promotion of economic activity.

The Nigeria tax system has undergone significant changes in recent times. The tax laws are being reviewed with the aim of repelling obsolete provisions and simplifying/removing ambiguity from the main ones. The Nigeria tax system is lopsided and dominated by oil revenue which poses challenges to the establishment of effective and efficient tax system (Oduola 2006). Oduola, identifies some of the challenges facing the Nigeria tax system which includes-paucity of data, non-availability of tax statistics, poor administration, multiplicity of tax, structural problem and non-prioritization of tax effort.

Nigeria operates a federal system of government with three arms and three tiers of government; the federal, the state and the local government each receiving monthly allocation from the federation account (pooled revenue) generated mostly from taxation. Nigeria tax system comprises of direct and indirect taxes. The tax administration and jurisdiction in Nigeria is structured in line with the government fiscal power. There are tax exclusively for the federal government, some are shared between the federal and state; some taxes are within the jurisdictions of the state while others for the local government. Tax history in Nigeria predates the amalgamation of Nigeria in 1914. The earliest trace of tax in Nigeria was in northern Nigeria. The north was favoured for this partly because it had a form of organized central administration under the emir unlike the south and west. Furthermore the Muslim religion adhered to by the people approved of taxation as being consistent with the demand of islam. Thus taxes such as zakka, gada,

kindin, karat and jangoli are tax imposed on agriculture then; with the colonization of Nigeria, the British take advantage of the established tax system and introduce direct tax in 1904, this become the time income tax was first introduced in Nigeria. Later changes were made with the enactment of native revenue ordinance of 1917 which is applicable to Ogun state and Benin and in 1923 it was extended to eastern Nigeria.

Tax is a fiscal tool, a compulsory payment/ levy imposed on the subject or his property by the government to generate the needed revenue for the provision of security, social amenities and for the day to day running of the government affair. Tax laws in Nigeria formed part of 1999 constitution, with various minor amendments made to the block loopholes and use as macroeconomic tools.

The Nigeria tax system comprises of the tax laws, policies and tax administration. On the tax laws, Odusola (2006) observed that all the tax laws currently in effect in Nigeria are those enacted during the military regime. The civilian regime which has ruled the country since 1999 is yet to enact any major tax law despite pending critical issues. With exception of the 1999 constitution, the tax laws have been amended on yearly basis in the annual Budget to correct possible loopholes. Recently, Government have taken various reforms steps to address those problems and correct the lopsidedness inherent in the system, enhance efficiency and block various loopholes in the tax system with aims of enhancing productivity, protect local industries, promote local content, generating increased government revenue, enhance value added by locally manufactured good and primary product.

1.1 Statement of the Problem

Nigeria operates a cash budget system where expenditure proposal are anchored on projected revenue. To meet this projected revenue, Government has three options: to borrow, to tax or both. Using tax, governments try determines the optimal tax rate for a given level of expenditure. Musgrave (1959) observes that economic development brings about increase in demand for public expenditure and the increase must be matched by in a greater extent with supply in taxing capacity. Since tax is the major source of Government revenue in Nigeria to meet its expenditure (on providing security, promoting SME, and providing the conducive economic environment for business to thrive and basic amenities) on one hand and the myriad problem facing the tax system couple with the fall of the crude oil price and the introduction of austerity measure couple with the aggressive tax drive by the federal government in other to generate revenue to fiancé the budget, the question is to what extent can the tax system generate the needed revenue? to what extent can the tax system be relied upon as a potent toll for revenue generation to meet up with this ever increasing government expenditure burden i.e. How productive is the tax system The studies on the productivity of the Nigeria tax system are few, limited in scope, coverage and method of analysis adopted. For instance, Omoruyi (1983), Ariyo (1997) and Omojinite and Iboma (2012) Study the productivity of the Nigeria tax system. Omoruyi (1983) study covered the period of 1960 – 1979, Ariyo (1997) updated the study by covering a longer period of 1960 – 1990 while Omojinite and Iboma (2012) study covers the period of 1970 – 2010. The result from these studies is mixed and hence hard to draw policy prescription from. This study covers a larger scope and it adopt a robust methodology.

1.2 Objectives of the Study

The general objective of this study is to evaluate the productivity of tax policy. The specific objectives include to:

1. Ascertain the relationship between tax policy and economic growth in Nigeria.
2. Examine the relationship between tax base and tax revenue
3. Determine the effect of change in tax policy on tax base.

1.3 Statement of Hypothesis

The following are the Hypotheses formulated for this research work.

Ho¹: There is no significant relationship between tax policy and economic growth of Nigeria.

Ho²: There is no significant relationship between tax base and tax revenue in Nigeria.

Ho³: There is no significant relationship between tax policy and tax base in Nigeria.

2. Review of Related Literature

A good tax system as a macro-economic policy tool have a direct impact on economic growth of a nation given nation Through its effects on savings, investment, labour and research and the possible substitution between these factors.

Nigerian tax system is concentrated on direct and broad-based indirect taxes like the value-added (VAT) are neglected. This is a structural problem for the country tax system. Although direct taxes and VAT have the potential for expansion, their impact is limited because of the dominance of the informal sector in the country. Furthermore, the limited formal sector is supported with strong unions that act as pressure groups to deter any appreciable tax increment from gross income. The widening fiscal deficit that over the years has threatened macroeconomic stability and prospects for economic growth makes the prospect of tax reform very appealing.

The Nigerian tax system has experienced series of reforms since 1904 to date. The effects of the various reforms in the country are as follows:

1. The introduction of income tax in Nigeria between 1904 and 1926.
2. The grant of autonomy to the Nigerian Inland Revenue in 1945.
4. The formation of the Inland Revenue Board in 1958.
5. The promulgation of the Petroleum Profit Tax Ordinance No. 15 of 1959.
6. The promulgation of Income Tax Management Act 1961.
7. The establishment of the Lagos State Inland Revenue Department.
8. The promulgation of the Companies Income Tax Act (CITA) 1979.
9. The establishment of the Federal Board of Inland Revenue under CITA 1979.
10. The establishment of the Federal Inland Revenue Service between 1991 and 1992.
11. The tax policy and administration reforms amendment 2001 and 2004.

The most current amendment of the Personal Income Tax Act, 2011. Another reform embarked upon by the Nigerian government was instituting the Study Group on the Nigerian Tax System. This group was inaugurated on the 6th of August, 2002, to examine the tax system and make appropriate recommendations towards entrenching a better tax policy and improved tax administration in the country.

Nigeria fiscal policy measures have been largely driven by the need to promote certain macroeconomic objectives as promoting rapid growth of the economy, generating employment, maintaining price levels and improving the balance-of-payment conditions of the country. Although policy measures change frequently, these objectives have remained relatively constant. Until the mid 1980s, tax policies, for instance, were geared to achieving such specific objectives as:

- i) Ensuring effective protection for local industries;
- ii) Encouraging greater use of local raw materials;
- iii) Enhancing the value added of locally manufactured and primary products;
- iv) Promoting greater geographical dispersion of domestic manufacturing activities;
- v) Generating increased government revenue.

As regards institutions relevant to the tax system, it is noted that the efficiency of a

Country's institution has significant bearing on its operations. For instance, between 1999 and 2002, FIRS accounted for 74.5 per cent of federal revenue while the NCS collected the balance. below is the table containing the list of taxes, their administration and jurisdiction power.

Table 1. Nigeria's major taxes

Types of tax	Jurisdiction /legis.	Adm. / collection
1. Import duties	Federal	Federal
2. Excise duties	Federal	Federal
3. Export duties	Federal	Federal
4. Mining rents and royalties	Federal	Federal
5. Petroleum profit tax	Federal	Federal
6. Companies income tax	Federal	Federal
7. Personal income tax: Armed forces, external affairs officers and Federal Capital Territory	Federal	Federal

8. Capital gains tax	Federal	States
9. Personal income tax	Federal	States
10. License fees on television and wireless radio	Federal	States
11. Stamp duties	Federal	States
12. Estate duties	Federal	States
13. Gift tax	Federal	States
14. Sales or purchase tax	Federal	States
15. Football and other betting taxes	States	States
16. Vehicle tax and driver license fee	States	States
17. Entertainment tax	States	States
18. Land registration and survey fees	States	States
19. Property tax	States	Local
20. Market and trading license fees	States	Local

Source: Phillips (1991) as cited by Ademola Ariyo (1997)

Currently, the legal provisions of the various types of taxes have been codified, although they have been subjected to several revisions. Interested readers are referred to Federal Government of Nigeria (1989a) and Federal Inland Revenue Service (1990) for the latest set of amendments to the tax sources covered in this study. Some of the major pieces of legislation are:

- **The Income Tax Management Tax (1961)** - This act regulates personal income tax throughout the federation. It lays down the procedures for estimating personal income, as well as the various reliefs and allowances to which individuals are entitled. In essence, it explains the basis for personal income tax assessment throughout the country.
- **Companies Income Tax (1979)** - This act prescribes tax assessment and collection procedures for all corporate bodies in the country. Activities relating to crude oil and natural gas are excluded, however; these are covered by a separate act.
- **Capital Gains Tax (CGT) (1967)** - The CGT provides guidelines for the calculation of profits on the sale of fixed assets and shareholding in corporate entities.
- **The Petroleum Profits Tax (PPT) Act (1959)** - This act specifically addresses the operators in the oil industry. It is believed that oil prospecting and the nature of operations of oil producing organizations are uniquely different from the normal operations of other corporate organizations and thus warrant a special provision.

2.1 Tax Policy and Tax Revenue

Various efforts have been made to quantify the relationship between tax revenue and tax rates. While the interaction between tax rates and tax revenue is generally accepted, the precise nature of this interaction is debated. In practice, the shape of a hypothetical Laffer curve for a given economy can only be estimated. The relationship between tax rate and tax revenue is likely to vary from one economy to another and depends on the elasticity of supply for labor and various other factors. Even in the same economy, the characteristics of the curve could vary over time. Complexities such as progressive tax (VAT) and possible differences in the incentive to work for different income groups complicate the task of estimation. The structure of the curve may also be changed by policy decisions. For example, if tax loopholes and off-shore tax shelters are made more readily available by legislation, the point at which revenue begins to decrease with increased taxation is likely to become lower.

Laffer assumes that the government would collect no income tax at a 100% tax rate because there would be no incentive to earn income. Research has developed theoretical mathematical models in which a Laffer curve can slope continuously upwards all the way to 100%, though it is not clear whether or when the assumptions on which such mathematical models are based hold in real economies. Additionally, the Laffer curve depends on the assumption that tax revenue is used to provide a public good that is separable in utility and separate from labor supply, which may not be true in practice.

One of the uses of the Laffer curve is in determining the rate of taxation which will raise the maximum revenue (in other words, "optimizing" revenue collection).

2.2 Tax Base and Tax Policy

Tax base and Tax policy influences economic behaviour both at the micro and macro level, hence an important stabilization tool for economic policymakers. The level of taxation in any nation will affect people's economic behaviour, including their choices in working, saving, and investing. A high tax regime not only imposes high welfare cost but also drastically affects consumer spending, through reduction of the disposable income. The level of spending in any economy is affected by the level of taxation. A high tax burden can have a drastic adverse effect on the overall economy. It also contributes or worsens tax evasion and avoidance. While tax rate in the developed countries is high, there is also an adequate social security system that mitigates the welfare cost in form of Job seekers' allowance, Child allowance and various students' scholarships and loan facilities.

For example, consideration of a nation's tax policy influences multinational firms' decisions on setting-up of their businesses/firms in a particular country, thus most countries attract multinational firms through generous tax incentives and holidays. Investment decisions by companies are also affected by taxation, investment includes such items as machines, factories, computers, trucks, and office furniture. Most economists believe that business taxes decrease the amount of physical investment by businesses. Taxes also influence the types of physical investments that businesses make. This is because the government taxes return on some types of investments at higher rates than others. By distorting physical investment decisions, the tax system may sometimes lead to an inefficient pattern of investment.

Thingan (1995) opines that tax is the most potent economic tool which facilitates reduction of private consumption, increase investment, resource allocation and transfer to government resources for economic growth is also a tool for expansion and contraction of an economy Ifurueze and Odesa (2013) believe that government having the tax system as the most veritable macro-economic tool (for revenue generation & resource allocation) will seek to maximize it returns using an appropriate rate of tax which will generate the maximum revenue needed. This is the tenets of Laffer curve. The curve is based on the theory that decreased tax rates reduces default rate and result to greater tax revenue through increased economic activities. It shows the relationship between government revenue raised through taxation and rates of taxation. Laffer curve is used to illustrate the concept of taxation income elasticity (percentage change in tax income as a result of change in tax rate).

2.3 Theoretical Exposition

The Laffer Curve was developed in 1979 by economist Arthur Laffer. According to Laffer's theory, changes in tax rates affect Government revenue in two ways. One is immediate, which Laffer describes as "arithmetic." Every dollar in tax cuts translates directly to one less dollar in government revenue.

The other effect is longer-term, which Laffer describes as the "economic" effect. This works in the opposite direction. Lower tax rates put more money into the hands of taxpayers, who then spend it. This creates more business activity to meet consumer demand. Next, companies hire more workers, who spend their additional income. This boost to economic growth generates a larger tax base, which eventually makes up for the initial revenue lost from the tax cut.

The Curve shows that, zero taxes will result in no government revenue and, thus, no government. Of course, increasing taxes from zero immediately boosts government revenue. In the beginning, raising taxes still does a good job of increasing total revenue, as the government keeps raising taxes, the payoff in additional revenue becomes less, and the curve steepens.

Laffer curve: Represents the rate of taxation at which maximal revenue is generated. This, however, need not be single peaked nor symmetrical at 50%.

Laffer explains the model in terms of two interacting effects of taxation: an "arithmetic effect" and "economic effect". The "arithmetic effect" assumes that tax revenue raised is the tax rate multiplied by the revenue available for taxation (or tax base). Thus revenue is equal to $R=t \times B$ where t is the tax rate and B is the taxable base. At a 0% tax rate, the model assumes that no tax revenue is raised. The "economic effect" assumes that the tax rate will have an impact on the tax base itself. At the extreme of a 100% tax rate, the government theoretically collects zero revenue because taxpayers change their behavior in response to the tax rate: either they have no incentive to work or they find a way to avoid paying taxes. Thus, the "economic effect" of a 100% tax rate is to decrease the tax base to zero. If this is the case, then somewhere between 0% and 100% lays a tax rate that will maximize revenue. The effect of changes in tax can be case in terms of elasticity, where the optimal elasticity of the tax base with respect to the tax is equal to 1. This is done by differentiating R with respect to t and grouping terms to reveal that the rate of change of R with respect to t is equal to the sum of elasticity of the tax base plus one all multiplied by the tax base. Thus as elasticity surpasses one absolute value, revenues begin to fall.

2.4 Empirical Review

Ariyo and Raheem (1991) study the effect of fiscal deficit on some macro economic variable in Nigeria using content analysis, finds that fiscal deficit financing by various government bring positive effect and accelerated economic growth. Thompton (1990) in his study on the impact of fiscal deficit on economic growth, reveals that there is a positive relationship between fiscal deficit and economic growth. Omojimite and Iboma (2012) findings shows a positive relationship between fiscal deficit and inflation and a negative relationship between private investment and national income.

Baily (1980) Feldstein (1980) Landau (1983) their studies find a negative relationship between fiscal deficit financing and economic growth. The differences in opinion on the effect of fiscal deficit financing on the Nigeria economy arise from the mode of financing, Nature, scope and objective. However, Buitter (1983) Wickens and Uctum (1990) argued that the relationship between fiscal deficit financing and economic growth is not as important issue as the sustainability of the fiscal deficit profile. Financing the fiscal deficit in developing nations especially Nigeria Government have undertook tax reforms which focused on the tax structure ad on tax administration geared toward generating more revenue from the existing tax sources. In the past few decades, successive governments have expressed concern about the low level of productivity of the Nigeria tax system which has been attributed largely to the deficiencies in the tax administration and collection system, complex legislation and apathy especially on the part of those outside the tax net (Ijewere 1991) Odusola (2006) in his study of the tax policy reform in Nigeria using a descriptive research design believe that the Nigeria tax system is a reflection of the federal system of government hence its fiscal operations adhere to the same principle. The African Economic Research consortium (AERC) (1998) study on tax reforms and revenue productivity in Ghana reveals that the Buoyancy estimates and income elasticity of individual taxes and the overall tax have more than unity and the findings shows that tax reform contributed to the growth of revenue from 1983 to 1993.

Ariyo (1997) study on the productivity of the Nigeria tax system reveals strong and weak productivity for the taxes. His study is an improvement on Omoruyi (1983) on the following grounds: first, the study covers the period of 1960 – 1990 with update analysis, second, the study capture the impact of structural changes in the macro economic management framework, third Ariyo disaggregated his analysis around notable economic event such as pre and post oil boom era and the impact of structural adjustment program me (SAP) on the buoyancy of the Nigeria tax system Omoruyi's in (1983)disaggregated his analysis in terms of decades.

This study is anchored on the Revenue Productivity Theory. The theory is based on the concept of Tax Elasticity and Tax buoyancy. A good tax system is therefore adjudged by the strength of its productivity. The productivity of a tax system is the ability of the tax system to yield maximum revenue for the government with a given tax base without placing a difficult economic burden on the taxpayer. Two approaches are used to evaluate the productivity of a tax system (Asher 1989; Osoro 1991) they are: (1) tax buoyancy (2) tax elasticity.

Tax buoyancy measured the changes in tax revenue attributable to changes not only in taxpayer income but also other discretionary changes in tax policy. Tax Elasticity measure the changes in tax revenue attributable to changes to income (growth in tax revenue minus growth as a result of changes in tax policy is equal to tax elasticity)

Haughton (1998) defined tax buoyancy as the rate of change in tax revenue with respect to the tax base, using a number for the revenue and base. Tax buoyancy (TB) is given as:

$$TB = \frac{\% \Delta Revenue}{\% \Delta Base} \quad (1)$$

The Base is taken Gross Domestic product (GDP).

Osoro (1991) provided an alternative measure of tax buoyancy as follows:

$$TR = aY^b + er \quad (2)$$

Where TR = Total tax Revenue, Y is the GDP at current price and er is the error term.

Long- transformation of equation (2) yields

$$\text{Log TR} = \text{Log } a + b \text{log Y} + er \quad (3)$$

Where b provides an estimate of tax buoyancy. It measures in percentage terms the change in total tax revenue due to a change in GDP and the effect of discretionary changes in tax policy.

Tax Elasticity: To measure the elasticity, is necessary to isolate the effect of discretionary changes in tax policy on tax revenue. This approach suffers from major setback as noted by Ariyo (1993) (1) No data on revenue receipt

directly strictly attributable to discretionary changes in tax policy. It also assumes that the discretionary changes are progressive as the underlying tax structure and it is highly aggregative.

Omoruyi (1983) provided an alternative approach to measure tax efficiency as follows:

$$\frac{\Delta T}{\Delta Y} \times \frac{Y}{T} \quad (4)$$

for given tax, N by

$$\frac{\Delta T}{\Delta Y} \times \frac{Y}{T_n} \quad (5)$$

Where T_n the tax revenue includes discretionary changes in the tax base and rate Y refers to GDP at current prices. The income elasticity of a given tax represented by equation 4 can be decomposed into two components i.e.

- (1) The elasticity of the tax to base year
- (2) The elasticity to the base year to Income

The tax to base year could be represented by

$$\frac{\Delta T_n}{\Delta B_n} \times \frac{B}{T_n} \quad (6)$$

and into Base – to - income elasticity

$$\frac{\Delta T_n}{\Delta B_n} \times \frac{B}{T_n} \quad (7)$$

The relationship can be expressed in the following identity

$$\frac{\Delta T_n}{\Delta Y} \times \frac{Y}{T_n} = \left[\frac{\Delta T_n}{\Delta B_n} \times \frac{B_n}{T_n} \right] \left[\frac{\Delta B_n}{\Delta Y_n} \times \frac{Y_n}{B_n} \right] \quad (8)$$

Equation 8 indicates that any tax system is a product of elasticity of tax – to – base and of base – to – income.

3. Methodology

This study is an Ex-post Facto method. Time series data of twenty five years was obtained and used for the analysis. Two variables appear relevant to this study. The times series of Gross Domestic Product (GDP) and the yield of aggregate tax-based revenue, as well as each tax source for the period covering 1994 – 2013. This period falls into the post structural adjustment program me (SAP) era.

The data for the various taxes will be extracted from the federal inland Revenue service annual report data on economic growth will extracted from the CBN statistical bulletin while the data on value of finish and important goods was collected from the ministry commerce and chamber and the Nigeria customer report respectively.

3.1 Model Specification

The productivity model used in this study is the same to that used by Kusi (1998) in his study of Ghanaian tax system. In this study, tax buoyancy is adopted as against elasticity in the decomposition process of tax to base and base to income. This method eliminates the elasticity approaches used by Ariyo (1993) Omojenite and Iboma (2012) which require the isolation of the impact of discretionary tax measures. This approach used is the same as that used by Dickson and Presley (2013), it is preferable because of the pervasive nature of discretionary change in Nigeria budgetary process.

3.2 Model Decomposition

The Buoyancy of the individual taxes is decomposed into the product of the buoyancy of the tax to its base, the buoyancy of the base to income and the buoyancy of the tax to income (GDP). The choice of Buoyancy criterion was a fall out of the frequent discretionary tax measures whose impact were difficult to quantify due to dearth of data, thereby hindering an elaborate venture into the assessment of the elasticity of the Nigeria tax system (Dickson and Presley 2013).

Many variables have been identified as affecting tax buoyancy and tax elasticity. However, the main variable used for this work includes.

GDP = Gross Domestic product, TTR = Total Tax Revenue, CIT = Company Income Tax, Petroleum Profit Tax (PPT) Values Added Tax (VAT), Custom and Excise Duty (CED), NGDP – Non Oil Total, IMP = Total Import VFG = Valuable Finished Goods, TOR Total Oil Revenue.

$$TTR = F (GDP, NGDP, TOR, NOR, CED, PPT, CIT, VAT, VFG).$$

Time regression equation for the analysis is as follows.

$$TR = a_0 + a_1 GDP + a_2 CIT + a_3 PPT + a_4 CED + a_5 VAT + a_6 TOR + U_t$$

However, to assess the Buoyancy for individual variable used in this study the following basic equations ten model was estimated. Based on those model, the following equations were analyzed

- Log TTR_t = a₀ + a₁ LOG GDP + U_t 1
- Log TOR_t = a₀ + a₁ log GDP + U_t 2
- Log PPT_t = a₀ + a₁ log TOR + U_t 3
- Log PPT_t = a₀ + a₁ log GDP + U_t 4
- Log CIT_t = a₀ + a₁ log GDP + U_t 5
- Log CIT_t = a₀ + a₁ log NGDP + U_t 6
- Log CED_t = a₀ + a₁ log GDP + U_t 7
- Log CED_t = a₀ + a₁ log IMP + U_t 8
- Log VAT_t = a₀ + a₁ log GDP + U_t 9
- Log VAT_t = a₀ + a₁ log VFG + U_t 10
- Log IMP_t = a₀ + a₁ log GDP + U_t 11
- Log NGDP_t = a₀ + a₁ log GDP + U_t 12
- Log VFG_t = a₀ + a₁ log GDP + U_t 13

Buoyancy of tax o Base

$$\text{Log } T_t = \log a + a_1 \log B_t + U_t$$

Where

$$TB = \frac{\% \Delta \text{Revenue}}{\% \Delta \text{Base}}$$

Buoyancy of the Base to income is given as

$$\text{Log } B_t = \log a + b_1 \log GDP_t + U_t$$

Where

$$\frac{\Delta \text{Base}}{\Delta \text{GDP}}$$

The Buoyancy of the tax to income is obtained as:

$$Y_t = \left[\frac{\Delta T}{\Delta Y} \right] \left[\frac{Y}{T_n} \right]$$

$$\text{Log } U_t = \log a + \beta_1 \text{ GDP} + U_t$$

Where:

- PPT = Petroleum Profit Tax
- TOR = Total Oil Revenue
- TTR = Total Tax Revenue
- CIT = Company Income Tax
- CED = Custom and Excise Duties
- VAT = Value Added Tax
- VFG = Value Finished God
- TIMP = Total Import

NGDP	=	Non Oil Gross Domestic Product
GDP	=	Gross Domestic Product
$a_0 - J_0$	=	Constant Autonomous Term
$a_1 - j_1$	=	Coefficient of Buoyancy
U_t	=	Stochastic Error Term

The choice of Buoyancy is also premise on the deficiencies observed in purging tax revenue of the impact of discretionary tax changes. Like the Sahota (1961) model, proxy bases were also adopted for the buoyancy methodology. The proxy which include, PPT was Total Oil Revenue, company income tax is non oil GDP VAT is total value of finished goods produced. The model utilized in our evaluation of the ability of the tax system to generate expected revenue is the buoyancy criteria, this is due to the fact that within the period under review, no tax policy was promoted, only discretionary tax change which have been an annual phenomenon in the Nigeria's budgetary process and rise in tax revenue due to economic growth.

4. Data Presentation and Analysis

This section discusses the result of the model estimation conducted. The data were subjected to a buoyancy test to determine the leading or logging tax revenue with respect to their contribution to total tax revenue collected.

Table 2. Estimates of tax buoyancy (1993 – 2012)

	Buoyancy	R.sq(adj)	D.W	p-value.
Petroleum Profit Tax	.73	.76	1.52	0.000
Company Income Tax	1.13	.98	.92	0.000
Customs & Excise Duties	.73	.91	.52	0.000
Value Added Tax	1.85	.61	1.20	0.000
Total Tax Revenue	.80	.95	1.41	0.000

Table 3. Estimate of buoyancy of tax base

	Buoyancy	R.sq(adj)	D.W	p-value.
Total tax revenue	.34	.61	1.03	0.000
Total imports	.65	.93	.67	0.000
Non oil GDP	.88	.72	1.22	0.000
Value of Finished Goods	2.09	.52	1.16	0.000

Table 4. Estimate of buoyancy of individual tax revenue to their respective base

	Buoyancy	R.sq(adj)	D.W	p-value.
Petroleum profit tax	1.66	.71	1.30	0.000
Company income tax	.99	.76	1.05	0.000
Custom and Excise duties	1.13	.99	.64	0.000
Value Added Tax	.82	.99	1.08	0.000

The result of the general regression model revealed that for the period under study, all the explanatory variable adequately explain the pattern of behavior of each dependent variable. Durbin Watson(DW) statistics show that there is a positive autocorrelation.

From Table 2, the coefficient of all the equations result of all the equations results regarding individual tax sources were all significant at 95 level of significant R- sq(adj) are high. The buoyancy result showed that PPT, CED and TTR were negative as they are less than unity. This result is akin to the one obtained by Ariyo(1997), Dickson and Presley (2013). Value Added Tax and company income tax exhibite a buoyancy excess of unity (1.85 and 1.13

respectively). The negative result of TTR indicates that the tax revenue collection is negatively responsive to changes in GDP. The negative result of some of the tax base to GDP can be attributable to poor tax effort, corruption, weak administrative structure, tax evasion, reoccurring tax exemption or incentives.

Result in Table 3 reveals that all have a significant relationship with their respective tax base (GDP). This is contrary to the result reported in Table 2, only one tax base has a buoyancy exceeding unity. This low level of productivity of the Bases which naturally should have culminate in buoyant individual tax revenue in the absence of loopholes in the tax system. Dickson and Presley (2013) attributes this shortcomings to high rate of tax evasion, misguided tax exemptions and corruption in the administration of the tax system

Table 4 result showed that the result of buoyancy of individual tax revenue to their respective Bases contrary to all the previous analysis result, PPT and CED showed a Buoyancy result which is above unity, while CIT and VAT showed a buoyancy result that is below unity. Daub in Watson (DW) statistics showed the presence of autocorrelation and the p-value showed the all have significant relationship with their respective Bases (there is a significant relationship between the tax revenue and tax Base. (Note the value of vatable finished goods was determined by the author)

5. Conclusions

5.1 Summary of Findings

This study was investigated the productivity of the Nigeria tax system during 1994 – 2013. The Nigeria tax system is made up of direct and indirect tax. In this study, two tax bases were chosen from each categories. Thirteen models were formulated for the study and regression was run on the logged data at all levels. The study takes cognizance of the lagged nature of some of the direct tax base (PPT and CIT).

Productivity of a tax system is measured using two approaches – income tax elasticity and tax buoyancy. Buoyancy deals with changes in tax revenue as a result of changes in tax rate and rule while income elasticity deals with changes in income and tax revenue as a result of change in economic policy. In this study, tax buoyancy was adopted.

5.2 Conclusion

During the period under study, no major economic policy was introduced or changed, though some tax rate and rule changes in accordance with macro economic goals set out in the budget annually.

The result of the analysis revealed that two out of the four tax base have buoyancy above unity with VAT as the most buoyant among all. This support the thinking that it will constitute a major source of revenue generation in both short and long run to meet government spending requirement.

Finding of the productivity of VAT is in line with earlier studies by Omojimito and Godwin (2012), Dickson and Presley (2013). The improvement in the buoyancy of some of the tax bases (PPT, CED, CIT) within the period under study may be attributable to the implementation of the 1992 study group recommendation on efficient tax administration and various efforts to block various existing loopholes in the tax system. The buoyancy result is quite different from the result of previous studies especially that of Omojimito and Godwin (2012), Dickson and Presley (2013) due to the period of coverage, estimation approach and probably dearth of data. The improvement on the productivity level can be enhanced by adoption of sound policy that will reduce the tax administration inefficiency, block loopholes, tax evasion and eliminate corruption within the tax system.

5.3 Recommendations

Based on the findings, the study recommends the following:

- That the government should improve the tax administrative system so as to block possible tax evasion by appropriate by policing of exports and import.
- Lowering the company income tax rate further to encourage more investment to broaden the tax base and promote economic growth.
- Government should broaden the tax base by providing the basic infrastructure and enabling environment for private enterprise to thrive.
- Prudent management and productive utilization of public fund should be encouraged.

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