An Empirical Study on the Causality between Economic Growth and Taxation in Nigeria

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Abstract: This study examines the causality between economic growth and taxation in Nigeria for the period 1970-2009. To achieve the objective of the study, data was collected from the Central Bank of Nigeria (CBN) Statistical Bulletin and Federal Inland Revenue Service (FIRS). The data collected from the secondary sources were analysed using relevant econometric models such as Augmented Dickey-Fuller, Diagnostic Tests, Granger Causality and Johansen Co-integration. The results from the econometric analysis reveals that taxation as an instrument of fiscal policy affects the economic growth and taxation granger cause economic growth of Nigeria. On the basis of the econometric result, the study concluded that taxation is a very important instrument of fiscal policy that contributes to economic growth of any country. On the basis of the conclusion useful recommendations were provided that will improve the generation of revenue from taxation that would stimulate the economy of Nigeria positively.

Key words: Company income tax, economic growth, Nigeria, petroleum profit tax, tax

INTRODUCTION

Taxes are levied on individuals, groups, business or corporate bodies, by constituted authorities for funds used by state in the maintenance of peace, security, economic growth and development and social engineering among others for the benefit of the citizenry. According to Appah (2004), taxation is a compulsory levy imposed on a subject or upon his property by the government to provide security, social amenities and create conditions for the economic well-being of the society. Also Bhartia (2009) argues that a tax is a compulsory levy payable by an economic unit to the government without any corresponding entitlement to receive a definite and direct quid pro quo from the government.

The economic history of both developed and developing countries, reveals that taxation is an important weapon or instrument in the hand of government; not only to generate revenue, but also to create fiscal goals that influences the direction of investment and taming the consumption and production of certain goods and services. It is on the basis of this that Anyanwu (1997) and Anyafo (1996) argues that taxes are imposed to regulate the production of certain goods and services, protection of infant industries, control business and commerce, curb inflation, reduce income inequalities etc. Historically, taxation constitutes the oldest instrument of financing the public sector in times of either peace or war. For sacrificing their private resources to the state in form of taxes, citizens expect the government to reciprocate by spending public revenue in a way that will enhance their welfare. This is why scholars have divided the issue of public finance into two aspects this is revenue and expenditure (Musgrave and Musgrave, 2004). In 1776 during the era of Adam Smith, the place of taxation in public finance has caught the attention of experts like David Richardo, another classical economist who did argue that an economic principle could only be considered useful if it directs government to the right measures of taxation (Jhingan, 2004a).

However, taxation is a tool by government in fashioning various aspects of economic growth. According to Tosun and Abizadeh (2005), taxes are instrument of fiscal policy. They outlined five possible mechanisms by which taxes can affect economic growth. First, taxes can inhibit investment rate through such taxes as corporate and personal income, capital gains taxes. Second, taxes can slow down growth in labour supply by distorting labour-leisure choice in favour of leisure. Third, tax policy can affect productivity growth through its discouraging effect on research and development expenditures. Fourth, in a Harbenger framework, taxes can lead to a flow of resources to other sectors that may have lower productivity. Finally, high taxes on labour supply can distort the efficient use of human capital high tax burdens even though they have high social
productivity. Engen and Skinner (1996) suggest that a number of recent theoretical studies have used endogenous growth models to stimulate the effects of a fundamental tax reform on economic growth. All of these studies conclude that reducing the distorting effects of the current tax structure would permanently increase growth. Anyanwu (1997) opine that in practice, it is difficult to distinguish between the effects of tax policy on levels and on growth rates of GDP. This is because transitional growth may be long-lasting and so it has not proved possible to distinguish effects on long-run growth from transitional growth. For instance, it is possible that tax changes that encourage innovation and entrepreneurship may have persistent long-run growth effects, while those that affect investment also can have long lasting effects on growth that fade out in the long run.

Economic growth has received much attention among scholars. According to Appah (2010), classical studies estimate that economic growth is largely linked to labour and capital as factors of production. The emergence of the endogenous growth theory has encouraged specialists to question the role of other factors in explaining the growth phenomenon (Bogdanov, 2010). Therefore, taxation is considered as an instrument of fiscal policy an important variable which may determine changes in national income in developing countries like Nigeria. Increased taxation on imported goods and services have affected the level of such goods and services that industrialist within our sovereignty are encouraged to produce. And because of high import duty on dairy products, textiles, materials, food products etc our economic potential are encouraged through industrial investment locally and the multiplier effect on employment and national growth. Also, high tax rate imposed on imported components of oil industrial inputs and the encouragement of local content in the oil industry are all geared towards increasing economic growth in Nigeria.

The findings of Devereux and Love (1995) explore that a permanent increase in the share of government spending in income that is financed with lump-sum taxes will endorese interest and long run growth rate when it is funded with an income tax while a temporary rise increases output but has no impact on long-run growth rate. It is also claimed that government spending may increase growth rates only if it is financed with a tax-smoothing policy. Tomljanovic (2004) have tested empirically whether tax revenue has transitory or permanent impact on the growth rate of output. However, all these studies deal with only developed economies. Therefore, this gap in existing literature on tax revenue and economic growth needs to be filled.

Consequently, an efficient and effective tax administration results in increased revenue yield, but this is not possible because of the presence of evasion and avoidance due to loop holes in the tax laws. On the other hand, people do not expect that by sacrificing their private resources the state in the form of taxes, government is expected to reciprocate by spending public revenue in a way that will enhance their welfare. But government and tax collectors have been dubiously mismanaging the public treasury. There is high level of manipulation and diversion of tax revenue by the collectors. The dwindling tax revenue as presently witnessed results from lack of encouragement to the taxpayer, due to the fact that there is very little evidence to show for taxes collected. For these reasons, there are increased cases of tax evasion.

An important research issue arising from Barro’s tax-smoothing hypothesis insights is: whether, the tax policies adopted by a government effects its output growth permanently or transitarily? A prominent feature of the endogenous growth theories is permanent change in some variable that is potentially influenced by government policies cause permanent changes in the growth rate. The policy effect in the endogenous growth models is contradictory to that of neo-classical growth models (exogenous models). The later anticipate that such changes will alter growth rate only temporarily. The endogenous growth models argue that financing through taxes may have an impact on welfare and/or on growth. Tax policy can affect economic growth by discouraging new investment and entrepreneurial incentives or by distorting investment decisions. Therefore, future economic output would be higher with the optimal rate of taxation and hence future tax revenues would be higher with a lower rate of taxation (Kiabel and Nwikpasi, 2009).

The objective of this study is to examine the causality between economic growth and taxation in Nigeria for the period 1970-2009. To achieve this objective, the study is divided into five interconnected sections. The next section examines the literature review of taxation and economic growth; the third section contains the materials and methods used in the study. The fourth section examines the results and discussions. The final section examines the concluding remarks and recommendations.

**LITERATURE REVIEW**

The achievement of macroeconomic objectives of full employment, stability of price level, high and sustainable economic growth and external balance, from time immemorial, has been a policy priority of every economy whether developed or emerging given the susceptibility variables to fluctuations in the economy. The achievement of these objectives undoubtedly is not automatic but requires policy guidance. According to Olawummi and Ayinla (2007), this policy guidance represents the objective of economic policy. Therefore, fiscal and monetary policy instruments are the main instruments of achieving these goals. The main fiscal policy instruments are taxation and public expenditure while monetary policy
instruments are reserve requirements, discount rates and open market operations. This study examines the effects of taxation on economic growth in Nigeria.

A taxation theory may be derived on the assumption that there need not be any relationship between tax paid and benefits received from state activities. There are two theories, namely,

- The socio-political theory
- The expediency theory (Anyafo, 1996; Bhartia, 2009)

A taxation theory may be based on a link between tax liability and state activities. It would assume that the state should charge the members of the society for the services provided by it. This reasoning, on the one hand, justifies imposition of taxes for financing state activities and on the other, by inferences, provides a basis, for apportioning the tax burden between members of society. This logic therefore, yield two theories, namely,

- Benefit received theory
- Cost-of-service theory

The final theory of taxation is the ability to pay theory.

The expediency theory: This theory asserts that every tax proposal must pass the test of practicability. It must be the only consideration weighing with the authorities in choosing a tax proposal. Economic and social objectives of the state as also the effects of a tax system should be treated as irrelevant. This proposition has a truth in it, since it is useless to have a tax which cannot be levied and collected efficiently. There are pressures from economic, social and political groups. Every group tries to protect and promote its own interests and authorities are often forced to reshape tax structure to accommodate these pressures. In addition, the administrative set up may not be efficient to collect the tax at a reasonable cost of collection. Taxation provides a powerful set of policy tools to the authorities and should be effectively used for remedying economic and social ills of the society such as income inequalities, regional disparities, unemployment, cyclical fluctuations and so on.

The socio-political theory: Adolph Wagner advocated that social and political objectives should be the deciding factors in choosing taxes. Wagner did not believe in individualist approach to a problem. He wanted that each economic problem should be looked at in its social and political context and an appropriate solution found thereof. The society consisted of individuals, but was more than the sum total of its individual members. It had an existence and entity of its own which needed preservation and taking care of. Accordingly, a tax system should not be designed to serve individual members of the society, but should be used to cure the ills of society as a whole. Wagner, in other words, was advocating a modern welfare approach in evolving and adopting a tax policy. He was specifically in favour of using taxation for reducing income inequalities.

He maintained that private property and inheritance were the result of state policies and not because of any God-given rights. The State, therefore, had the right to control the ownership of property and its inheritance in the interests of the society as a whole. Wagner’s ideas, though much criticized at that time, are now the hallmark of fiscal policies of modern state.

The benefits-received theory: This theory proceeds on the assumption that there is basically an exchange or contractual relationship between tax-payers and the state. The state provides certain goods and services to the members of the society and they contribute to the cost of these supplies in proportion to the benefits received. In this quid pro quo set up, there is no place for issues like equitable distribution of income and wealth. Instead, the benefits received are taken to represent the basis for distributing the tax burden in a specific manner. This theory overlooks the possible use of the tax policy for bringing about economic growth or economic stabilization in the country.

The cost of service theory: This theory is very similar to the benefits-received theory. It emphasis the semi-commercial relationship between the state and the citizens to a greater extent. The implication is that the citizens are not entitled to any benefits from the state and if they do receive any, they must pay the cost thereof. In this theory, the state is being asked to give up basic protective and welfare functions. It is to scrupulously recover the cost of the services and therefore this theory, unlike the benefits-received one, specifically implies a balanced budget policy. In the process, the state is not to be concerned with the problems of income distribution. No effort is to be made to improve income distribution; and no notice is to be taken if the policy of levying taxes according to the cost of service principles deteriorates it further.

Ability to pay theory: This approach considers tax liability in its true form-compulsory payment to the state without quid pro quo. It does not assume any commercial or semi-commercial relationship between the state and the citizens. According to this theory, a citizen is to pay taxes just because he can and his relative share in the total tax burden is to be determined by his relative paying capacity. This doctrine has been in vogue for at least as long as the benefits theory. A good account of its history is found in Seligman. This theory was bound to be supported by socialist thinkers because of its conformity with the ideas and concepts of justice and equity. However, the doctrine...
received an equally strong support from non-socialist thinkers also and became a part of the theory of welfare economics.

The basic tenet of this theory is that the burden of taxation should be shared by the members of society on the principles of justice and equity and that these principles necessitates that the tax burden is apportioned according to their relative ability to pay.

Meaning of taxation: Taxation, in a simple language is a compulsory non-quid-pro-quo withdrawal of resources from the private sector of the economy (Nwosu, 2000). Anyanwu (1993) and Nwezeakhu (2005) stated that taxation is the compulsory transfer or payment (or occasionally of goods and services) from private individuals, institutions or groups to the government. Similarly Jhingan (2004b), Nzotta (2007), Ola (2001), Osiegbu et al. (2010), Bhartia (2009), Anyafo (1996) and Musgrave and Musgrave (2004), defined taxation as follows: “a compulsory contribution imposed by a public authority, irrespective of the exact amount of service rendered to the taxpayer in return”. “a compulsory contribution from a person to the government to defray the expenses incurred in the common interest of all, without references to special benefits conferred”.

These definitions point towards three characteristics of taxation:

- It is a compulsory contribution imposed by the government on the people residing in the country. Since it is a compulsory payment, a person who refuses to pay tax is liable to punishment. But a tax is to be paid only by those who come under its jurisdiction. Similarly, persons who buy a commodity which carries a tax on it, pay the tax while others do not.
- A tax is a payment made by the taxpayers which is used by the government for the benefit of all the citizens. The state uses the revenue collected from taxes for providing hospitals, schools, public utility services, etc. which benefit all people.
- A tax is not levied in return for any specific service rendered by the government to the taxpayer. An individual cannot ask for any special benefits from the state in return for the tax paid by him.

General principles of taxation: Classical economists, mercantilists and physiocrats enunciated the canons or principles of taxation. Adam Smith developed his famous four canons of taxation. Others like J.S. Mill, J.B. Say and A.C. Pigou considered at length the subject matter, thus the doctrines of tax principles have received considerable attention right from the infancy of public finance. According to Anyafo (1996), by principles of taxation, we mean the appropriate criteria to be applied in the development and evaluation of the tax structure. Such principles are essentially an application of some concepts derived from welfare economists. In order to achieve the broader objectives of social justice, the tax system of a country should be based on sound principles. Anyanwu (1993, 1997), Jhingan (2004b), Bhartia (2009), Osiegbu et al. (2010) listed the following as principles of taxation:

- Equality
- Certainty
- Convenience
- Economy
- Simplicity
- Productivity
- Flexibility
- Diversity

Principle of equity: Adam Smith advocated that the amount payable should be equal, by which he meant proportional to income. The idea embodies the ability to pay. Only when a tax is based on the tax payer’s ability to pay can it be considered equitable or just. Sometimes this principle of taxation is interpreted to imply proportional taxation (Anyafo, 1996). Jhingan (2004b) argues that this principle states that every taxpayer should pay the tax in proportion to his income. The rich should pay more and at a higher rate than the other person whose income is less.

Principle of certainty: According to Jhingan (2004b) and Bhartia (2009), the certainty principle of taxation means that “the tax which each individual is bound to pay ought to be certain and not arbitrary. The time of payment, the manner of payment, the quantity to be paid ought all to be clear and plain to the contributor and every other person”. Thus this principle requires that there should be no element of arbitrariness in a tax. It should be clear to every taxpayer as to what, when and where the tax is to be paid.

Principle of convenience: This principle lays down that both the time and manner of payment should be convenient to the taxpayer. In the words of Jhingan (2004b), “Every tax ought to be levied at the time or in the manner in which it is most likely to be convenient for the contributor to pay”. According to Anyafo (1996), this principle of taxation provides the rationale for the Pay As You Earn (PAYE) system of tax payable system of tax collection. PAYE is a system of paying income tax where the tax payable is deducted at source from current earnings, weekly or monthly and the employees being made to account directly to the relevant tax authority.

Principle of economy: According to Jhingan (2004b), Bhartia (2009) and Appah (2004), every tax should satisfy the principle of economy in two ways. First, it should be economical for the state to collect it. If the cost of
collection in the form of salaries of tax officials is more than what the tax brings as revenue, such a tax is uneconomical, hence it should not be levied. Second, it should be economical to the taxpayer. It means that he should have sufficient money left with him after paying the tax. A very heavy tax on incomes will discourage saving and investment and thus adversely affect the productive capacity of the community. Anyanwu (1997) argues that this principle of taxation requires taxes should not be imposed if their cost of collection was excess.

**Principle of productivity:** According Jhingan (2004b), Appah (2004), Anyanwu (1997) and Osiegbu et al. (2010), this principle of taxation states that a tax should be productive in the sense that it should bring large revenue which should be adequate for the government. But it does not mean that in its efforts to raise more revenue, the government should tax the people heavily.

**Principle of simplicity:** The tax system should be simple, plain and intelligible to the common taxpayer. The tax system should not be complicated. It should be simple to understand as to how it is to be calculated and how much it is to be paid. Anyafo (1996) argue that there should be no hidden agenda in the tax law.

**Principle of flexibility:** Flexibility principle of taxation means that there should be no rigidity in taxation. The tax system can be changed to meet the revenue requirements of the state. Bhartia (2009) states that it should be possible for the authorities without delay to revise the tax structure, both with respect to its coverage and rates, to suit the changing requirements of the economy and the treasury.

**Principle of diversity:** This principle of taxation states that there should be diversity or variety in taxation. A single or a few taxes would neither meet the revenue requirements of the state nor satisfy the principle of equity. Bhartia (2009) argues that it is risky for state to depend upon too few a source of public revenue. Such a system is bound to breed a lot of uncertainty for the treasury. It is also likely to be inequitable as between different sections of the society.

**Classification of taxation:** According to Nnamocha (2002), the amount of tax is determined by applying the tax rate to the tax base and argued that the relationship of rate to changes in tax bases is expressed in the notion of proportional, progressive, regressive and digressive taxes.

- **Progressive taxation:** This is a tax whose percentage of the tax paid increase as the income of the taxpayer increases. Jhingan (2004b) states that a progressive tax is one whose percentage rate increases as the tax base increases. In other words, as the income of a person increases, the tax rate also increases gradually and vice versa. The progressive tax has the following advantages:
  - Ability to pay
  - Productive
  - Elastic
  - Economical
  - Income inequality
  - Social justice
  - Equitable
  - Economic stability
  - Better resource use

The disadvantages include:
  - Faulty basis
  - Arbitrary
  - Discourages capital formation
  - Unjustified critics
  - Tax evasion

However, despite the above mentioned weaknesses of progressive taxation, this system in in practice in every country of the world because it confirms to the canons of productivity, elasticity and economy. It is socially and economically desirable because it removes inequality of income and wealth distribution.

- **Proportional taxation:** A proportional tax is one whose percentage rate remains the same as the tax base increases. According to Anyanwu (1997), a tax is proportional if the ratio of tax to income remains constant when moving up the income scale; that is, a tax which is levied at the same rate at all levels of income. The proportional tax system has the following merits:
  - Simple
  - Easy
  - No change in income distribution
  - Neutralizing effect
  - No-disturbing
  - Despite these advantages, the proportional tax system possesses the following disadvantages
    - Inequitable
    - Increases inequality
    - Less productive
    - Against the principle of taxable capacity
    - Bad effects on the economy.

- **Regressive taxation:** This is a tax system whose percentage rate decreases as the tax base increases. In other words, the tax rate decreases. A high-income person pays less tax than a low-income person in proportion to his income. Thus regressive taxation is just the opposite of progressive taxation.
Degressive taxation: This is a tax for which rate increases at a decreasing rate of 1% on a #1,000 base. 2.5% on #10,000 and 3.5% is digressive. Nevertheless, taxation can be classified into two broad types namely direct and indirect tax.

Direct taxation: A direct tax is really paid by the person on whom it is legally imposed. Direct taxes possess the following advantages:

- Equitable
- Certain
- Economical
- Elastic
- Simple
- Desirable
- Reduce inequality
- Civic consciousness

The disadvantages include:

- Unpopular
- Arbitrary
- Evasion
- Discourages savings and investment

Examples of direct taxes in Nigeria are:

- Personal income tax
- Companies income tax
- Capital gain tax
- Petroleum profit tax

Indirect taxation: Indirect taxation is a type of tax imposed on one person, paid partly or wholly by another, owing to a consequential change in the terms of some contract or bargain between them. The advantages of indirect tax include:

- Convenience
- Wide coverage
- Elastic
- Economical
- Diversity
- Less evasion
- Check the consumption of harmful goods

The disadvantages include:

- Uncertain revenue
- Regressive
- Uneconomical
- Bad effect on production and consumption
- Fixed inflation

Examples of indirect taxes in Nigeria include:

- Excise duties
- Customs duties
- Stamp duties
- Entertainment
- Casino tax
- Value added tax

Economic growth models: The emergence of economic growth theories can be traced back to Adams Smith’s Wealth of Nations. In Smith’s view, economic growth of a nation strictly speaking, ‘wealth of Nations’ depends on the division of labour and is limited by the limits of division of labour. The Smithian view was later superceded by the view of Richardo, Malthus and Mill. The growth theories suggested by these great economists are collectively called classical theory of economic growth. And then, during the nineteen thirties and forties, R.F. Harrod and Dumar developed a path breaking theory of economic growth-the capital accumulation theory of economic growth, popularly called Harrod-Domar growth model. The following theories of economic growth would be discussed:

Harrod-Domar Theory of Growth: The Harrod -Domar models are based on economic growth on the experiences of advanced economists. They are primarily addressed to an advanced capitalist economy and attempt to analyse the requirements of steady growth in such an economy. Harrod -Domar assign a key role to investment in the process of economic growth. But they lay emphasis on the dual character of investment. Firstly, it creates income and secondly, it augments the productive capacity of the economy by increasing its capital stock. The former may be regarded as the demand effect and the later the supply effect of investment. Hence so long as net investment is taking place, real income and output will continue to expand. However, for maintaining a full employment equilibrium level of income from year to year, it is necessary that both real income and output should expand at the same rate at which productive capacity of the capital stock is expanding. Ultimately, it will adversely affect the economy by lowering incomes and employment in the subsequent periods and moving the economy into equilibrium path of steady growth.

The Kaldor model of distribution: The Kaldor model is an attempt to make the saving-income ratio variable in the growth process. It is based on the classical saving function which implies that saving equals the ratio of profits to national income, i.e. $S = P/Y$. 
The Pasinetti model of profit and growth: The Pasinetti model is based on the Kaldor model of distribution by incorporating workers profits as returns on their savings. It shows that there exists a distribution of income between profits and wages which keeps the system in a long-run equilibrium.

Joan Robinson’s model of capital accumulation: Mrs. Joan Robinson in her book “The Accumulation of Capital” build a simple model of economic growth based on the capital rules of the game. The model is where net national income is the sum of the total wage bill plus total profits which may be shown as:

\[ Y = wN + pK. \]

Meade’s Neo classical model of economic growth: Professor J.E. Meade has constructed a neo-classical model of economic growth which is designed to show the way in which the simplest form of economic system behave during a process of equilibrium growth. In the model, the net output produced depends upon four factors:

- The net stock of capital available in the form of machines
- The amount of available labour force
- The availability of land and natural resources
- The state of technological knowledge which continues to improve through time

The Solow model of long-run growth: Solow postulates a continues production function linking output to the inputs of capital and labour which are sustainable. He shows in his model that with variable technical efficient there would be a tendency for capital-labour ratio to adjust itself through time in the direction of equilibrium ratio.

Empirical studies: Several empirical studies have been conducted on the impact of taxes on economic growth. Anyanwu (1997) in a study of the effects of taxes on Nigeria’s GDP/Economic Growth (1981-1996) reveal that companies’ income tax positively and significantly affects GDP just as do customs and excise duties. However, petroleum profit tax is positively and insignificantly affects Nigeria’s GDP. The same is true of other direct taxes (capital gains and stamp duties). However, all direct taxes positively and significantly affect Nigeria’s GDP.

Engen and Skinner (1996) in their study of taxation and economic growth of U.S economy, large sample of countries and the use of evidence from microlevel studies of labour supply, investment demand and productivity growth. Their result suggests modest effects, on the order of 0.2 to 0.3% points’ differences in growth rates in response to a major tax reform. They stated that such small effects can have a large cumulative impact on living standards.

Tosun and Abizadeh (2005) in their study of economic growth of tax changes in OECD countries from 1980 to 1999 reveal that economic growth measured by GDP per capita has a significant effect on the tax mix of the OECD countries. The analysis reveals that different taxes respond to the growth of the GDP per capita. It is shown that while the shares of personal and property taxes have responded positively to economic growth, shares of the payroll and goods and services taxes have shown a relative decline.

Arnold et al. (2011) in their study entitled “Tax policy for Economic Recovery and Growth” found that short term recovery requires increase in demand while long term growth requires increase in supply. As short term tax concessions can be hard to reverse, this implies that policies to alleviate the crisis could compromise long run growth.

MATERIALS AND METHODS

This study, time series data sourced from Statistical Bulletin, Economic and Financial Review and Annual Reports and Statement of Accounts of the Central Bank of Nigeria (CBN) of various issues were made use of. The macroeconomic data cover Gross Domestic Product (GDP), taxes for the period 1970 to 2009 in Nigeria.

The model: The model for this study uses Granger causality test to ascertain the direction of causality between GDP and TAX between 1970 and 2009. Other econometric tests such as unit root test, co-integration test and vector error correction mechanism were also performed to determine the stationarity of the data and long run relationship between the variables.

The test procedure is illustrated below:

\[
GDP_t = \sum_{j=1}^{K} A_j TAX_{t-j} + \sum_{j=1}^{K} B_j GDP_{t-j} + U_{1t} \quad (1)
\]

\[
TAX_t = \sum_{j=1}^{K} C_j TAX_{t-j} + \sum_{j=1}^{K} D_j GDP_{t-j} + U_{2t} \quad (2)
\]

Equation (1) postulates that current GDP is related to past values of itself as well as that of TAX and vice-versa for Eq. (2). Unidirectional causality from TAX to GDP is indicated if the estimated coefficient on the lagged TAX in Eq. (1) is statistically different from zero as a group (i.e., \( \sum A_i \neq 0 \)) and the set of estimated coefficients on the lagged GDP in Eq. (2) is not statistically different from 0 (i.e., \( \sum D_i = 0 \)). The conserve is the case for unidirectional causality from GDP to TAX.

Feedback or bilateral causality exists when the sets of TAX and GDP coefficient are statistically different from 0 in both regressions (Gujarati and Porter, 2009; Asterious and Hall, 2007; Wooldridge, 2006).
The more general model with instantaneous causality is expressed as:

\[ \text{GDP}_t + b_0 \text{TAX}_t = \sum_{j=1}^{J} \alpha_j \text{TAX}_{t-j} + \sum_{j=1}^{J} \beta_j \text{GDP}_{t-j} + U_{it} \tag{3} \]

\[ \text{TAX}_t + c_0 \text{GDP}_t = \sum_{j=1}^{J} \alpha_j \text{TAX}_{t-j} + \sum_{j=1}^{J} \beta_j \text{GDP}_{t-j} + U_{2t} \tag{4} \]

Instantaneous causality occurs and knowledge of GDP will improve prediction or goodness of fit of the first equation for TAX. In this study, a bivariate regression of the form presented below is estimated:

\[ \text{TAX}_t = \beta_0 + \beta_1 \text{TAX}_{t-1} + \ldots + \beta_k \text{TAX}_{t-k} + \beta_1 \text{GDP}_t - 1 + \cdots + \beta_1 \text{GDP}_t - 1 + U_{it} \tag{5} \]

\[ \text{GDP}_t = \beta_0 + \beta_1 \text{GDP}_{t-1} + \cdots + \beta_1 \text{GDP}_{t-1} + \beta_1 \text{TAX}_{t-1} + \cdots + \beta_1 \text{TAX}_{t-1} + U_{2t} \tag{6} \]

The equation for the second model is stated thus:

\[ \text{GDP}_t = f(\text{TAX}_t) \tag{7} \]

\[ \text{GDP}_t = \alpha + \beta_1 \Delta + \beta_2 \text{TAX}_t + \beta_3 U_{t-1} + \Sigma \tag{8} \]

To avoid spurious regression outcomes on time series data, unit root test that affirms the stationary of the series and co-integration test that affirms at least one co-integration equation were conducted. Sequel to the above, the OLS in Eq. (8) is re-specified to take care of possible short term disequilibrium as follows:

\[ \Delta \text{GDP}_t = \alpha + \beta_1 \Delta + \beta_2 \text{TAX}_t + \beta_3 U_{t-1} + \Sigma \tag{9} \]

**Test for stationarity:** To avoid spurious regressions which may arise as a result of carrying out regressions on time series data without subjecting them for test whether they contain unit root, we first subject the data to stationarity test by using the Augmented Dicker Fuller (ADF) tests. The econometric views (E-views package was employed) to carry out the regressions.

**RESULTS AND DISCUSSION**

This section provides the results and discussion of the study. The tables below shows the various results from the e-view analysis of the secondary data generated from the Central Bank of Nigeria (CBN) and Federal Inland Revenue Service (FIRS).

The Table 1 shows the Breusch-Godfrey Serial Correlation LM test for the presence of autocorrelation. The result of the test shows that the p-value of 0.257936 about 26% is greater than the critical value of 0.05 (5%). This shows the non existence of autocorrelation.

The White Heteroskedasticity test above shows that the p-value of about 0.355681 and 0.325201 is more than the critical value of 0.05, that is, we accept that there is no heteroskedasticity. This shows that there is no evidence of heteroskedasticity since the p-value are considerably in excess of 0.05 (Table 2).

Table 3 shows that the Ramey RESET test shows that the p-value of about 23% (0.228715) is greater than the critical value of 0.05. This shows that there is no apparent non-linearity in the regression equation and it would be concluded that the linear model is appropriate.

Table 4 shows the unit root test for stationarity using Augmented Dickey-Fuller. The result suggest that all the variables are stationary at 1(1) except Petroleum Profit Tax (PPT) series -4.084389, -3.806313, -4.641115, -4.857381, -5.055948, -5.069583 for gross domestic product, petroleum profit tax, tax on petroleum, companies income tax, customs and excise duties, personal income tax. All the variables were significant at 1 and 5%.

The Table 5 for Johansen Cointegration reveals the existence of a cointegrating equation in each case. The likelihood ratios of 247.1578, 136.9399, 86.39395, 7.17967 and 5.400347 are greater than the 5% critical value of 94.15, 68.52, 47.21, 29.68, 20.04 and 15.41. This result shows that there exists a long run equilibrium relationship between GDP and the fundamentals used in the model.
Table 6: Pairwise granger causality tests

<table>
<thead>
<tr>
<th>Null hypothesis:</th>
<th>Obs</th>
<th>F-statistic</th>
<th>Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPT does not granger cause GDP</td>
<td>38</td>
<td>0.43344</td>
<td>0.65191</td>
</tr>
<tr>
<td>GDP does not granger cause PPT</td>
<td>0.43698</td>
<td>0.01967</td>
<td></td>
</tr>
<tr>
<td>TOP does not granger cause GDP</td>
<td>4.56926</td>
<td>0.07771</td>
<td></td>
</tr>
<tr>
<td>GDP does not granger cause TOP</td>
<td>0.00236</td>
<td>0.02764</td>
<td></td>
</tr>
<tr>
<td>CIT does not granger cause GDP</td>
<td>38</td>
<td>0.54352</td>
<td>0.53227</td>
</tr>
<tr>
<td>GDP does not granger cause CIT</td>
<td>0.46406</td>
<td>0.03276</td>
<td></td>
</tr>
<tr>
<td>CED does not granger cause GDP</td>
<td>38</td>
<td>0.09715</td>
<td>0.05852</td>
</tr>
<tr>
<td>GDP does not granger cause CED</td>
<td>0.10988</td>
<td>0.02627</td>
<td></td>
</tr>
<tr>
<td>PIT does not granger cause GDP</td>
<td>38</td>
<td>5.04352</td>
<td>0.06024</td>
</tr>
<tr>
<td>GDP does not granger cause PIT</td>
<td>0.01421</td>
<td>0.03590</td>
<td></td>
</tr>
</tbody>
</table>

E-view output

The Table 6 shows the Granger Causality tests for the relationship between economic growth and taxation. The result shows that Petroleum Profit Tax (PPT), Taxes on Petroleum (TOP), Companies Income Tax (CIT), Custom and Excise Duties (CED) and Petroleum Profit Tax (PPT) granger cause GDP. This implies that taxation impacts on the economic growth of Nigeria.

These findings are in consonance with the studies of Engen and Skinner (1996), Anyanwu (1997), Tosun and Abizadeh (2005) and Arnold et al. (2011) among others that economic growth measured by GDP has a significant effect on tax. Jhingan (2004b) and Bhartia (2009) also stated that taxation is an instrument of fiscal policy that is used to stimulate the economy therefore contributing to economic growth.

CONCLUSION AND RECOMMENDATIONS

The purpose of this study is to investigate the causality between economic growth and a range of taxation variables in Nigeria. To capture this, time series macroeconomic data were culled from 1970-2009. The econometric analysis reveals that a long run relationship exists between economic growth and taxation in Nigeria. The Johansen Co-integration test affirmed that a long run relationship exists between the explanatory and explained variable. The Granger causality result also confirms the relationship between taxation and economic growth. Therefore, the following recommendations were provided to improve the taxation structure in Nigeria:

- The government in Nigeria should restructure the tax system to meet the demands of the 21st century.
- The level of corruption in the management of tax revenue should be minimized to achieve the goals of a good tax system.
- The level of tax evasion in Nigeria should be reduced through an efficient and effective tax administration.
- The economy of Nigeria should be restructured for taxation to play a major source of non-oil revenue.
- There should be accountability and transparency from government officials on the management of revenue derived from taxation and also citizens should be able to benefit from the payment of taxes.

REFERENCES


