

# Tax Revenues, Duties and Public Expenditure: Nigerian Evidence

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## Abstract

This study evaluates the influences of various Tax revenues and duty elements on public expenditure in Nigeria over the period of 1994 to 2016. The study employs the stationarity test, the Co-integration, Error Correction estimate and the Granger Causality test. Due to the relatively short period considered by the study, it employs the Auto regressive Distributive Lag model. The lag length selection criteria showed the sufficiency of the first lag for the employed model since revenues of previous period may be expended in future periods. It is discovered in the long run that Petroleum Profit Tax, Company Income Tax and Value Added Tax revenue sources contribute significantly to the expenditure pattern of the government. Unidirectional causal relationship abound and spilled from Petroleum profit Tax and Company Income tax to Government Expenditure while bidirectional causal relationship is seen between Personal Income Tax and Government Expenditure and Valued Added Tax and Government Expenditure. It was also observed that the trend of government expenditure is largely independent of Capital Gains Tax and Custom and Excise duties. This is linked to insufficient funds accruing to the identified tax revenue and duties sources. Freidman's Tax leading hypothesis is imminently represented as Petroleum Profit Tax and Company Income Tax are seen to be leading and determining the expenditure pattern of the public sector. Although, the above shows the dependence of government expenditure largely on the natural resource of the nation (crude oil) and the corporate firms. It is therefore recommended that (i) the public sector should ensure a fluid budgetary process to ensure easier transition and benefit from revenues via government expenditures and (ii) the custom and excise duties should be reformed to ensure proper remittances and adequate collection plans.

**Keywords:** Tax, Duties, Revenue, Public Expenditure.

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## INTRODUCTION

Government expenditure on various public endeavors can foster long-term economic growth. However, the appropriate strategy to fund such productive government expenditure may depend on a particular country's fiscal position. Hence, the economic impacts of public expenditures may not only depend on how that investment is funded, but also on the size of the existing level of various taxes and duties [1]. Recently, there exists a growing disparity between nation's revenue and expenditure. This phenomenon is seen to be most prevalent in developing economies. The nature of relationship between government revenue and expenditure has important implications for the political economy of fiscal policies in the field of public finance, since a balanced fiscal measure is a crucial ingredient in economic growth. Also, the growing spate of recent budget deficit in developing nations especially in

Nigeria necessitates such evaluations as emphasized by Rahman and Wadud [2].

To ensure budget sustainability, governments try to balance spending, taxation, and borrowing patterns and to modify policies to satisfy its long run budget constraints. Castro and cos [3] elucidates on the fact that a strong budget sustainability means that no problem in deficit behavior is expected, and there is no need for structural fiscal reforms. In contrast, weak sustainability implies that government might have a problem in marketing its debt. Due to the nature of Taxes, Duties and expenditures, the government in Nigeria takes transparency and accountability in treasury management very seriously. The implementation of a treasury single account to receive revenues and monitor financial flows at the center, high level probe of government contracts and physical and forensic accreditation of staff to detect ghost workers

are key ways that show that new government in Nigeria is determined to ensure efficiency and effectiveness in financial and economic management [4].

In Nigeria, it can be identified on one hand that taxes has been an important source of government revenue and the most dependable source of government funding. In many countries, tax relief has become a significant tool to boost the economic growth. While on the other hand, Spending increases every year in Malaysia as well as throughout most of the world. However, the question here is whether sufficient resources are available to fund these expenditures [5].

A crucial angle to explain the argument of this study is based on the endogenous growth model and the neoclassical growth model which explains that growth or changes in government drives revenue collection sources. This implies that there is a theoretically founded unidirectional relationship between the Tax/duties revenue and Government aggregate Expenditure. It suggests that every increase in revenue collection should lead to an increase in government spending especially in the short term. Although during long-term frameworks, there is inconsistency in this relationship between the Tax and expenditure which varies based on the economic status, management and situation. This therefore constitute the point of departure of this study. Nwosu and Okafor [6] explains that the underlying relationship becomes further cloudy in light of four fundamental hypotheses which are; the revenue-and-spend hypothesis, the spend-and-revenue hypothesis, the fiscal synchronization hypothesis or the fiscal neutrality hypothesis and the institutional separation hypothesis. In other to test the validity of these hypotheses, many authors have employed different methodologies, and their results have shown conflicting outcomes as shown in the literature.

The growing disparity between revenue and expenditure in many countries has been a source of concern to many economists, analysts and researchers. This has led to the prevalence of a budget deficit in Nigeria. This argument is based on the disadvantages of budget deficit, which can increase taxation in the future, thus burdening future generations [7]. Abdul Rasheed [8] also observes that Oil revenue has remained the major source of revenue to Nigeria over decades, over reliance on oil has therefore crippled other potential sources of revenue. The recent dwindling in oil revenue due to series of factors such as vandali Zation, oil theft, mismanagement, non-remittance, connivance and general corrupt practices etc. has open up avenue for other non-oil sector to be explored, which includes taxes, customs duty and tariff, fees, penalties among others. Such fiscal imbalances with attendant adverse effect on the Nigerian economy provokes studies which needs to evaluate the nature of relationship between Government taxes, duties and expenditure in Nigeria.

In this light, this study would examine tax and duties types such as Petroleum Profit Tax (PPT), Personal income Tax (PIT), Company Income Tax (CIT), Capital Gains Tax (CGT), Custom & Excise Duties (CED) and Value Added Tax (VAT) which would be taken against Total Government Expenditure (TGE) entailing both the Recurrent and capital expenditure of Nigerian Government. The study will cover a period of 1994 to 2016 as a result of initial declaration of the Value Added Tax which was enforced by the Value Added Tax Act of 1993.

The empirical findings of this study would assist in determining appropriate policy measures to address some of the fiscal challenges facing Nigeria. Fiscal operations over the years have resulted in varying degrees of deficit [9]; the financing of which has had tremendous implications for the economy. The study makes a modest contribution to the body of knowledge on the nexus between government revenue and government expenditure, using Nigerian data.

Following this introduction, section two reviews some of the relevant theoretical and empirical literature on the issue, while section three underlying methodology of the study. Section four presents the results and discussions. Section five concludes the study and offers some recommendations.

## THEORETICAL FRAMEWORK AND REVIEW OF PREVIOUS STUDIES

### CONCEPTUAL CLARIFICATIONS

Taxes and Duties in Nigeria exists in various dimensions as predicated on various acts. The study evaluates Petroleum Profit Tax (PPT), Personal income Tax (PIT), Company Income Tax (CIT), Capital Gains Tax (CGT), Custom & Excise Duties (CED) and Value Added Tax (VAT) in Nigeria as presented below.

### Value Added Tax revenue

The adoption of VAT was an important landmark in tax reforms in Nigeria. VAT is a form of consumption tax on all business profits and labor. It is levied on the value-added to the product at each stage of the production and distribution cycle as well as the price paid by the final consumer. VAT was invented by a French Economist named Maurice Laure in 1954. It was initially meant to cover large businesses, but was later extended to all businesses. By the end of the 20th century, it has been adopted throughout the European Union and many countries in Africa, Asia and South America [10].

In Nigeria, VAT came into operation in 1994 through the VAT Act, No. 106 of 1993. According to Adereti, Sanni & Adesina [11], it was introduced by the federal government of Nigeria to replace Sales tax. The aim was to increase the revenue base of government and make funds available for development purposes that will accelerate economic growth. Since its

inception, 15 out of the 42 sections of the Act have been amended. VAT was originally imposed on 17 categories of goods and 24 services. Such items as basic food, medical and pharmaceutical products, books, newspapers and magazines, house rent, commercial vehicles, spare parts and services rendered by the community and people's banks are VAT free [12].

### Customs and Excise Duties

These are the oldest forms of modern taxation which dates back to the 19th century. Custom duties otherwise known as import duties, are taxes on imports charged either as a percentage of the value of imports or as fixed amount on specified quantity. According to Odusola [13], custom duties are the highest yielding indirect tax. The tax is administered by the Nigerian Custom Services (NCS). Excise duties were introduced in 1962 as taxes imposed on the output of manufactured goods.

### Personal Income Tax

Adebisi and Gbegi [14] define personal income tax as a tax levied on employment income and any other income received by individuals. Individuals here being those in paid employment and those in self-employment, i.e. those engaged in a trade, business, profession or vocation such as lawyers, accountants, doctors, traders in shops etc. The assessment and collection of this tax in Nigeria is regulated by the Personal Income Tax Act No. 104 LFN, 1993. It is this law that gives the necessary procedures and administrative powers to impose and collect taxes from persons, individuals, partnerships, executors, trustees Family or Communities Corporation sole or body of individuals. Personal Income Tax is collected by the various state governments through the State Board of Internal Revenue (SBIR) from individuals resident in the tax territory. Taxes from certain categories of individual - members of the Armed Forces, the Nigeria Police, FCT residents, External Affairs Officials and nonresident individuals- are collected by the Federal Government via the Federal Board of Inland Revenue (FBIR).

According to Adebisi and Gbegi [14], the following taxes/levies are collectible by State Governments in Nigeria: i Personal Income Tax: a. Pay-as-you-earn (PAYE), b. Direct (Self and government) Assessment c. Withholding Tax (individuals only). ii Capital Gains Tax (Individuals only) iii Road Taxes iv Stamp Duties (instruments executed by individuals); v Pools Betting and Lotteries, Gaming, and casino Taxes; vi Business premises registration and renewal levy.

### Petroleum profit Tax

PPT is a tax on the income of companies engaged in upstream petroleum operations *in lieu* of CIT. The Petroleum Profit Tax Act 1959 (PPTA) provides for the imposition of tax on the chargeable profits of companies that are engaged in petroleum

operations in Nigeria. Petroleum operations is defined under the PPTA as "the winning or obtaining oil in Nigeria by or on behalf of a company for its account by any drilling, mining, extracting or other like operations or process, not including refining at a refinery, in the course of a business carried on by the company engaged in such operations, and all operations incidental thereto and any sale of or any disposal of chargeable oil by or on behalf of the company" Nigeria economy is dependent on oil, as it cannot finance social and economic growth in the absence of a large oil revenue base. Oil accounts for about 90-95% of the export revenue, over 90% of foreign exchange earnings and about 80% of government revenue. The oil industry is thus the hub of the Nigerian economy, and needs to be sustained if the country is to achieve real economic growth. According to Nwete [15], the oil glut of the 80's that greatly impacted on global oil prices and the low OPEC quota, foisted on the country various fiscal regime for petroleum especially the petroleum profit tax of 85% and 20% royalty regime, all in a bid to get more revenue to oil the nation's economy. Since then Nigeria has had lofty aims for its oil industry, including the desire to increase reserve from 34billion barrels to 40billion barrels by 2010 and subsequently its OPEC quota, optimization of oil revenue, increase in the industry's local content, and continuous attraction of foreign investment as a way of promoting and sustaining investment in the oil industry.

### Company Income Tax

Resident companies are liable to CIT on their worldwide income while non-residents are subject to CIT on their Nigeria-source income. The CIT rate is 30%, assessed on a preceding year basis (i.e. tax is charged on profits for the accounting year ending in the year preceding assessment). Investment income paid by a Nigerian resident to a non-resident is sourced in Nigeria and subject to WHT at source, which serves as the final tax [16].

### Personal income Tax

The Personal Income Tax (PIT) is the most common tax type in the country. The rate of Personal Income Tax payable is dependent on the amount of 'taxable income' which the person is liable for. Taxable income refers to the base upon which the income tax system imposes and decides on how much tax a person is to pay in a given calendar year. Generally, it includes some or all items of income less expenses and other deductions. The Personal Income Tax Rate in Nigeria stands at 24 percent. Personal Income Tax Rate in Nigeria averaged 24.00 percent from 2011 until 2016, reaching an all-time high of 24.00 percent in 2012 and a record low of 24.00 percent in 2012.

## THEORETICAL FRAMEWORK

The causal relationship between revenues and government expenditure is a classic problem of Public

Economics. In line with Mehrara, Pahlavani and Elyasi [17], it can be observed that there are four propositions that can potentially explain observed spending-revenue behavior. The propositions are briefly discussed as follows: Friedman leads the tax-and-spend school, which contends that raising taxes will simply lead to more spending. Friedman puts his point in the following way: "You cannot reduce the deficit by raising taxes [18, 19].

Increasing taxes only results in more spending, leaving the deficit at the highest level conceivably accepted by the public. Political rule number one is government spends what government receives plus as much more as it can get away with". Also Milton Friedman [20] suggests cutting taxes as a remedy to budget deficits, since taxes have a positive causal impact on government expenditure. According to Friedman, a cut in tax leads to higher deficits, which should influence government to reduce its level of spending [21]. Buchanan and Wagner [22] share the same view that tax lead government expenditure but that the direction of causal relationship is negative. Their point of view is that with a cut in taxes the public will perceive that the cost of government programs has fallen. As a result they will demand more programs from the government which if undertaken will result in an increase in government spending. Higher budget deficits will then be realized since tax revenue will decline and government spending will increase. Their remedy for budget deficits is therefore an increase in taxes [23].

The second school known as spend-and-tax school is built on the tenet that expenditure causes revenue proposed by Peacock and Wiseman [24, 25]. According to the spend-and-tax hypothesis, government first spends than tax policies and revenues are adjusted to accommodate the desired level of spending. They state that increases in government spending brought by crisis situations lead to permanent changes in expenditure. They are of the view that severe crisis that initially force up government expenditure, more than taxes, is capable of changing public attitudes about the proper size of government. This leads to a displacement of fiscal variables as some of the tax increases originally justified by the crisis situation become permanent tax policies [19].

Fiscal synchronization hypothesis as the third school of thought argues that governments may change expenditure and taxes concurrently [26, 27]. In this hypothesis, it is postulated that the government take decision to tax and to spend is simultaneously and changes occur concurrently and causality runs in both directions. This implies bidirectional causality between government expenditure and revenue. Under the fiscal synchronization hypothesis, citizens decide on the level of spending and taxes. This is done through comparing the benefits of government to citizen's marginal cost

[19]. Barro's [28] tax smoothing model provided further credence to the fiscal synchronization hypothesis. His model was based on the Ricardian equivalence view that deficit financed government expenditure today results in future tax increases [19]. Finally, fourth school, fiscal neutrality/independence school, proposed by Baghestani and McNown [29], in which decisions on revenue are taken independently from allocation of government expenditure, and therefore no causal relation between revenue and spending is expected. In this hypothesis, it is believe that none of the above hypotheses describes the relationship between government revenues and expenditure. Government expenditure and revenues are each determined by the long run economic growth reflecting the institutional separation between government revenues and expenditure that infers that revenue decisions are made independent are expenditure decisions

## EMPIRICAL FRAMEWORK

The causal relationship direction existent between government revenue and expenditure is yet to be empirically resolved. Many scholars have seen various relationships as summarized below;

Abdul Rasheed [8], evaluates the causality between government expenditure and government revenue in Nigeria over the period of 1986 to 2015. The study applied co-integration statistical method and vector autoregressive techniques comprising an Error Correction Model (ECM) and Augmented Dickey Fuller as the methods of analyses. The findings showed that there is spend-revenue practice in Nigeria in line with the theory of Barro [30]; Peacock and Wiseman [31] indicating that changes in government expenditure triggered changes in government revenue.

Adejare and Akande [32] evaluate the influence of personal income tax on government expenditure in Nigeria, especially in regards to Oyo state. The study employed the Pearson product moment correlation and multiple regressions. It was discovered that Personal income tax has positive significant and statistical impact on Government expenditure in Oyo State.

Aslam [33] evaluates the relationship between tax revenue and government expenditure in Sri Lanka over the period of 1950 to 2013. The study employs the co-integration test and error correction mechanism. It was discovered that there exists long run relationship between both economic phenomenon and tax revenue has sustained positive relationship with government expenditure.

Ullah [7] reviews the relationship between the revenue and the expenditure in Malaysia over the period of 2002 to 2013. The study dwells on the descriptive and analytical technique. The study finds out that although majority of the government revenue is from



direct tax, the government spending only varies due to change in indirect tax revenue and non-tax revenue.

Lojanica [34] evaluates the causality between government expenditure and government revenue in Serbia over the first month of 2003 to the eleventh month of 2014. The study employs the Unit root test, the ARDL co-integration test, the Vector error correction model and the impulse response test. The findings show that in the long run there is a unidirectional causality from government expenditures towards government revenues.

Edirisinghe and Sivarajasingham [35], examine the causal relationship between government expenditure and government revenue in Sri Lanka for the period of 1960-2013. In the process of achieving the main objective, the study uses annual data of government revenue, government expenditure and GDP deflator, and utilizes co-integration and error correction modeling framework, and Granger causality tests. The study results confirm spending-revenue hypothesis both in short run and long run.

Mainoma and Aruwa [36] using Vector Error Correction Model based causality test for the periods 1979 to 2008. Their findings showed that causality runs from revenue to public expenditure in Nigeria, their causality test and impulse response analysis confirm that government revenue has a significant impact on public expenditure in Nigeria.

Mohrara and Rezaei [37] investigate the relationship between government revenue and government expenditure in IRAN by using annual data and applying the Toda - Yamamoto Granger causality test for the period of 1978 to 2011. It is an important issue for this country but scarce empirical literature available on this issue for IRAN. The research uses the annual time series data which is obtained from the website of Central Bank. Data properties were analyzed to determine their stationary using unit root tests ADF and Zivot-Andrews unit root test which indicated that the series are  $I(1)$ . The Toda – Yamamoto Granger causality test found unidirectional causality running from government revenue to government expenditure.

Rahman and Wadud [38] analyze the direction of causal linkage between Government Expenditure (GE) and Government Revenue (GR) in Bangladesh applying Johansen's cointegration and Error Correction Mechanism (ECM) covering the period from 1973-2013. Results of the Johansen cointegration test show that a significant long-run equilibrium exists between GE and GR. Results from Granger causality test based on Vector Error Correction Models (VECM) suggest unidirectional causality from revenue to expenditure in the long run supporting Tax-and-spend hypothesis.

Luković and Grbić [39], evaluates the relationship between government tax revenue and expenditure in Serbia. The study used quarterly data from 2003 to 2014 and Toda-Yamamoto procedure. The empirical results obtained through this study show that there is a causal relation between the variables and that this relation is unidirectional from government expenditure to government revenue. This means that government expenditures lead to government revenues according to Granger and spend and tax hypothesis.

Nwosu and Okafor [6] examined the relationship between both total expenditure and total revenue in Nigeria using yearly data from 1970 to 2011. Their study employed co-integration techniques and Vector Autoregressive (VAR) models with an Error Correction term as the methods of analyses. The Co-integration tests showed the presence of long run equilibrium relationships between government revenue and expenditure variables. The VAR results also show that total government expenditure, capital and recurrent expenditures have long run unidirectional relationships with total revenue, as well as unidirectional hypothesis running from expenditure to revenue. The outcome aligned with the spend-tax hypothesis in Nigeria implying that changes in government expenditure bring about changes in government revenue.

Using the same model, Takumah [40] evaluates the long run and short run causal relationship between government revenue and expenditure in Ghana for the period of 1986-2012. There the researcher utilized ARDL bounds testing procedure for co-integration and used real GDP as the control variable. The empirical findings revealed co-integrating and bidirectional causal relationship between government revenue and expenditure both in short run and long run.

Lee, Kim and Borchering [41] evaluate the influence of tax structure on government spending in 29 OECD countries over the period of 1970 to 2007. The study employs panel causality. It was discovered that the demand for government spending markedly influences the tax structure of society.

Norris [42] evaluates the relationship between trends in public revenue and expenditure in Ireland over the period of 1997 to 2012. The study utilizes descriptive statistics and discovered that there was structural difference between patterns of revenue and expenditure over the stipulated period.

Kaya and Sen [43] evaluate the government revenue-expenditure nexus in Turkey for the period of 1975-2011 by employing co-integrated vector autoregression (VAR) method along with the Granger causality test. The findings of the analysis indicate that there is a unidirectional causality running from government spending to tax revenue and support the spend-and-tax hypothesis.

Taghavi and Ebrahim [44] show that the influence of government's expenditures on taxes in Iran. They have estimated the pattern of Iran's economy by using VAR method. The results have shown that a positive shock in government's expenditure increases taxes in Iran, while the negative shock reduces the consumption and the rate of employment.

Ogujiuba and Abraham [45] also examined the revenue-spending hypothesis for Nigeria using macro data from 1970 to 2011. Applying correlation analysis, granger causality test, regression analysis, lag regression model, vector error correction model and impulse response analysis, they report that revenue and expenditure are highly correlated and that causality runs from revenue to expenditure in Nigeria. The vector error correction model also proves that there is a significant long run relationship between revenue and expenditure.

Also, Aregbeyen and Ibrahim [46] also investigated the long run relationships and dynamic interactions between the government revenues and expenditures in Nigeria over the period 1970 to 2008. Using Autoregressive Distributed Lag experiment, the outcome showed that there is a long run relationship between public expenditures and revenues, and no evidence of a long run relationship was found. Therefore, the tax-spend hypothesis was established.

Yashobanta and Behera [47] who examined the causal relations between the government revenues and the government expenditures in India (from 1970 – 2008) with VECM model, have discovered that the causal relation is bidirectional in the long run. Their results confirm the fiscal synchronization hypothesis.

Christie and Rioja [1], evaluates the influence of taxes and bonds on government expenditure. The study utilizes a comparative evaluation and discovers that financing productive government expenditures with additional debt reduces growth in the long run. This negative impact obtains whether the economy has a high or low existing debt stock as additional borrowing not only raises current debt, but also increases debt servicing costs.

In Pakistan Ali and Shah [48] who examined government revenue and expenditure mix using yearly data for the period 1976-2009. They applied the Johansen co-integration and Granger causality techniques and discovered no relationship in the variables both in the long run and the short run granger. This result supports institutional separation hypothesis.

Mehrara, Pahlavani and Elyasi [17], examine the interrelationship between government revenue and expenditure in Asian countries over the period of 1995 to 2008. The study utilizes the stationarity test, co-

integration test and causality test in estimating the relationship. It was discovered that there is a bidirectional causal relationship between government expenditure and revenues in both the long and the short run and Fiscal synchronization hypothesis is confirmed.

Ravinthira Kumaran [49], evaluates the causal relationship between government revenue and expenditure using Engle Granger Co-integration approach and Error Correction Model for the period of 1977-2009. According to this analysis, the two variables (government expenditure and revenue) are integrated in I(1) and has found existence of long term co-integrating relationship. But when it comes to causality analysis, the study has applied level data to the Granger causality test. But the series supposed to be stationary for conventional Granger causality test, which is the major weak point of this study. This could have led misleading result. However, the study found existence of bidirectional causality between the two variables and supported the fiscal synchronization hypothesis.

Obioma and Ozughalu [50] studied the relationship between government revenue and government expenditure in Nigeria using time series data from 1970 to 2007. They utilized the Engel-Granger two-step co-integration technique, the Johansen co-integration method and the Granger causality test within the Error Correction Modeling (ECM) framework and found a long-run relationship between the two variables and a unidirectional causality running from government revenue to government in Nigeria.

Aisha and Khatoon [51], evaluates the relationship between government expenditure and revenue in Pakistan over the period of 1972 to 2007. The study employs the causality and cointegration test and discovers that the results support the Barro hypothesis that government expenditure causes revenues.

Maynard and Guy [52] investigated the interrelationship between total government expenditure and total tax revenue in Barbados over the period of 1985 to 2008 applying Granger Causality on both bivariate and multivariate co-integrating models. The result of the multivariate error correction model suggests that a unidirectional causality exists from tax revenue to government expenditure.

Eita and Mbazima [53], investigated the same causal relation in Namibia (from 1977 – 2007) using the Granger causality. According to their results, the causality is unidirectional, from government revenues to government expenditures.

Mclure and Martinez [54], evaluate the fiscal relationship between revenue and expenditure in 20

European nations over the period of 1995 to 2008. The study employs the stationarity test, simple regression and the cointegration test. The study discovers no relationship between revenues sources and expenditure in the long run.

Maghyereh and Sweidan [55] examined tax-spend, spend-tax and fiscal synchronization hypothesis for Jordan using annual time series data from 1969 to 2002. The authors used real GDP as control variable along with real government expenditures and real government revenues and Granger causality test based on Multivariate ECM. They conclude evidence in favor of bidirectional causality between revenue and expenditure. The result also suggests that there is long-run interdependence between output and fiscal variables indicating effectiveness of fiscal policy in Jordan.

Fasano and Wang [56] investigated this relationship for oil-dependent GCC countries and found evidence of unidirectional causality running from revenue to expenditure in Bahrain, the United Arab Emirates and Oman while they found bidirectional causality for Kuwait, Qatar and Saudi Arabia. They advise that the GCC countries could improve the effectiveness of their fiscal procedure by allowing budget expenditure to be less driven by revenue availability. Li [57] by applying the co integration and error correction models over the period 1950- 1997 for China found bidirectional causality between government expenditure and revenue.

Aziz and Habibullah [58] investigated causality between taxation and government spending by using an application of Toda-Yamamoto approach in Malaysia for the period 1960 to 1997. Their evidence generally supports the existence of bidirectional causality between government spending and tax revenues.

Kollias and Makrydakis [59] examined tax and spending relationship in four countries namely; Greece, Portugal, Spain, Ireland over the period of 1955 to 1993. They found that co-integration prevails in only Greece and Ireland cases and whereas there is no long run relationship in the models for Spain and Portugal. Moreover, bidirectional causality between government spending and revenue exists in Greece and Ireland. As far as Spain and Portugal cases are concerned, in the former country, causality runs from revenue to expenditure and in the later country, there is no causal link between these two important fiscal variables.

Wong and Lim [60] shows that there is a long-run relationship between government revenue and expenditure in Malaysia from 1965 to 2002. They said that in Malaysia government expenditure is determined by government revenue or government revenue leads government expenditure, which support the revenue-and-spend hypothesis. Another study by Aziz,

Habibullah, Azman and Azali [61] reported bidirectional causality between federal government revenue and expenditure of Malaysia over a different period 1960-1996. Thus, the government may not strictly stick to one rule in implementing its fiscal policy, subject to the situation of the economy and the interest of the nation to be achieved.

Owoye and Onafowora [62] evaluate the relationship between tax revenue and government expenditure in twenty-two (22) Organization for Economic Co-operation and Development (OECD) over the period of 1971 to 2010. The study employs the use of Autoregressive Distributed Lag (ARDL) bounds test and the Toda-Yamamoto Granger non-causality approach to test for causality. The study shows evidence to confirm the tax-and-spend hypothesis in eight of the twenty-two countries; but the evidence is more prevalent within the EU countries, where tax burdens are much higher, than in the non-EU OECD countries. In addition, the long-run causality results also confirm the institutional separation hypothesis in twelve countries, with two-thirds coming from the non-EU OECD countries. While we have no evidence to support the fiscal synchronization hypothesis in the long run, the short-run results show evidence of fiscal synchronization in five out of twenty-two countries.

Loganathan *et al.*, [63] reported that the government spending is directly caused by direct and indirect tax revenue and it shows a unidirectional causality running from tax revenues to government spending in Malaysia for period of 1970 – 2009. The study suggests that Malaysia government should reform taxation policies to ensure continuous tax revenue as a dominant factor cause on sustainable economic growth.

Ghartey [64] examines the causal relationship between government expenditure and revenue in four Caribbean countries. The study employs the short and long term granger causality test in the form of the Autoregressive Distributed Lag test and discovers that taxes cause spending for only Belize, and independent for the rest of the countries. Estimates of the error correction model show long-run bi-directional causation in The Bahamas, Barbados and Belize, and independent in Jamaica.

Taha and Loganathan [5] evaluates the causality between tax revenue and government spending in Malaysia over the period of 1970 to 2006. The study found a bidirectional relationship running from direct tax revenues and indirect tax revenues to government spending, but no unidirectional relationship between non-tax revenues and government spending. These results indicate that reducing direct and indirect taxes rates may lead to a fall in government spending in the future. In addition, non-tax revenues seem to be less important contributor to the successfulness of country's growth as compared to direct and indirect taxes.

The study by Narayan and Narayan [65] for twelve (12) developing countries indicates that the tax-and-spend hypothesis is valid for Mauritius, El Salvador, Haiti, Chile, Paraguay and Venezuela; the spend-and-tax hypothesis is valid for Haiti, while there is evidence of neutrality for Peru, South Africa, Guyana, Guatemala, Uruguay and Ecuador.

Study by Mithani and Khoon [66] showed that the results indicate a unidirectional causal influence from government expenditure to government revenue, supporting the spend-and revenue hypothesis in the short run. The implications of the results is that the size and growth of the public sector and consequential tax burden as well as fiscal deficit in Malaysia are largely determined by the spending decision or spending habits of Malaysian government.

Study from another ASEAN country, Indonesia, by Sriyana [67] showed that there was a strong long run relationship between tax revenue and government expenditure in Indonesia over the period 1970-2007. In the short term, the model explained unidirectional causality relationship from tax revenue to government expenditure. This phenomenon increased the budget deficit. It implies that the government should make better public finance policies supporting the tax-spend fiscal policy. From Middle East country, Al-Khulaifi [68] studied about relationship between government revenue and expenditure from 1980 to 2011 in Qatar which found unidirectional causality that runs from government revenue to expenditure in support of revenue-and-spend hypothesis.

Al-Qudair [69] studied about the relationship between government revenue and expenditure in the Kingdom of Saudi Arabia. The Cointegration test of the studies indicates the existence of long run equilibrium between government expenditure and revenue, and the causality test indicates a bidirectional causal relationship between government revenue and expenditure in both the long and short run. Fasano and Wang [56] did a research on the causality of government expenditure and revenue in oil-dependent GCC countries. The results show government expenditure follows oil revenue which support spend-and-revenue hypothesis.

Gounder *et al.*, [70] did research on the related topic in the case of Fiji Island. The study showed bidirectional causality running between government expenditure and customs duties; and in the long-run there is evidence of fiscal synchronization, implying that expenditure decisions are not made in isolation from revenue decisions.

Obioma and Ozughalu [9] examined the relationship of government revenue and expenditure in Nigeria from 1970 to 2007. The study indicates that

there is a long-run relationship between government revenue and government expenditure in Nigeria. There is also evidence of a unidirectional causality from government revenue to government expenditure. Thus, the findings support the revenue-and-spend hypothesis for Nigeria, indicating that changes in government revenue induce changes in government expenditure. Nwosu and Okafor [6] did the same study in the same country for period of 1970–2011. The study indicates, in contrary with Obioma and Ozughalu [50], long run unidirectional relationship running from expenditure to revenue variables. The findings support spend-and-revenue hypothesis in Nigeria indicating that changes in government expenditure instigate changes in government revenue. Eita and Mbazima [53] tested the relationship of government revenue and expenditure in Namibia for the period of 1977–2007. The results show a unidirectional causality from government revenue to government expenditure. It supports the revenue-and-spend hypothesis.

In Malaysia, Hong [71] uses a Johansen co-integration test and an error-correction model for causality and annual data over the period 1970 to 2007. His results show that government revenue and expenditure are co-integrated and the spend-and-tax hypothesis is confirmed. Chaudhuri and Sengupta [72], by using an error-correction model and Granger causality test for southern states in India reported that the tax-spend hypothesis is supported by the analysis and also the spend-tax hypothesis is valid for some states. Ho and Huang [73] tested the hypothesis of tax-spend, spend-tax, or fiscal synchronization applies to the 31 Chinese provinces using panel data covering 1999 to 2005. Their results based on multivariate panel errorcorrection models show that there is no significant causality between revenues and expenditures in the short run. However, in the long-run, bidirectional causality exists between revenues and expenditures, thus supporting the fiscal synchronization hypothesis for Chinese provinces over this sample period. Recently for developed country, Afonso and Rault [74] investigated causality between government spending and revenue in the EU by new econometric technical bootstrap panel analysis in the period 1960-2006. Spend and-tax causality is found for Italy, France, Spain, Greece, and Portugal, while tax-and-spend evidence is present for Germany, Belgium, Austria, Finland and the UK, and for several EU New Member States. Chang and Chiang [75] consider a sample of 15 OECD countries test for the long-run relationship between government revenues and government expenditures over the period 1992-2006. They find evidence of bidirectional causality between government revenues and expenditures, supporting the fiscal synchronization hypothesis by using panel cointegration, and panel Granger causality test techniques.

Results of the study Wolde-Rufael [76] for 13 African countries by using Toda and Yamamoto



causality test show the direction of causation are mixed and his empirical evidence suggests that there was a bidirectional causality running between expenditure and revenue for Mauritius, Swaziland and Zimbabwe; no causality in any direction for Botswana, Burundi and Rwanda; unidirectional causality running from revenue to expenditure for Ethiopia, Ghana, Kenya, Nigeria, Mali and Zambia; and an un-directional causality running from expenditure to revenue for Burkina Faso only.

In another study, Narayan and Narayan [65] found tax-and-spend hypothesis for Mauritius, El Salvador, Chile, Paraguay and Venezuela. For Haiti, there is evidence for supporting the fiscal synchronization hypothesis, while for Peru, South Africa, Guatemala, Guyana, Uruguay and Ecuador there is evidence of neutrality by application of the Toda and Yamamoto [77] test for Granger causality. Nyamongo et al., [78] investigated the relationship between government expenditure and government revenue in South Africa within the framework of a VAR approach and finds that government revenue and government expenditure have unit roots at all frequencies. The Johansen procedure test results reveal that these variables are cointegrated. It is further established that revenue and expenditure are linked bidirectional by Granger causality in the long-run, while there is no evidence of Granger causality in the short-run in South Africa. The findings of the study's Gounder *et al.*, [70] show that government revenue and government expenditure in both the aggregate and disaggregate sense are cointegrated in Fiji Islands.

In the short-run government expenditure Granger causes government revenue in an aggregate sense, departmental expenditure Granger causes aggregate revenue, and there is bidirectional causality running between government expenditure and customs duties; and in the long-run there is evidence of fiscal synchronization, implying that expenditure decision are not made in isolation from revenue decisions. Eita & Mbazima [53] by applying Granger causality test through cointegrated vector autoregression (VAR) methods for the period 1977 to 2007 in Namibia shows the unidirectional causality from government revenue to government expenditure. This suggests unsustainable fiscal imbalances (deficit) can be mitigated by policies that stimulate government revenue.

AbuAI-Foul and Baghestani [79] investigate the causal relation between government revenue and spending for Egypt for (1977-1998) and Jordan for (1975-2001). Empirical findings for Egypt indicate unidirectional causation from revenue to spending, with higher revenue leading to higher spending and indicate bidirectional causation between revenue and spending for Jordan.

Hussain [80] investigate the relationship government revenue-expenditure for Pakistan using revised estimates of expenditure and revenue from 1973 to 2003. He found evidence of unidirectional causality from expenditure to revenue in Pakistan. Maghyreh and Sweidan [55] examined tax-spend, spend-tax and fiscal synchronization hypothesis for Jordan using annual time series data from 1969 to 2002. The authors used real GDP as control variable along with real government expenditures and real government revenues and Granger causality test based on Multivariate ECM. They conclude evidence in favor of bidirectional causality between revenue and expenditure. The result also suggests that there is long-run interdependence between output and fiscal variables indicating effectiveness of fiscal policy in Jordan.

Chang and Ho [75] examined causal relationship between taxes and spend for Taiwan by using annual data over the period 1967 to 1999 and found that there is a co-integrating relationship between GDP, government revenues and expenditures in real terms. They found unidirectional causality running from revenues to expenditure. Also Chang and Ho [75] tested these propositions for China over the period 1977 to 1999 and found fiscal synchronization hypothesis. Carneiro *et al.* (2005) investigated this issue for Guinea-Bissau over the period 1981 to 2002. They found that Guinea-Bissau's experience is consistent with the "spend - tax" hypothesis. Barua (2005) examined revenue and expenditure causality in Bangladesh by using annual data over the period 1974-2004. The results of Johansen test suggest that there is a long-run relationship between government expenditure, revenue and GDP and the Granger Causality test on the corresponding Vector Error Correction (VEC) model suggests that there is no causal relationship between revenue and expenditure in the short run. It is also observed that the short run relation extends from both the fiscal variables to GDP, and not the other way around. Narayan [19] reported mixed results for the relationship between government revenue and government expenditure in nine Asian countries. (a) For Indonesia, Singapore, and Sri Lanka in the short-run and for Nepal in both the short and long-run he finds support for the tax-and-spend hypothesis; (b) Indonesia and Sri Lanka are in conformity with the spend-and-tax hypothesis in the long-run; and (c) for other countries there is evidence of neutrality. Author uses bound testing approach for cointegration and VECM for causality between the variables. However, this study was found that in three out of the nine countries government revenue and expenditure are cointegrated.

Fasano and Wang [56] investigated this relationship for oil-dependent GCC countries and found evidence of unidirectional causality running from revenue to expenditure in Bahrain, the United Arab Emirates and Oman while they found bidirectional causality for Kuwait, Qatar and Saudi Arabia. They

suggest that the GCC countries could enhance the effectiveness of their fiscal policy by making budget expenditure less driven by revenue availability. Li (2001) by applying the co-integration and error correction models over the period 1950-1997 for China found bidirectional causality between government expenditure and revenue.

Bell [81], examines the influence of taxes and bonds on government spending utilizing monthly data over the period of November 1997 to march 1998, the study employing the descriptive technique discovers that proceeds from taxation and bond sales are technically incapable of financing government spending.

Owoye [82] examined the G7 countries and discovered bidirectional relationship in five of the seven countries while in Japan and Italy he discovered causality running from revenue to expenditure. Kollias and Makrydakis [59] discovered tax and spending relationship in four countries namely; Greece, Portugal, Spain, Ireland which are comparatively poorer countries in European Union. They found that co integration prevails in only Greece and Ireland whereas there is no long run relationship in the models for Spain and Portugal. Chang *et al.*, [75] conducted a study to examine this relationship in ten industrialized countries including three newly industrialized Asian economies namely, Taiwan, South Korea and Thailand. In this study, GDP variable is also included in the model as a control variable along with government expenditures and tax variables and Johansen co-integration technique is exercised for analysis. They claimed that co integration among the variables prevails for seven countries and found causality from government revenues to government expenditures for UK, USA, South Korea, Japan and Taiwan while causality runs from government expenditures to revenues for South Africa and Australia. This study also found independence between revenues and expenditures for New Zealand and Thailand.

Shah and Baffes [83] in their study for Latin American countries concluded bidirectional causality between government revenue and expenditure for Argentina over the 1913-1984 periods and for Mexico over the 1895-1984 periods; while for Brazil they found unidirectional causality running from revenue to

expenditure. Owoye [82] investigated the issue for the G7 countries. He found bidirectional causality for five of the seven countries and for Japan and Italy he found causality running from revenue to expenditure. Ewing and Payne [84] have examined the case of five Latin American countries finding mixed results for this set of countries. The Chile and Paraguay results supported the evidence of bidirectional causality between revenues and expenditures or the fiscal synchronization hypothesis. For Colombia, Ecuador, and Guatemala they found evidence of causality from revenues to expenditures thus supporting the tax-spend hypothesis. Park [85] looked at the case of Korea and found supporting evidence for the tax-spend hypothesis over the period 1964 to 1992. Abdul Aziz and Shah Habibullah [58] investigated causality between taxation and government spending by using an application of Toda-Yamamoto approach in Malaysia for the period 1960 to 1997. Their evidence generally supports the existence of bidirectional causality between government spending and tax revenues.

Craigwell, Leon and Mascoll [86] examined government revenue and expenditure causality in the presence of seasonality in Barbados. Applying seasonal unit roots, co-integration test, Granger causality and vector error correction methodologies, their results established that the variables are significantly co-integrated, and that a unidirectional causality from government revenue to total government expenditure exists. The outcome further revealed that bivariate and multivariate techniques showed a proof of a unidirectional movement from revenue to spending.

## ORGANIZATION OF DATA AND METHODOLOGY

This study employs Ex-post facto design in evaluating the interrelationships between Tax, duties revenue and expenditure of the government in Nigeria over the period of 1994 to 2016. The study employs annualized data culled from the Federal Inland Revenue Service and the Central Bank of Nigeria statistical Bulletin.

### Data Employed and Variables description

The data employed for this study are shown in below as follows.

**Table-1: Annual values of Total Government Expenditure (TGE), Petroleum Profit Tax (PPT), Personal income Tax (PIT), Company Income Tax (CIT), Capital Gains Tax (CGT), Custom & Excise Duties (CED) and Value Added Tax (VAT) in Nigeria over the period of 1994 to 2016**

Year	TGE N'B	PPT N'M	PIT N'M	CIT N'M	CGT	CED N'M	VAT N'B
1994	55.916	42802.7	3888.2	12275	152727	18295	5.026
1995	77.896	42857.9	20436.4	21878	180130	37364	6.257
1996	83.987	76667	3407	23100	260696	55000	11.286
1997	92.686	68574.1	8339.9	27800	364829	63000	13.905
1998	143.169	68000	11400	33300	455223	57700	16.207
1999	167.896	164300	20100	46200	552608	87900	23.751

2000	359.671	525100	38100	53300	644285	101500	30.644
2001	596.956	639500	44400	69400	349441	170600	44.913
2002	724.537	392200	68100	89100	268615	181400	52.632
2003	921.160	683500	54200	114800	323306	195500	65.888
2004	1125.057	1183500	58900	113000	499154	217200	96.196
2005	1478.585	1904900	212100	140300	690152	232800	87.450
2006	1586.797	2038300	33300	244900	798214	177700	110.567
2007	2116.139	1500600	268700	275300	924164	241400	144.373
2008	3021.602	2812300	178500	450000	497841	281300	198.065
2009	2776.913	1256500	227900	630100	263460	297500	229.323
2010	3266.235	1944700	712000	712000	394230	309200	275.575
2011	3541.900	3070590	806000	806000	404344	438300	318.000
2012	3845.100	32103200	963200	963200	647073	439420	347.688
2013	4046.803	21551567	963200	8270667	510530	395267	389.526
2014	3982.998	28087189	973200	334662	716162	423956	388.850
2015	3469.160	27216252	976533	4193496	693677	419174	381.265
2016	3439.172	35688353.5	1051800	589104	728222	431442	397.064

Source: Federal Inland Revenue Services (2016).

### Specification of Analytical Tools and Tests

To evaluate the objectives of this study, the following analytical tools are employed:

#### Stationarity Tests

It is crucial to examine the stationarity qualities of time series data in order to avoid the problem of spurious estimations. In this sense, the Augmented Dick-Fuller (ADF) test is employed. For decision, the ADF statistics for the respective study variables should on absolute terms, be more than the corresponding Mackinnon critical values at 1%, 5%, and 10% levels of significance for the null hypothesis of non-stationarity to be rejected. Failure to attain stationarity of the variables would provide for subsequent differencing for stationarity to be effected.

#### Auto Regressive Distributive Lag

This is a model as developed by Pesaran *et al.* (2001) in order to incorporate I(0) and I(1). The assumption of this model stems from the fact that; it is applicable to only variables stationary at level I(0) or first difference I(1). And it is most suitable for trend whose interval does not reach 30.

#### Auto Regressive Distributive Lag Error Correction Estimation Test

The Error Correction test aims to ascertain the nature of long run sensitivities of a given study's dependent variable to changes in each of the independent variables. Also, it provides the relevant speed at which the dependent time series variable adjusts back to equilibrium within the year following short run shocks in the set of independent variables. For decision purposes, the coefficients of the independent variables are expected to be significant at 5% level for the null hypothesis of no long run sensitivity to be rejected. Further, the ECM coefficient is expected to be significant at 0.05 level and also, negatively signed for the null hypothesis of no long run proper fit to be rejected.

### The Pair-wise Granger Test

Pair-Wise Granger Causality test is employed to ascertain the extent to which changes in a paired variables set explain variations in one another and further, whether the addition of their lagged will advance the explanation. As a decision rule, their resulting t-values in the regression equation must be significant at 0.05 level for the null hypothesis of no causality to be rejected.

#### Model Specification

This study employs the following model in light of available tax and duties sources as predicated on relevant tax and expenditure theories. The general functional form of the model is stated as follows:

$$TGE = f(\text{Tax revenues, duties elements})$$

$$TGE = f(PPT, PIT, CIT, CGT, CED, VAT) \dots\dots\dots 1$$

$$TGE_t = \alpha_0 + \alpha_1 PPT_t + \alpha_2 PIT_t + \alpha_3 CIT_t + \alpha_4 CGT_t + \alpha_5 CED_t + \alpha_6 VAT_t + \mu_t \dots\dots\dots 2$$

Where:

TGE = Total Government Expenditure  
PPT = Petroleum Profit Tax  
PIT = Personal income Tax  
CIT = Company Income Tax  
CGT = Capital Gains Tax  
CED = Custom & Excise Duties  
VAT = Value Added Tax  
 $\alpha_0$  is the intercept,  
 $\alpha_1$  and  $\alpha_6$  are the parameters and  
 $\mu_i$ , the error term

#### Apriori Expectations

Increased revenues would theoretically be expected to increase the quantum of expenditure in normal circumstance in light of increasing government

activities. This would in turn, influence the economic activity and increase revenue sources. In summary it is expected that;

$$\alpha_1 - \alpha_6 > 0$$

## PRESENTATION OF RESULTS

It is crucial to remark that the study variables employed were stationary at first difference and also provided significant results when Auto Regressive Distributive Lag test was executed. However, the Error Correction model (ECM) coefficient was found insignificant at 0.05 level. This suggests an inappropriate fit for long run relationship estimation. The model was therefore coerced into a more fitting

linear relationship by employing natural logarithm variants of the study variables. This resulted in significant estimates for Stationarity, Auto Regressive Distributive Lag and Error Correction estimation tests as duly reported hereunder. Accordingly, the results of the tests executed are therefore duly presented in accordance with the underlying study period for clarity purposes.

### Presentation of Results

#### Presentation of the Stationarity Test Results:

The stationarity test results for are presented in Table-2 below.

**Table-2: Presentation of Stationary Test Result**

	ADF CRITICAL VALUE	Mackinnon's critical values at			Order of Integration	Probability
		1%	5%	10%		
<b>D(TGE)</b>	-3.987862	-3.788030	-3.012363	-2.646119	I(1)	0.0092
<b>D(PPT)</b>	-6.606346	-3.788030	-3.012363	-2.646119	I(1)	0.0000
<b>D(PIT)</b>	-5.164320	-3.737853	-2.991878	-2.635542	I(1)	0.0005
<b>D(CIT)</b>	-6.157515	-3.886751	-3.052169	-2.666593	I(1)	0.0005
<b>D(CGT)</b>	-4.032890	-3.788030	-3.012363	-2.646119	I(1)	0.0021
<b>D(CED)</b>	-5.236369	-3.788030	-3.012363	-2.646119	I(1)	0.0004
<b>D(VAT)</b>	-3.845733	-3.788030	-3.012363	-2.646119	I(1)	0.0098

Source: Extracts from E-views 10.0 output

Table-1 above shows the difficulty of employed variables achieving stationarity at level. This has led to evaluations of stationarity at first difference. The employed variables were found to be significantly stationary at the first difference. This stationarity pervades the 10%, 5% and 1% significance level. After having showed stationarity, the study proceeds to the Bond co-integration, otherwise known as the Auto Regressive Distributive Lag (ARDL).

### Lag Length Selection

Due to the fact that revenues of previous period may be expended in future periods, the study therefore decides to know the most suitable lag for the time series. In light of this, the study proceeds to evaluate the lag length selection criteria.

**Table-3: Lag length Selection Criteria output**

VAR Lag Order Selection Criteria						
Endogenous variables: D(TGE)						
Exogenous variables: C D(PPT) D(PIT) D(CIT) D(CGT) D(CED) D(VAT)						
Date: 08/04/18 Time: 10:26						
Sample: 1994 2016						
Included observations: 22						
Lag	LogL	LR	FPE	AIC	SC	HQ
0	-149.2561	NA	88441.98	14.20510	14.55225	14.28688
1	-148.5059	0.954767*	91564.50*	14.22781*	14.62455*	14.32127*
* indicates lag order selected by the criterion						
LR: sequential modified LR test statistic (each test at 5% level)						
FPE: Final prediction error						
AIC: Akaike information criterion						
SC: Schwarz information criterion						
HQ: Hannan-Quinn information criterion						

Source: Extracts from E-views 10.0 output

Looking at the SC values in Table-3 above, it can be observed that a maximum lag of 1 is suggested for TGE model. (The AIC values suggest that 1 lags of D(TGE) and D(PPT) D(PIT) D(CIT) D(CGT) D(CED)

D(VAT) may be appropriate). In light of the above table, the study will thus proceed to use the first lag (1) of all employed variables



# Auto Regressive Distributive Lag (ARDL) short run

Based on shorter series interval, the study undertakes the Auto Regressive Distributive Lag (ARDL) test as presented below as follows:

**Table-4: Presentation of Auto Regressive Distributive Lag (ARDL)**

Table 4: Presentation of Auto Regressive Distributive Lag (ARDL)				
Dependent Variable: D(TGE)				
Method: ARDL				
Maximum dependent lags: 1 (Automatic selection)				
Model selection method: Akaike info criterion (AIC)				
Dynamic regressors (1 lag, automatic): D(PPT) D(PIT) D(CIT) D(CGT) D(CED) D(VAT)				
Fixed regressors: C				
Number of models evaluated: 64				
Selected Model: ARDL(1, 1, 0, 1, 1, 1, 1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
D(TGE(-1))	0.742144	0.571400	1.298818	0.2263
D(PPT)	2.50E-05	1.00E-05	2.489520	0.0242
D(PPT(-1))	9.366217	3.701998	2.530044	0.0231
D(PIT)	0.001383	0.001245	1.110388	0.2956
D(CIT)	0.027301	0.086610	3.152425	0.0082
D(CIT(-1))	9.07E-05	4.36E-05	2.082818	0.0450
D(CGT)	-0.000210	0.000375	-0.561310	0.5883
D(CGT(-1))	0.000944	0.000438	2.155575	0.0495
D(CED)	-0.000481	0.001826	-0.263359	0.7982
D(CED(-1))	0.002649	0.001939	1.366287	0.2050
D(VAT)	11.89272	2.206810	5.389100	0.0001
D(VAT(-1))	-10.68774	9.057826	-1.179945	0.2683
C	-267.8040	149.9480	-1.785979	0.1078
R-squared	0.894058	Mean dependent var		1857.474
Adjusted R-squared	0.886136	S.D. dependent var		1502.637
F-statistic	125.4728	Durbin-Watson stat		1.975947
Prob(F-statistic)	0.000000			
*Note: p-values and any subsequent tests do not account for model selection.				

Source: Extracts from E-views 10.0 output

The above ARDL output shows that; employed predictor variables in the form of taxes and duties jointly account for up to 89.41% of variations in the Total Expenditure pattern of the government. Following this, the F-statistics of 125.4728 at a probability level of 0.0000 is seen to show a very viable model. The Durbin Watson is seen to be within the significant range (although, the presence of lagged values has limited its validity). Based on the above, significant short run relationship is seen to exist. This relationship is most significant in light of present and immediate past values

of Petroleum Profit Tax (PPT). Company income tax (CIT) and its immediate past value also shows positive significant short run relationship with government expenditure patterns. Finally, past values of Capital gains tax (CGT) and Value added tax showed significant influence on government expenditure.

# Bonds Co-integration Test

To evaluate the long run relationship amongst employed ARDL variables, the bond test is carried out as follows.

**Table-5: Presentation of ARDL Bond Test for Long run relationship identification**

<b>ARDL Bounds Test</b>				
<b>Null Hypothesis: No long-run relationships exist</b>				
<b>Test Statistic</b>	<b>Value</b>	<b>k</b>		
<b>F-statistic</b>	<b>4.947086</b>	<b>6</b>		
<b>Critical Value Bounds</b>				
<b>Significance</b>	<b>I0 Bound</b>	<b>I1 Bound</b>		
10%	2.12	3.23		
5%	2.45	3.61		
2.5%	2.75	3.99		
1%	3.15	4.43		
<b>Test Equation:</b>				
<b>Dependent Variable: D(TGE)</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PPT)	0.009476	0.004381	2.162976	0.0471
D(CIT)	0.000141	6.55E-05	2.155617	0.0495
D(CGT)	-5.62E-05	0.000339	-0.166036	0.8718

D(CED)	3.54E-05	0.001881	0.018835	0.9854
D(VAT)	9.924574	3.499208	2.836234	0.0195
C	-324.5935	147.5007	-2.200623	0.0453
D(PPT(-1))	-5.49E-05	2.54E-05	-2.163314	0.0487
D(PIT(-1))	-0.000503	0.000533	-0.943542	0.3700
D(CIT(-1))	0.000247	0.000103	2.403060	0.0397
D(CGT(-1))	0.000715	0.000285	2.506027	0.0335
D(CED(-1))	0.001702	0.001367	1.244762	0.2447
D(VAT(-1))	8.697751	4.697865	1.851427	0.0971
D(TGE(-1))	-0.834230	0.331708	-2.514952	0.0330
R-squared	0.827178	Mean dependent var	153.7844	
Adjusted R-squared	0.596749	S.D. dependent var	283.4086	
F-statistic	3.589729	Durbin-Watson stat	1.747291	
Prob(F-statistic)	0.031521			

Source: Extracts from E-views 10.0 output

The F-statistics value of 4.947086 is seen to be greater than all the critical value bounds. This goes to show that there exists significant long run relationship between employed variables. In light of the above table, the bond test shows a lower predictive capability of employed variables. This is evident in the situations where the R-square dropped from 89.4058 to 0.827178 which showed relatively lower predictive capability of the model in light of bond test evaluations. The Adjusted R-square of 0.596749 shows further the inflated nature of the model as all employed predictor variables should account for only 59.67 percent of variations in expenditure pattern should the number of predictors be taken into account. The f-statistics probability level of 0.031521 still supports the viability and suitability of the model. Based on coefficient

probability level, it can be seen that; current values of Petroleum profit tax (PPT), company income tax (CIT) and value added tax (VAT) significantly influence the expenditure pattern of the government. While immediate past values accruing from petroleum profit tax (PPT-1), Company income tax (CIT-1), Capital Gains Tax (CGT-1) and Expenditure itself are significant influence of expenditure patterns (TGE) in Nigeria over the study period.

#### Autoregressive Lag Distributive Error Correction Estimate

To adjust for disequilibrium between the long and short run estimate, the study proceeds to further evaluate the co-integration and long run form in light of the error correction term (CointEq(-1))

Table-6: Presentation of ARDL Error Correction Estimate

ARDL Cointegrating And Long Run Form				
Dependent Variable: TGE				
Selected Model: ARDL (1, 1, 0, 1, 1, 1, 1)				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PPT)	2.501E-05	1.00E-05	2.489520	0.0242
D(PIT)	0.001383	0.001245	1.110388	0.2956
D(CIT)	0.0273012	0.086610	3.152425	0.0082
D(CGT)	-0.000210	0.000375	-0.561310	0.5883
D(CED)	-0.000481	0.001826	-0.263359	0.7982
D(VAT)	11.892721	2.206810	5.389100	0.0001
CointEq(-1)	-0.257856	0.071400	-3.611430	0.0025
Cointeq = TGE - (-0.0001*PPT + 0.0054*PIT + 0.0005*CIT + 0.0028*CGT + 0.0084*CED -12.3304*VAT -1038.5803 )				
Long Run Coefficients				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(PPT)	0.009476	0.004381	2.162976	0.0471
D(PIT)	0.005363	0.016107	0.332950	0.7468
D(CIT)	0.000141	6.55E-05	2.155617	0.0495
D(CGT)	0.002845	0.006204	0.458536	0.6574
D(CED)	0.008409	0.020208	0.416096	0.6871
D(VAT)	9.924574	3.499208	2.836234	0.0195
C	-10.3858	21.61274	-0.480541	0.6423

Source: Extracts from E-views 10.0 output

In light of existence of long run relationship as seen by the Bond test above, it can be further reckoned that the disequilibrium between the long and short run

ARDL model can be adjusted for back by approximately -0.257856. This shows that there would be a 25.79 percent adjustment back to equilibrium in the

model. In light of the long run coefficients, it can be seen that Petroleum profit tax (PPT), company income tax (CIT) and value added tax (VAT) positively and significantly influence the expenditure pattern of the government.

### Presentation of the results of Granger Causality Test for Deregulated Exchange Rate Regime

The results of the Granger Causality test for the deregulated/flexible exchange rate regime are presented in Table-7 below:

**Table-7: Presentation of ARDL Bond Test for Long run relationship identification**

Pairwise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
D(PPT) does not Granger Cause D(TGE)	21	4.18421	0.0485
D(TGE) does not Granger Cause D(PPT)		2.93656	0.0820
D(PIT) does not Granger Cause D(TGE)	21	4.22385	0.0337
D(TGE) does not Granger Cause D(PIT)		14.8821	0.0002
D(CIT) does not Granger Cause D(TGE)	21	4.83692	0.0228
D(TGE) does not Granger Cause D(CIT)		3.11635	0.0719
D(CGT) does not Granger Cause D(TGE)	21	0.64453	0.5380
D(TGE) does not Granger Cause D(CGT)		2.05968	0.1600
D(CED) does not Granger Cause D(TGE)	21	0.13979	0.8706
D(TGE) does not Granger Cause D(CED)		1.87218	0.1860
D(VAT) does not Granger Cause D(TGE)	21	4.40463	0.0299
D(TGE) does not Granger Cause D(VAT)		5.58106	0.0145

**Source:** Extracts from E-views 10.0 output

The pairwise granger Causality tests above shows significant bidirectional causal relationship between Personal income Tax and Government expenditure pattern (TGE) and between Valued Added Tax (VAT) and Total Government Expenditure (TGE). While unidirectional causal relationship is seen to emanate from Petroleum Profit Tax to Total Government Expenditure (TGE) and from Company Income Tax (CIT) to Total Government Expenditure (TGE).

The above goes to show that Government Expenditure is largely dependent on Petroleum Profit tax and company income tax with negligible returns to these revenue sources. The only revenue/duties sources being improved by government revenue pattern is the Personal income tax and the value added taxes.

Based on the findings, it can be seen that government expenditure is largely reactive to tax revenue and duty levels. The most influential revenue/duties sources to expenditure includes Petroleum Profit taxes (PPT) accruing from the nation's natural endowment, the company income taxes which are based on firm's profitability and the value added taxes. Although, the study noticed spilled effects emanating from previous tax accruals which could be linked to slow budget passage and implementation.

## DISCUSSION OF FINDINGS

The study discovers that on one hand, Tax revenues and duties showed concurrent behavioral trend. This is most evident in the case of Personal Income Tax and Government Expenditure and Valued Added Tax and Government Expenditure. This shows that a bulk of government expenditure is funded by Personal Income Tax and Valued Added Taxes. Although, personal income tax is relatively insignificant

in the long run. It was seen that the trend of government expenditure is largely independent of Capital Gains Tax and Custom and Excise duties. This could be linked to insufficient funds accruing to the identified tax revenue and duties sources. While Friedman's Tax leading hypothesis is imminently represented as Petroleum Profit Tax and Company Income Tax are seen to be leading and determining the expenditure pattern of the public sector. Although, the above shows the dependence of government expenditure largely on the natural resource of the nation (crude oil) and the corporate firms.

Attributing the above to relevant schools of thought, the study see the different school of thoughts in play here;

- The harmonious movement of revenue and expenditure (Fiscal synchronization hypothesis) manifests in light of Personal income Tax (PIT) and the Value added Tax (VAT) based on their bidirectional causal relationship with Expenditure patterns.
- Although independence of revenue and expenditure (fiscal neutrality/independence) is most noticeable in custom and excise duty and partially from the Capital Gains Tax in Nigeria.
- While Friedman's lead hypothesis in which tax revenue leading expenditure is witnessed to be reflected in the Petroleum Profit Tax and the Company Income Tax (CIT).

## DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

This study has examine the influence and inter-relationship between Public Taxes, Duties and Expenditure over the period of 1994 to 2016. The results shows that all employed variables were

stationary at first difference. Due to the length/time interval of the study, the study employed the Autoregressive Distributive Lag model. The lag length selection criteria showed the sufficiency of the first lag for the employed model, the ARDL test showed significant long run relationship and it was discovered that; Petroleum profit tax (PPT), company income tax (CIT) and value added tax (VAT) positively and significantly influence the expenditure pattern of the government while causality was seen to be bidirectional between Personal income Tax and Government expenditure pattern (TGE) and between Valued Added Tax (VAT) and Total Government Expenditure (TGE). Whereas, unidirectional causal relationship is seen to emanate from Petroleum Profit Tax to Total Government Expenditure (TGE) and from Company Income Tax (CIT) to Total Government Expenditure (TGE). The study therefore sees the concurrent existence of the an harmony of tax revenue and government expenditure (Fiscal synchronization hypothesis), fiscal neutrality/independence and Friedman's lead hypothesis of Tax and Spend. The significant effect of lagged values shows the possible prevalence of delayed budget approval and implementation.

It is thus concluded in light of the above that, there exists various degrees of interrelationship between government tax and revenue and government expenditure (duties excluded). Although, it is also observed that, expenditure is heavily reliant on the revenue sources than otherwise. The custom and excise duties can also be said to be an insignificant revenue sources which should be fully scrutinized.

It is recommended based on the above findings that; (i) the public sector should ensure a fluid budgetary process to ensure easier transition and benefit from revenues via government expenditures, (ii) Government should give back to revenue sources via increased capital expenditure which could also boost and sustain revenue sources and (iii) the custom and excise duties shows a complacent role in the expenditure pattern which could be linked to improper remittances and poor collection plans. Therefore, duties collection should be reformed to ensure proper remittances and adequate collection plans.

## REFERENCES

- Christie, T. A., & Rioja, F. K. (2012). Debt and Taxes: Financing Productive Government Expenditures. *Job Market Paper*, 1-35.
- Rahman, S. A., & Wadud, M. A. (2014). Tax and Spend, Spend and Tax, Fiscal Synchronization or Fiscal Neutrality: Evidence from Bangladesh. *The International Journal of Applied Economics and Finance*, 8(3), 98.
- De Castro, F., & de Cos, P. H. (2002). On the sustainability of the Spanish public budget performance. *Hacienda Pública Española/Revista de Economía Pública*, 160(1), 2002.
- Fakile, A. S., Adegbe, F. F., & Samuel, O. (2014). Mobilizing domestic revenue for sustainable development in Africa. *European Journal of Accounting, Auditing, and Finance Research*, 2(2), 91-108.
- Taha, R. & Loganathan, N. (2008). Causality between tax revenue and government spending in Malaysia. *The International Journal of Business and Finance Research*. 2(2): 63-73.
- Nwosu, D. C., & Okafor, H. O. (2014). Government revenue and expenditure in Nigeria: A disaggregated analysis. *Asian Economic and Financial Review*, 4(7), 877.
- Ullah, N. (2016). The Relationship of Government Revenue and Government Expenditure: A case study of Malaysia. *Munich Personal RePEc Archive: International Center for Education in Islamic Finance*. Paper No. 69123.
- Abdulrasheed, B. (2017). Causality between government expenditure and government revenue in Nigeria. *Asian Journal of Economics and Empirical Research*, 4(2), 91-98.
- Obioma, E. C., & Ozughalu, U. M. (2010). An examination of the relationship between government revenue and government expenditure in Nigeria: Cointegration and Causality Approach. *Economic and Financial Review*, 48(2): 35-57.
- Nwaiwu, N. J., & Macgregor, T. C. (2018). Government collectible tax revenue and economic growth in Nigeria: A longitudinal assessment (1975-2015). *International Journal of Advanced Academic Research*, 4(2). 36-57.
- Adereti. S.A., Sanni. M. R., & Adesina, J.A. (2011). Value-added tax and economic growth of Nigeria. *European Journal of Humanities and Social Sciences*, 10(1), 456-471.
- Fasoranli. M. M. (2013). Tax productivity and economic growth. *Loren Journal of Business Economics*. 1(1), 1-10
- Odusola, A. F. (2003). Internally generated revenue at the local government: issues and challenges. In *Workshop on Revenue Generation at the State Government Level, October. Ibadan: University of Ibadan*.
- Adebisi, J. F., & Gbegi, D. O. (2013). Effect of tax avoidance and tax evasion on personal income tax administration in Nigeria. *American Journal of Humanities and Social Sciences*, 1(3), 125-134.
- Nwete, B. O. (2004). Human Rights and the International Natural Resources Industry: Multinational Corporations and the BTC Pipelinme Project: Any Hope for Human Rights and Sustainable Development?.
- Fasoranti, O. O. (2013). Rural Poverty Alleviation In Nigeria: Withal?.
- Mehrara, M., Pahlavani, M., & Elyasi, Y. (2011). Government revenue and government expenditure nexus in Asian countries: Panel cointegration and



- causality. *International Journal of Business and Social Science*, 2(7), 199-207.
18. Friedman, A. (1982). *Foundations of modern analysis*. Courier Corporation.
19. Narayan, P. K. (2005). The government revenue and government expenditure nexus: empirical evidence from nine Asian countries. *Journal of Asian Economics*, 15(6), 1203-1216.
20. Friedman, M. (1982). Monetary policy: Theory and practice. *Journal of Money, Credit and Banking*, 14(1), 98-118.
21. Moalusi, D. K. (2007). *Causal link between government spending and revenue: A case study of Botswana*. Fordham University, Department of Economics.
22. Buchanan, J. M., & Wagner, R. E. (1978). Dialogues concerning fiscal religion. *Journal of Monetary economics*, 4(3), 627-636.
23. Mashegoane, S., Moalusi, K. P., Ngoepe, M. A., & Peltzer, K. (2004). The prediction of condom use intention among South African university students. *Psychological Reports*, 95(2), 407-417.
24. Peacock, A. T., & Wiseman, J. (1961). The growth of government expenditures in the United Kingdom.
25. Peacock, A. T., & Wiseman, J. (1967). *The growth of public expenditure in the United Kingdom* (Vol. 1). Allen & Unwin.
26. Meltzer, A. H., & Richard, S. F. (1981). A rational theory of the size of government. *Journal of political Economy*, 89(5), 914-927.
27. Musgrave, R. (1966). Principles of budget determination. *Public finance: Selected readings*, 15-27.
28. Barro, R. J. (1979). On the determination of the public debt. *Journal of political Economy*, 87(5, Part 1), 940-971.
29. Baghestani, H., & McNown, R. (1994). Do revenues or expenditures respond to budgetary disequilibria?. *Southern Economic Journal*, 311-322.
30. Barro, R. J. (1974). Are government bonds net wealth?. *Journal of political economy*, 82(6), 1095-1117.
31. Peacock, A. T., & Wiseman, J. (1979). Approaches to the analysis of government expenditure growth. *Public Finance Quarterly*, 7(1), 3-23.
32. Adejare, A. T., & Akande, S. S. (2017). The Impact of personal income tax on government expenditure in Oyo State. *Account and Financial Management Journal*, 2(4), 635-643.
33. Aslam, A. L. M. (2016). Tax revenue and government expenditure in Sri Lanka: An econometric AEG testing approach. *International Letters of Social and Humanistic Sciences*, 66, 31-37.
34. Lojanica, N. (2015). Government Expenditure and Government Revenue—The Causality on the Example of the Republic of Serbia. In *Management International Conference, Portoroz, Slovenia*, 28-30.
35. Edirisinghe, N., & Sivarajasingham, S. (2015). Testing the inter-temporal relationship between government spending and revenue: Evidence from Sri Lanka. *Global Journal of Human-Social Science Research*.
36. Mainoma, M. A. & Aruwa, S. A. S. (2015). *Public expenditure and revenue: The Nigerian case in managing public finance for development*. Kaduna, Nigeria: Fecility Publishers.
37. Mehrara, M., & Rezaei, A. A. (2014). The relationship between government revenue and government expenditure in Iran. *International Journal of Academic Research in Business and Social Sciences*, 4(3), 171.
38. Rahman, S. A., & Wadud, M. A. (2014). Tax and Spend, Spend and Tax, Fiscal Synchronization or Fiscal Neutrality: Evidence from Bangladesh. *The International Journal of Applied Economics and Finance*, 8(3), 98.
39. Luković, S., & Grbić, M. (2014). The causal relationship between government revenue and expenditure in Serbia. *Economic Themes*, 52(2), 127-138.
40. Takumah, W. (2014). The dynamic causal relationship between government revenue and government expenditure nexus in Ghana. *Munich Personal RePEc Archive Paper* No. 58579.
41. Lee, D., Kim, D., & Borchering, T. E. (2013). Tax structure and government spending: does the value-added tax increase the size of government?. *National Tax Journal*, 66(3), 541-570.
42. Norris, H. (2013). From bust to boom to bust again: Trends in Irish public revenue and expenditure from 1997 to 2012. *Critical Social Thinking*, 5(1), 192-209.
43. Abakay, A., Abakay, O., Tanrikulu, A. C., Sezgi, C., Sen, H., Kaya, H., ... & Senyigit, A. (2013). Effects of treatment regimens on survival in patients with malignant pleural mesothelioma. *Eur Rev Med Pharmacol Sci*, 17(1), 19-24.
44. Taghavi, M., & Ebrahim R. I. (2013). The review of influence of fiscal policies on consumption and employment, economical Research project, 15.
45. Ogujiuba, K., & Abraham, T. W. (2012). Testing the relationship between government revenue and expenditure: Evidence from Nigeria. *International Journal of Economics and Finance*, 4(11), 172.
46. Aregbeyen, O., & Ibrahim, T. M. (2012). Testing the revenue and expenditure nexus in Nigeria: An application of the bound test approach. *European Journal of Social Sciences*, 27(3), 374-380.
47. Yashobanta, Y. P., & Behera, S. R. (2012). Causal link between central government revenue and expenditure: Evidence for India. *Munich Personal RePEc Archive Paper* No. 43072.
48. Ali, R., & Shah, M. (2012). The causal relationship between government expenditure and revenue in

- Pakistan. *Interdisciplinary Journal of Contemporary Research in Business*, 3(12): 323-329.
49. Shukla, A., Mandal, A., Khan, A. H., Pradhan, A. S., Pendse, A., Bakshi, A., ... & Joshi, C. (2011). The contribution of the following experts, is gratefully acknowledged for their valuable time and cooperation for reviewing the manuscripts during 2010. *Journal of Medical Physics*, 36(1), 53.
  50. Obioma, E. C., & Ozughalu, U. M. (2014). An examination of the relationship between government revenue and government expenditure in Nigeria: Co-integration and causality approach. *Central Bank of Nigeria*, 48(2), 35.
  51. Aisha, Z., & Khatoon, S. (2009). Government expenditure and tax revenue, causality and cointegration: The experience of Pakistan (1972-2007). *The Pakistan Development Review*, 951-959.
  52. Maynard, T., & Guy, K. (2009). The causal relationship between government expenditure and tax revenue in Barbados. *Research Department, Central Bank of Barbados*.
  53. Eita, J. H., & Mbazima, D. (2008). The causal relationship between government revenue and expenditure in Namibia. *Journal of Economic and Financial Sciences*, 2(2), 175-186.
  54. McLure, C., & Martinez-Vazquez, J. (2000). The assignment of revenues and expenditures in intergovernmental fiscal relations. *core course on Intergovernmental Relations and Local Financial Management, World Bank Institute, Washington, DC: World Bank*.
  55. Maghyreh, A., & Sweidan, O. (2004). Government Expenditures and Revenues in Jordan, What Cause What? Multivariate Cointegration Analysis.
  56. Fasano, U., & Wang, Q. (2002). Testing the relationship between government spending and revenue: Evidence from GCC countries. *International Monetary Fund Working Paper*, No. E62 H50 N15.
  57. Li, X. (2001). Government revenue, government expenditure, and temporal causality: Evidence from China. *Applied Economics*, 33(4): 485- 497.
  58. Aziz, M. A., Habibullah, M. S., Azman-Saini, W. N. W., & Azali, M. (2000). Testing for causality between taxation and government spending: An application of Toda-Yamamoto approach. *Pertanika Journal of Social Science and Humanities*, 8(1), 45-50.
  59. Kollias, C., & Makrydakis, S. (2000). Tax and spend or spend and tax? Empirical evidence from Greece, Spain, Portugal and Ireland. *Applied Economics*, 32(5): 533-546.
  60. Wong, H. T., & Lim, K. P. (2005). The relationship between government revenue and expenditure in Malaysia. *International Journal of Management Studies (IJMS)*, 12(2), 53-72.
  61. Aziz, M. A., Habibullah, M. S., Azman-Saini, W. N. W., & Azali, M. (2000). Testing for causality between taxation and government spending: An application of Toda-Yamamoto approach. *Pertanika journal of Social Sciences. And Humanities*, 8(1), 45-50.
  62. Owoye, O., & Onafowora, O. A. (2011). The relationship between tax revenues and government expenditures in European Union and Non-European Union OECD countries. *Public Finance Review*, 39(3), 429-461.
  63. Loganathan, N., Kogid, M., & Suriyani, M. N. S. (2011). Tax revenue and government spending constraints: Empirical evidence from Malaysia. *China-USA Business Review*, 10(9), 779-784.
  64. Gharvey, E. E. (2010). Government expenditures and revenues causation: some Caribbean empirical evidence. *Applied Econometrics and International Development*, 10(2), 149-165.
  65. Narayan, P. K., & Narayan, S. (2006). Government revenue and government expenditure nexus: Evidence from developing countries. *Applied Economics*, 38(3), 285-291.
  66. Mithani, D. M., & Khoo, G. S. (1999). Causality between government expenditure and revenue in Malaysia: A seasonal cointegration test. *ASEAN economic Bulletin*, 68-79.
  67. Sriyana, J. (2009). A causality relationship between tax revenue and government expenditure in Indonesia. *Economic Journal of Emerging Market*, 1(2): 93-101.
  68. Al-Khulaifi, A. S. (2012). The relationship between government revenue and expenditure in Qatar: A cointegration and causality Investigation. *International Journal of Economics and Finance*. 4(9): 142-148.
  69. Al-Qudair, K. H. A. (2005). The relationship between government expenditure and revenues in the Kingdom of Saudi Arabia: Testing for Co-integration and Causality. *JKAU. Economic & Administration*. 19(1): 31-43.
  70. Gounder, N., Narayan, P. K. & Prasad, A. (2007). An empirical investigation of the relationship between government revenue and expenditure: The case of the Fiji Islands. *International Journal of Social Economics*. 34(3): 147-158.
  71. Hong, L. J., & Nelson, B. L. (2009, December). A brief introduction to optimization via simulation. In *Proceedings of the 2009 Winter Simulation Conference (WSC)* (pp. 75-85). IEEE.
  72. Chaudhuri, P., Soni, S., & Sengupta, S. (2009). Single-walled carbon nanotube-conjugated chemotherapy exhibits increased therapeutic index in melanoma. *Nanotechnology*, 21(2), 025102.
  73. Huang, H. C., & Lin, S. C. (2009). Non-linear finance-growth nexus: A threshold with instrumental variable approach 1. *Economics of Transition*, 17(3), 439-466.

74. Afonso, A., & Rault, C. (2009). Spend-and-tax: A Panel Data Investigation for the EU.
75. Chang, T., W. R. Liu, I., & Caudill, S. B. (2002). Tax -and - spend, spend - and - tax, or fiscal synchronization: New evidence for ten countries. *Applied Economics*, 34(12): 1553-1561
76. Wolde-Rufael, Y. (2008). The Revenue–Expenditure Nexus: The Experience of 13 African Countries. *African Development Review*, 20(2), 273-283.
77. Toda, H. Y., & Yamamoto, T. (1995). Statistical inference in vector autoregressions with possibly integrated processes. *Journal of econometrics*, 66(1-2), 225-250.
78. Nyamongo, M. E., Sichei, M. M., & Schoeman, N. J. (2007). Government revenue and expenditure nexus in South Africa. *South African Journal of Economic and Management Sciences*, 10(2), 256-269.
79. AbuAl-Foul, B., & Baghestani, H. (2004). The causal relation between government revenue and spending: Evidence from Egypt and Jordan. *Journal of Economics and Finance*, 28(2), 260-269.
80. Hussain, D., Haydon, M. J., Wang, Y., Wong, E., Sherson, S. M., Young, J., ... & Cobbett, C. S. (2004). P-type ATPase heavy metal transporters with roles in essential zinc homeostasis in Arabidopsis. *The plant cell*, 16(5), 1327-1339.
81. Bell, S. (1998). Can Taxes and Bonds Finance Government Spending? Levy Economics Institute. Cambridge University Visiting Scholar, Working Paper No. 244.
82. Owoye, O. (1995). The causal relationship between taxes and expenditures in the G7countries: Cointegration and error-correction models. *Applied Economics Letters*, 2(1): 19-22.
83. Baffes, J., & Shah, A. (1994). Causality and comovement between taxes and expenditures: historical evidence from Argentina, Brazil, and Mexico. *Journal of Development Economics*, 44(2), 311-331.
84. Ewing, B., & Payne, J. (1998). Government revenue-expenditure nexus: Evidence from Latin America. *Journal of Economic Development*, 23(2), 57-69.
85. Park, J. H., Vescovo, E., Kim, H. J., Kwon, C., Ramesh, R., & Venkatesan, T. (1998). Direct evidence for a half-metallic ferromagnet. *Nature*, 392(6678), 794.
86. Craigwell, R. C., Leon, H., & Mascoll, C. (1994). Government revenue and expenditure causality in the presence of seasonality in Barbados. *Social and Economic Studies*, 43(4): 197-218.