

The Impact of Tax Revenue Shocks on Economic Growth in Nigeria

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Abstract: The study investigates the impact of tax revenue shocks on sustainable economic growth in Nigeria during the period 1980-2017 making use of annual time series data. The conventional and structural breakpoint unit root tests indicated that the study variables are fractionally integrated. The study employs the ARDL bounds testing approach to examine the long and short run relationship between the variables of interest. The bounds test results confirmed the existence of long-run relationships among the variables of interest. The empirical results revealed that PPT had a negative impact on growth that was not significant while PIT displayed a significant negative influence on growth in the short and long run period. CIT and CED indicated a significant positive effect on growth in both the short and long run. GCE had a significant negative effect while GRE showed a significant positive influence on economic growth both in the short and long run period. GDD, PED and FCS all exerted a significant negative effect on growth both in the short and long run period. The structural break dummy variable showed a positive impact on growth that was significant only in the short run. The study therefore recommends improved efficiency in tax collection and administration, diversification of revenue base, fiscal policy adjustment that reduces unproductive expenditure and reduction in government deficit financing.

Keywords: Tax Revenue, Economic Growth, Nigeria, Bounds Test, Structural Break

1. Introduction

Adam Smith (1776) stated that little use is required to carry a state to the highest degree of opulence- but peace, easy taxes and a tolerable administration of justice. It is striking that Smith single out taxation alongside peace and justice as the key to a successful society. This insight is today more important to the present-day Nigeria than ever. Nigeria's economy continue to face turbulent times, with just exiting from one of the worst recession in modern history in 2017, fragile Gross Domestic Product (GDP) growth rate, increasing government recurrent expenditure and debt burden, there is a pressing need to sustainably strengthen the economy, build infrastructure, reduce extreme poverty and most of all create jobs

(Nimenibo *et al*, 2018). Virtually all countries in the world strive to increase their revenue base so as to improve their economy as represented by the growth in their GDP. Taxation provides countries with stable and predictable fiscal environment, thus enabling them to accumulate funds needed to invest in development, poverty reduction and deliver public services. It offers an antidote to aid dependence in developing countries and provide fiscal reliance and sustainability that is needed to promote growth (Lagarde, 2015).

Taxation in developing countries is a strategic tool that makes it possible to finance the provision of public goods such as infrastructure, education, health and justice, which are essential for growth. But beyond that, taxation affects individual savings, work and education decisions, production, job creation, investment and business innovation, as well as the choice of savings instruments and assets by investors (OECD, 2009). All the decisions are affected not only by the level of taxes, but also by the way in which different fiscal instruments are designed and combined to generate government revenue (Gbato, 2017). Taxes constitute an important component of government revenue and the tax-to-GDP ratio is a key barometer that indicates the ability of the government to invest in various development initiatives (Nangih *et al*, 2018). According to the International Monetary Fund (IMF, 2017), a minimum ratio is associated with a significant acceleration of growth and development. The Fund believes this threshold lies around the 15% mark. Despite the importance of such factors, Nigeria registers such low tax collections that are barely able to sufficiently finance the carrying out of governance and meet the infrastructural development needs that is essential to delivering an enabling environment for business and the population (Nangih *et al*, 2018). Poor contribution of tax revenue to federally collected revenue in Nigeria and the ratio of tax revenue to GDP are alarming (Ofurun *et al.*, (2018). Whereas other African countries have their tax revenue constituting significant portion of their total revenue and GDP, Nigeria being the giant of Africa consistently maintained one of the lowest tax-to-GDP ratio in the world when compared with other countries. The tax-to-GDP ratios in eight African countries namely Tunisia, Morocco, South Africa, Senegal, Mauritius, Cote d'Ivoire, Rwanda and Ghana ranges from 16.1% to 31.3%, in 2014 (Ofurum *et al.*, 2018). However, in Nigeria, tax revenue as a percentage of GDP was 5.2% in 2014 and has continued to hover around an abysmal 6% since 2016, which is far below the estimated tipping point of 15 percent of GDP (Federal Inland Revenue Service, 2018).

While decrying the low tax-to-GDP ratio in Nigeria, Maiye & Ogochukwu (2018) identified narrow tax base, unorganized informal

sector, poor tax administrative machinery as well as lop-sidedness of the tax system as factors contributing to the low tax to GDP ratio in Nigeria. For a nation of nearly 200 million people, not many Nigerians pay taxes. There are many high net worth individuals, self-employed, professionals and companies that are able to evade full tax payment due to the historical inability of the tax authorities to assess their true income (Osinbajo, 2017). Undoubtedly, a small tax base places huge burden on honest and compliant tax payers. Furthermore, the revenue potentials of the informal sector of the economy have not been properly identified and harnessed. Income generated by the operators in the sector in many cases, is not officially captured into the tax net of the state (James and Moses, 2012). For many in formal employment, taxes are typically deducted from monthly salaries making tax evasion more tricky (Kazeem, 2017). But for many local business owners or artisans, with government unable to track their incomes, tax evasion is possible and likely rampant. The inclusion of the informal sector, through a broader tax system, will help to stimulate economic growth and development, create employment and stabilise the economy (Charles *et al*, 2018).

In Africa, Nigeria like Algeria, Angola, Equatorial Guinea and Libya rely almost entirely on petroleum profit tax as a major type of direct tax unlike Kenya, South Africa and Mauritania which show a relatively balanced mix of direct and indirect taxes (Gbato, 2017). The volatility in oil price and production often results in revenue volatility, expenditure volatility and unsustainable economic growth (Raifu & Raheem, 2017). The growth and development of any nation is predicated upon the availability of funds as well as other human and natural resources. Taxation remains an important fiscal instrument of government for generating revenue. Any shock to tax revenue is believed to affect government and thereby affect the national output. The low tax contribution to GDP in Nigeria over the years is affecting government's objectives to expand growth-enhancing expenditure priorities and improve economic growth. The crucial question is: does tax revenue still predict growth in periods of revenue shocks? On this strength, this study therefore, disaggregated the various components of direct tax and indirect tax and examined their individual impacts on the real Gross Domestic Product of Nigeria from 1980 to 2017 using the Auto-Regressive Distributed Lag (ARDL) approach to co-integration. Following this introduction, section two reviews relevant conceptual and theoretical literature while section three discusses the research methodology used in the study. The empirical results and discussions are presented in section four while section five concludes the study and offers some recommendations based on the findings.

2. Theoretical and Conceptual Framework

2.1. Theoretical Framework

The theoretical foundation of this study is anchored on the Laffer's curve theory of taxation, Solow-Swan and endogenous models of growth discussed below.

2.1.1. The Laffer's Curve Theory of Taxation

The economist Arthur Laffer developed the Laffer curve model of optimal taxation. The model assumes that government will attempt to generate as much revenue as possible without any regard to the efficiency losses caused by taxation. Only constitutional constraints and other legislation can limit government desires for increased revenue. The Laffer curve considers the inverse relationship between tax rates and tax bases and the impact of this relationship on tax revenues. The analysis reveals that a higher tax rate is not always the maximizing rate; a lower tax rate may raise more tax revenue than a higher tax rate (Asuquo & Effiong, 2011). The curve considers the amount of tax revenue raised at the extreme tax rates of zero percent and 100 percent. This theory is of the opinion that a 100% tax rate raises no revenue in the same way that 0% tax rate raise no revenue. This is because, at 100% tax rate, there is no longer incentive for a rational tax payer to earn any income because no one would be willing to work for an after-tax wage of zero (Fave & Dabari, 2017). Thus, the revenue raised will be 100% of nothing. It therefore, follows that there must exist at least one rate in between where tax revenue would be at maximum. This theory is of the opinion that increasing tax rate beyond a certain point will become counter-productive for raising further tax revenue because of diminishing returns (Ekwe & Azubuike, 2018).

The first presentation of Laffer curve was performed in 1979, when its author was speaking with senior staff members of President Gerald Ford's administration about the malaise that had engulfed the country. At the time, most economists were espousing a Keynesian approach to solving the problem, which advocated more government spending to stimulate demand for products. Laffer countered that the problem is not too little demand. Rather, it was the burden of heavy taxes and regulations that created impediments to production, which impacts government revenue. Laffer argues that when workers see increasing portion of their wages taken due to increased efforts on their part, they will lose the incentive to work harder. For every type of tax, there is a threshold rate above which the incentive to produce more diminishes, thereby reducing the amount of revenue the government receives (Karier, 1997).

2.1.2. Theories of Economic Growth

Economic growth is easily quantified as an increase in aggregate output. In theorizing economic growth, David Ricardo (1819) and later Robert Solow (1956) and many others conceptualize an economy as a machine that produces economic output as a function of inputs such as labour, land and equipment. Output can increase either when we add more inputs or use technology or innovation in order to enhance the efficiency with which we transform inputs into outputs. Subsequently, growth occurs when output increases.

Following the seminal contribution of Solow (1956), the determinants of economic growth have attracted increasing attention in both theoretical and applied research. While Solow suggests that much of the growth in an economy is explained by changes in the amount of labour, the endogenous growth theorists emphasize the importance of knowledge capital (Romer, 1986), human capital (Lucas, 1988), learning by doing (Stokey, 1988), research and development and horizontal/vertical innovation (Aghion and Howitt, 1992) in the long run growth of an economy. In addition, other schools have highlighted the significant role of non-economic factors such as institutional structures, legal and political systems and socio-cultural factors in economic growth (Udeaja and Onyebuchi, 2015). The neo-classical growth model of Solow (1956) and Swan (1956) suggests that steady state growth is not affected by tax policy (that is, tax policy has no impact on long run economic growth). Yet, the endogenous growth theory, pioneered by Romer (1990) has produced growth models in which government spending and tax policies can have long-term or permanent growth effects.

Taking Solow-Swan's approach to economic growth rate as the starting point, economic growth rate depends on available physical and human capital and on the changes in their productivity. Conventionally, the familiar Cobb-Douglas production function can be written as:

$$Y_t = A_t K_t^\alpha L^{1-\alpha} \quad \text{Eqn 1}$$

Where:

Y = Total output in an economy

A = Total Factor Productivity (Level of technology)

K = Capital stock L = Population of the labour force

α and β = parameter representing the output elasticity of each input.

Equation 1 is assumed to satisfy all the requirements of the standard Cobb-Douglas production function (Lucas, 1988). Expressing Equation 1 in double log form, we have:

$$\text{Log } Y = \text{Log } (AK^\alpha L^\alpha) \quad \text{Eqn. 2}$$

Linearising Equation 2, we have:

$$\text{Log } Y = \text{Log } A + \alpha \text{Log } K + \beta \text{Log } L \quad \text{Eqn. 3}$$

Taking the first differentiation of Equation 3, it yields

$$y = \alpha k + \beta l + \mu \quad \text{Eqn. 4}$$

where:

y = Growth rate of Real GDP, k = Growth rate of capital stock,

l = Growth rate of effective labour force, μ = Growth of overall productivity while

α measures the marginal productivity of capital and

β is the elasticity of labour/output ratio.

2.2. Conceptual Framework

Kajola (2006) defines tax as a compulsory payment made by individuals and organizations to the government in accordance with pre-determined criteria for which no direct or specific benefit is received by the tax payer. This in effect implies that tax is a generalized exaction, which may be levied on one or more criteria upon individuals, groups or the legal entities. The motive of tax is to finance the activities of public sector so as to achieve economic and social goals in the country. Nzotta (2007) noted that taxes have allocation, distributional and stabilisation functions. The allocation function of taxes entails the determination of the pattern of production, the goods that should be produced, who produces them, the relationship between the private and the public sectors and the point of social balance between the two sectors. The distribution function of taxes relates to the manner in which effective demand for economic goods is divided among individuals in the society while stabilisation function of taxes seeks to attain a high level of employment, a reasonable level of price stability, an appropriate rate of economic growth with allowances for effects on trade and the balance of payments.

Economic theory suggests that taxation can have both positive and negative effects on economic growth. The negative effect is due to the distortions in choices and effect of discouragement factors inherent in taxes (Easterly & Rebello, 1990). The positive effects of taxation on economic growth were highlighted by the endogenous growth models. These models showed that when tax revenues are used to finance public investment in social and physical infrastructure such as education and health, electricity, telecommunications, roads, defence, etc., they can be favourable to growth

(Lucas, 1988, Barro, 1990). In other words, there exists a relationship between tax revenue and the level of economic growth and development. This is consistent with Musgrave's (1969) hypothesis that the level of economic development has a strong impact on a country's tax base and tax policy objectives vary with the stages of development (Nwaorgu & Onyilo, (2016). Also, the economic criteria by which tax structure is to be judged and the relative importance of each tax source vary over time (Musgrave, 1969).

From the theoretical framework, the determinants of economic growth include government tax revenues. The conceptual framework of this study disaggregated tax revenues into their various components of direct and indirect taxes. Following Solow-Swan model, external debt and domestic debt are considered as independent factors of production to replace capital stock while the growth rate of effective labour force was proxy with labour force growth. Total output in an economy was measured with the Real Gross Domestic Product. The study introduced Fiscal Stance as a dummy variable to measure the expected or desired aggregate demand effect of fiscal policy on the economy. The econometric analysis performed in this study builds on a multivariate set-up, allowing for key control variables such as public external debt, government domestic debt, labour force and fiscal stance to intermediate the nexus between tax revenue and economic growth. Such a rich environment can overcome variable omission bias, thus allowing for efficient estimates of the test statistics.

3. Research Methodology

3.1. Research Design

This study adopted the quantitative method and descriptive research design to provide empirical solution to the research problems using already existing data. Descriptive research designs help provide answers to the questions of who, what, when, where and how associated with a particular research problem. A descriptive study is used to obtain information concerning the current status of the phenomena and to describe "what exists" with respect to variables (William, 2006).

3.2. Data Sources and Descriptions

The data for this study which are purely secondary were extracted from various reports of the Federal Inland Revenue Service (FIRS), Central Bank of Nigeria (CBN) Statistical Bulletin, Debt Management Office (DMO), World Bank and the International Monetary Fund (IMF) World Development Indicators using the desk survey approach. This is because the study is country specific and the estimation of the empirical models

requires the use of time series data. All variables were taken on annual basis as obtained from their various sources in nominal terms.

3.3. Specification of the Empirical Model

The model designed to capture the impact of tax revenue shocks on economic growth in Nigeria expresses changes in Real Gross Domestic Product (RGDP), proxy for economic growth, as a function of the growth rate of Petroleum Profit Tax (PPT), Company Income Tax (CIT), Personal Income Tax (PIT), Customs and Excise Duties (CED), Government Capital Expenditure (GCE), Government Recurrent Expenditure (GRE), Public External Debt (PED), Government Domestic Debt (GDD), and Fiscal Stance (FCS). This study leans very closely on the newer endogenous growth theory prescription of Barro and Sala-i-Martin (1992) which allows for the assessment of the effects of budgetary variables on economic growth. The endogenous growth model here is linear and could be stated in a linear form as follows:

$$\Delta \text{RGDP}_t = \beta_0 + \beta_1 \text{PPT}_t + \beta_2 \text{CIT}_t + \beta_3 \text{PIT}_t + \beta_4 \text{CED}_t + \beta_5 \text{GCE}_t + \beta_6 \text{GRE}_t + \beta_7 \text{PED}_t + \beta_8 \text{GDD}_t + \beta_9 \text{FCS}_t + \mu_t \quad \text{Eqn . 5}$$

Where,

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ and β_9 = Regression coefficients to be estimated.

FCS = Fiscal Stance (Dummy variable, 1 for Budget Deficit and 0 for Budget Surplus).

t = time trend β_0 = Intercept μ = stochastic disturbance or error term.

3.3.1. A Priori Expectation from the Model

The theoretical expectations about the signs of the coefficients of the empirical model follow naturally from the analysis of production theory. From equation 5, the study expects the signs of the coefficients of the various tax revenues to assume either positive or negative signs. That is, $\beta_1, \beta_2, \beta_3$, and $\beta_4 = >$ or < 0 . β_5 and β_6 are the disaggregated coefficients of Government expenditure while β_7 and β_8 are the disaggregated parameter coefficients of public debts. The study expects the signs of the coefficients of β_5 to be either positive and β_6 to be negative. From production theory analysis, the coefficient of public debts is expected to be positively or negatively related with RGDP depending on management of debts. β_9 is the parameter coefficient for the dummy variable, Fiscal Stance. The theoretical expectation of the sign of the coefficient could either be a positive or negative sign. That is, $\beta_9 = >$ or < 0 . A positive coefficient signifies a positive impact of current fiscal policy on economic growth while a negative coefficient indicates otherwise.

3.4. Estimation Technique

The study uses the Auto-Regressive Distributed Lag (ARDL) co-integration test popularly known as bounds test procedure, jointly developed by Pesaran *et al* (2001), to empirically analyse the short and long run impact of tax revenue shocks on economic growth in Nigeria. The ARDL is utilized in this study mainly because it allows for variables integrated of order zero and order one, $I(0)$ and $I(1)$ respectively, to be utilized in the same model without the risk of generating spurious regressions (Pesaran *et al*, 2001). The ARDL bounds test is also robust for finite samples, even in the presence of phenomena of shocks and regime shifts. In addition, different optimal lags can be used for different variables as they enter the model, which is not applicable in the standard co-integration test. Lastly, this technique allows for the simultaneous estimation of the short and long run parameters in the model. To use this approach, the study first ensure that none of the variables in the model are $I(2)$, as such data will invalidate the methodology. Second, formulate an “unrestricted Error Correction Model (ECM) for all general and specific objectives. Following these, estimate the equation and ensure the errors of each model are serially independent and stable. Then perform a “Bounds test” to see if there is evidence of a long run relationship between the variables and if the outcome is positive, then the study estimated a long run levels model, as well as a separate unrestricted ECM.

4. Results and Discussion

4.1. Unit Root Test Results

Prior to investigating co-integration, researchers effect unit root test on the series under study to examine the stationarity properties of time series variables. The conventional method of Augmented Dickey-Fuller (ADF), Phillips-Perron (PP), Kwiatkowski, Phillips, Schmidt and Shin (KPSS) unit root test of stationarity are usually weak in the face of structural break. A break is an intermittent shock that has a permanent effect on time series. Failure to explicitly account for this break during the unit root testing procedure will lead to a bias that reduces the ability to reject a false unit root null hypothesis (Glynn *et al*. 2007). The conventional unit root test like ADF, PP, KPSS usually mistake the structural break for a unit root and report wrongly. Because of this, it is usually imperative for one to go for a unit root procedure that explicitly account for the possibility of structural break and the Zivot-Andrews (1992) unit root procedure is used to account for such breaks. The results of the ADF, PP and Zivot-Andrews unit root tests are presented in table 1.

Table 1
ADF, PP and Zivot-Andrews Unit Root Tests Results

Variables	ADF		PP Test		ZA			
	Level	1st Diff.	Level	1st Diff.	Remark	Break Date	t-Statistic	Remark
LogRGDP	0.8172 ⁿ	-3.3343 ^b	1.5994 ⁿ	-3.1916 ^b	I(1)	2014	-5.4805 ^a	I(1)
LogPPT	-1.1409 ⁿ	-4.7956 ^a	-0.7736 ⁿ	-5.8202 ^a	I(1)	2014	-5.3581 ^a	I(1)
LogCIT	-0.5852 ⁿ	-6.8171 ^a	-0.5778 ⁿ	-6.6691 ^a	I(1)	2015	-7.9622 ^a	I(1)
LogPIT	-0.9376 ⁿ	-6.4892 ^a	-0.8298 ⁿ	-6.4381 ^a	I(1)	2011	-7.0523 ^a	I(1)
LogCED	-0.6526 ⁿ	-6.0569 ^a	-0.6495 ⁿ	-6.0568 ^a	I(1)	2003	-6.2392 ^a	I(1)
LogGCE	-0.9588 ⁿ	-6.3494 ^a	-0.5908 ⁿ	-6.3394 ^a	I(1)	1999	-7.3027 ^a	I(1)
LogGRE	-1.6727 ⁿ	-7.7908 ^a	-1.2415 ⁿ	-7.6220 ^a	I(1)	2011	-9.5838 ^a	I(1)
LogGDD	-2.9009 ^c	-1.0773 ⁿ	-0.0271 ^b	-9.2562 ^a	I(0)	2015	-5.1611 ^a	I(1)
LogPED	-2.6598 ^c	-4.2422 ^a	-2.6884 ^c	-4.2422 ^a	I(1)	2005	-6.1592 ^a	I(0)
FCS	-5.1559 ^a	-6.1644 ^a	-5.1653 ^a	-19.108 ^a	I(0)	2012	-6.8801 ^a	I(0)

Notes: a, b and c denotes the rejection of the null hypothesis at 1%, 5% and 10% significance levels respectively while n denotes Not Significant.

Source: Author's Computation using Data from Central Bank of Nigeria and National Bureau of Statistics (1980-2017)

The ADF and PP unit root test results both showed that, LOGRGDP, LOGPPT, LOGCIT, LOGPIT, LOGCED, LOGGCE, LOGGRE and LOGPED were not stationary at levels. From the ADF test results, only FCS was stationary at levels while the remaining variables achieved stationarity only after first difference. The PP unit root test results showed that FCS and LOGGDD were stationary at levels meaning that they are integrated of order zero or I(0). Hence, we conclude that these variables are stationary at first difference which imply that they are integrated of order I(1). Based on the ADF and PP unit root test results, we can conclude that all our variables are integrated of order zero, I(0) or one I(1).

From the Zivot & Andrews (1992) structural break unit root test, it is evident that breaks in data occurred in 2014 for RGDP and PPT during the oil price shock which started in mid-2014. The CIT and GDD variables exhibit the same structural break year in 2015 and are stationary at first difference. Breaks in PIT and GRE occurred in 2011 when there was a general election in Nigeria and are stationary at first difference. Breaks in CED occurred in 2003 and 1999 for GCE variable and is stationary at first difference. Public external debt however, exhibited a structural break in 2005 and is stationary at first difference. This is a period during which Nigeria and the Paris Club announced a final agreement for debt relief worth \$18 billion and an overall reduction of Nigeria's debt stock by \$30 billion in October 2005. The objective of the structural break unit root test is to examine the effects of shocks in government revenue sources on Nigeria's

economic growth. To do this, the study carried out a multiple breakpoint test for the growth model using the Bai-Perron (2003) sequential breaks test. The results revealed the break dates of 2011, 1990 and 2003 respectively as the sequentially determined breaks of the model in order of their significance (of 1, 2, 3). As we usually use one break in the model and the Bai-Perron sequential breaks test results revealed that 2011 break dates has the most important effect on the variables included in our model, we therefore created a new dummy variable with the value of “zeros” from 1980 to 2010 and “ones” from 2011 to 2017. This dummy variable is used as structural break variable that is used as an independent variable in our model to capture the effect of structural break on economic growth in Nigeria within the study period.

ARDL Bounds Test to Co-integration Analysis

Given the unit root properties of the variables, we proceed to establish whether there exists a long run relationship between the independent variables and real Gross Domestic Product using the ARDL bounds testing procedure. The lag structure of an ARDL model is crucial for the results to be valid. The maximum dependent lags of 2, was automatically selected for our ARDL growth model on the basis of Akaike Information Criterion (AIC) from the lag length selection criteria. We therefore estimate an ARDL growth model (1, 0, 2, 2, 0, 1, 2, 1, 2, 2, 0). The results obtained from the ARDL bounds testing approach and the estimated F-test are displayed in table.

Test Statistic	Critical Value	Significance Level	I(0)	I(1)
F-Statistic	5.767984	1%	2.54	3.86
K	10	2.5%	2.28	3.50
		5%	2.06	3.24
		10%	1.83	2.94

Source: Author’s Calculation using E-views 9.5

From the ARDL bounds test of co-integration, the null hypothesis of no co-integration is tested against the alternative hypothesis of the presence of co-integration among the variables in the model. From the results in table 2, since the F-statistic (5.767984) is greater than all the upper bound values at 10%, 5% and 1% level respectively, the null hypothesis of no co-integration is rejected hence there is evidence of long run relationship among the variables in our growth model at 5% level of significance. This finding is consistent with our theoretical framework of Laffer’s and Barro’s endogenous growth theories which assert that productive government

spending and non-distortionary tax policies can have a long-term or permanent growth effects on countries. We therefore proceed to estimate the short and long run coefficients of our ARDL model.

Long Run Co-integration Results for the Growth Model

Since long run relationship was established from the ARDL bounds co-integration test, the study proceeded to examine the long run effect of the independent variables on economic growth by estimating the conditional ARDL long run model for economic growth and the results are presented in table 2.

Table 2
Long Run Co-integration Results of ARDL Model (1, 0, 2, 2, 0, 1, 2, 1, 2, 2, 0)

<i>Variables</i>	<i>Coefficients</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Probability</i>
LOGPPT	-0.002459	0.0222686	-0.108400	0.9155
LOGCIT	0.489881	0.061447	7.972473	0.0000
LOGPIT	-0.066276	0.018873	-3.511718	0.0043
LOGCED	0.155107	0.052446	2.957460	0.0120
LOGGCE	-0.273715	0.041065	-6.665420	0.0000
LOGGRE	0.225847	0.067509	3.342460	0.0059
LOGGDD	-0.439390	0.058594	-7.498841	0.0000
LOGPED	-0.060070	0.013652	-4.400258	0.0009
FCS	-0.137937	0.052743	-2.615244	0.0226
DUMSB	0.116330	0.063891	1.820768	0.0937

Source: Author's Calculation using Data from Central Bank of Nigeria and National Bureau of Statistics (1980-2017).

The long run coefficient of Petroleum Profit Tax (LOGPPT) has a negative but statistically insignificant effect on economic growth. This implies that PPT has not contributed significantly towards stimulating economic growth in Nigeria during the period under review. The negative sign of this variable is however not unexpected as a result of the over dependence of the country on unpredictable oil revenue for public spending. Volatility in oil price often results in revenue volatility, expenditure volatility, output volatility and unsustainable economic growth. Corruption, mismanagement, waste, oil price volatility and fixation on the sharing of oil revenue at the expense of production are unsustainable and unethical practices that have continue to stifle sustainable economic growth in Nigeria. The result is consistent with extant study of Odhiambo & Oluwatosin (2018) who found a negative and statistically insignificant effect of petroleum profit tax on economic growth in Nigeria.

The long run coefficients of Company Income Tax (LOGCIT), Customs and Excise Duties (LOGCED) both show signs of positive effect on economic growth and are both significant at one percent level. This implies that CIT and CED do have significant impact on the growth rate of Real GDP in Nigeria. Thus, an increase in government revenue generation through company income tax, customs and excise duties is associated with 0.489881 and 0.155107 increases in economic growth respectively. Tax revenue is a major source of financing government spending required to promote growth and provide needed infrastructures. This finding is in line with existing literature and findings of Venkataraman & Urmi (2018), Nonvida & Amegnaglo (2017) and Ofoegbu *et al.* (2016) who reported a significant positive long run impact of company income tax, customs and excise duties on economic growth in India, Benin and Nigeria.

The long run coefficient of Personal Income Tax (LOGPIT) portrays a negative relationship with economic growth that is significant at one percent level. The result reveals that a unit increase in personal income tax is expected to decrease economic growth by 6.63 percent *ceteris paribus*. Government will attempt to generate as much revenue as possible without any regard to the efficiency losses caused by taxation. Increasing tax rate beyond a certain threshold is counter-productive for raising further tax revenue and act as a disincentive to economic growth. This justifies the findings of Atems (2015), Stoilova (2017), Badri & Allahyari (2013) who have established that higher taxes have a negative impact on economic growth in 48 states of United States, 28 European countries and Iran.

The long run results further show that the coefficient of Government Capital Expenditure (LOGGCE) has an unexpected negative effect on economic growth that is significant at one percent level. This may suggest that contrary to a priori expectation, in the long run, government capital expenditure may have a net negative impact on economic growth in Nigeria. Thus, a unit increase in government capital expenditure is associated with about 27.37 percent decrease in the level of economic growth in Nigeria within the study period. Nigeria spends significant part of its revenue on servicing huge public debts, subsidizing domestic fuel consumption, fighting protracted insurgency and other violent crimes. Consequently, the country has very little left to fund critical infrastructure like education, health, transportation and communication which exerts positive effect on economic growth. This validate the findings of Iheanacho ((2016), Darma (2014) and Modebe *et al.* (2012) who found a significant negative impact of capital expenditure on economic growth in Nigeria in the long run.

The long run effect of Government Recurrent Expenditure (LOGGRE) on economic growth is positive and also significant at one percent level. From this result, a unit increase in government recurrent expenditure would lead to about 22.58 percent increase in economic growth. Hence, increase in government recurrent spending can bolster economic growth by putting money into people's pockets. The findings confirm the views of Keynes and Wagner on the impact of public expenditure on economic growth and also consistent with studies by Chikezie *et al.* (2017), Iheanacho (2016), Modebe *et al.* (2012), Josaphat & Oliver (2000) who found that increase recurrent expenditure relates positively with economic growth of Nigeria and Tanzania respectively.

Confirming a priori expectation, the long run coefficient of Government Domestic Debts (LOGGDD) demonstrates a negative effect on economic growth that is significant at one percent level. From the results, a unit increase in the level of domestic borrowings by government would lead to a decrease in economic growth by about 43.94 percent. The federal government continued borrowing from the domestic market for deficit financing is limiting the private businesses that need credits from assessing funding for business expansion and growth. Nigeria, like many developing countries, is plagued by increasing government expenditures, unmatched by government revenue. The use of government domestic debts to fund government expenditure are also found to have significant crowding-out effect on private investment. This result justifies the findings of James *et al.* (2016), Anyanwu & Erhijakpor (2014) who in their studies reported a significant negative impact of domestic debts on economic growth in Nigeria in the long and short run.

The coefficient of Public External Debt (LOGPED) also parades a significant negative effect on economic growth in the long run that is significant at one percent level. In conformity with a priori expectation, a unit increase in external debt is associated with about 6 percent fall in economic growth, *ceteris paribus*. Borrowing is expected to stimulate economic growth if properly managed and applied to finance the provision of critical infrastructure. However, Krugman (1988) contradicts this view by mentioning external debt as one of the factors hampering economic growth as huge borrowing leads to high indebtedness, debt traps and slow down of economic growth. According to him, accumulated debt stock results in higher tax (tax disincentive) on future output and thus crowds out private investment. The result is in line with Sanya & Abiola (2015), Mbah *et al.* (2016) and Dladla & Khobai (2018) who established a significant long run impact of external debts on economic growth in Nigeria and South Africa respectively.

The long run coefficient of Fiscal Stance (FCS) exhibits a negative effect on economic growth that is significant at 5 percent level. Confirming a priori expectation, the results indicate that current fiscal policy of increased use of budget deficits to stimulate economic growth is not sustainable and would lead to a decrease in economic growth by about 13.79 percent. The finding of this study indicates that the impact of fiscal deficit on RGDP is mild but negative and significant at the 5 percent level. This contradicts the Keynesian theory, but is in accord with neo-classical theory which asserts that fiscal deficits lead to a drop in the GDP. Nevertheless, the government must strive to keep deficit under control, not to hamper growth, and expenditure. The result corroborated the findings from extant studies by Sanya & Abiola (2015), Chikezie *et al.* (2017) and Hussain and Haque (2017) who reported a significant negative impact of fiscal deficit on economic growth in Nigeria and Bangladesh respectively.

The long run coefficient of the structural break variable (DUMSB) exhibit a positive effect on economic growth that is not statistically significant. The structural break year (2011) was an election year in Nigeria. The coming to power of President Jonathan, a southerner from the Niger Delta region in 2011 brought some relative peace to the Niger Delta region that made it possible for the government to maximize oil production output in the face of rising oil prices. This led to a significant increase in government revenue that allows the government to strengthen its balance of payment position and build its foreign reserve position. Foreign inflows to the government bond market, portfolio investment inflows also increased in the absence of an oil price shock during this period contributing to the positive impact of the structural break date on economic growth.

5.3.7. Analysis of Short-Run Co-integration Relationship of the Growth Model

The results of the short run dynamics emanating from the long run relationships associated with the ARDL model is presented in table 3. The behaviour of the variables did not change much in the short run both in terms of the signs and the significance of their coefficients. All the variables in the model were statistically significant except PPT. As evident in table 3, the coefficient of the error correction model, that is, the co-integration equation (CointEq(-1)) is found to be statistically significant at 1 percent level and has the expected negative sign. This further affirms the existence of long run relationship between the variables in our model and shows the speed of adjustment to restore equilibrium following a disturbance. The results of the co-integration equation suggest that any shock to the model is totally adjusted at the rate of about 48.94 percent per year. The pace of adjustment is reasonably fast and thus, a shock will take about 2.04 years

to fully recover and restore the economy back to long run equilibrium growth path.

Table 3
Short Run Error Correction Model Results for ARDL (1, 0, 2, 2, 0, 1, 2, 1, 2, 2, 0)
Economic Growth Model

<i>Variables</i>	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-Statistic</i>	<i>Probability</i>
D(LOGPPT)	-0.001733	0.006765	-0.256117	0.8022
D(LOGCIT)	0.151428	0.035650	4.247637	0.0011
D(LOGCIT(-1))	0.227826	0.026532	8.586870	0.0000
D(LOGPIT)	-0.023646	0.006946	-3.404421	0.0052
D(LOGPIT(-1))	0.092550	0.010331	8.958121	0.0000
D(LOGCED)	0.068480	0.012565	5.450169	0.0001
D(LOGGCE)	-0.087012	0.010139	-8.582265	0.0000
D(LOGGRE)	0.095432	0.016683	5.720255	0.0001
D(LOGGRE(-1))	-0.069354	0.015610	-4.442909	0.0008
D(LOGGDD)	-0.063651	0.008140	-7.819266	0.0000
D(LOGPED)	-0.049585	0.009675	-5.125257	0.0003
D(LOGPED(-1))	0.015567	0.007908	1.968561	0.0725
D(FCS)	-0.034265	0.005858	-5.848818	0.0001
D(FCS(-1))	0.048646	0.006288	7.736668	0.0000
DUMSB	0.064943	0.019690	3.298364	0.0064
C	8.799294	0.605509	14.532067	0.0000
CointEq(-1)	-0.489363	0.033892	-14.439041	0.0000

Cointeq= LOGRGDP – (-0.0025*LOGPPT + 0.4899*LOGCIT – 0.0663*LOGPIT + 0.1551*LOGCED – 0.2737*LOGGCE + 0.2258*LOGGRE – 0.4394*LOGGDD – 0.0601* LOGPED – 0.1379*FCS + 0.1163*DUMSB).

Source: Author's Computation using Data from Central Bank of Nigeria and National Bureau of Statistics (1980-2017).

The short run coefficient of Petroleum profit tax D(LOGPPT) exhibit a negative effect on current level of economic growth that was not statistically significant. The inflow of oil revenue has not made any significant improvement in the lives of Nigerians and the economy as a whole. Consequently, the study findings revealed that the contribution of petroleum profit tax in Nigeria has no significant impact on economic growth in both the short and the long run.

The coefficient of the present rate of Company Income tax variable, consistent with apriori expectation, displayed a positive impact on current economic growth that is significant at 1 percent level. Specifically, a unit increase in the present CIT rate (LOGCIT) causes a 15.14 percent increase in current rate of economic growth while a unit increase in a year lag of CIT (LOGCIT(-1)) will lead to 22.78 percent increase in the current rate of

economic growth in the short run. The short run coefficient of present rate of Customs and Excise Duties (LOGCED) is also positively related with the current rate of economic growth and significant at one percent level. The result shows that one percent increase in present CED rate will increase current economic growth by 6.85 percent in the short run. This is attributed to the fact that increased tax revenue invested in social and physical infrastructures promotes economic growth.

The short run coefficient of present Personal Income Tax (LOGPIT) variable in line with a priori expectation, parade a significant and negative impact on current rate of economic growth that is significant at one percent level. Distinctively, an increase in the present PIT (LOGPIT) rate will lead to 2.36 percent decrease in current economic growth. However, a unit increase in one year lag of PIT (LOGPIT(-1)) rate will increase economic growth by 9.25 percent. Confirming a priori expectation, the short run coefficient of present Government Capital Expenditure (LOGGCE) is negatively related with current level of economic growth and significant at one percent levels. Expressly, a one percent increase in present GCE will decrease the current level of economic growth by 8.70 percent. This implies that present rate of GCE is negatively related to the current level of economic growth in Nigeria. Contrary to a priori expectation, the short run coefficient of present Government Recurrent Expenditure (LOGGRE) is positively related to the current level of economic growth and significant at one percent level. Explicitly, a one percent increase in present GRE causes an increase in the current level of economic growth by 9.54 percent. However, the immediate lag of GRE (LOGGRE(-1)), reveal that a one percent increase in one period lag of the variable causes a decrease in the current level of economic growth by 6.93 percent.

Confirming a priori expectation, the short run coefficient of present level of Government Domestic Debts (LOGGDD) is negatively related to the current level of economic growth and is significant at one percent level. Exclusively, a percentage increase in the present level of government domestic debts will lead to a fall in current level of economic growth by 6.36 percent. The result suggests that high level of domestic borrowings used to finance payment of salaries and running cost of over-bloated civil service, bloated budgets and bureaucracy will negatively affect current rate of economic growth in Nigeria. Contrary to a priori expectation, the short run coefficient of present level of Public External Debts ((LOGPED) is negatively related to the current level of economic growth in Nigeria and is significant at one percent level. Expressly, a percentage increase in the present level of public external debt causes a 4.96 percent fall in the current level of economic growth. However, the coefficient of the one year period

lag of the variable (LOGPED(-1)) showed a positive relationship between previous level of external debts and current economic growth that is not statistically significant.

The short run coefficient of the present level of Fiscal Stance (FCS) indicated a negative impact on current rate of economic growth that is significant at one percent level. This implies that a unit increase in the present level of fiscal stance will lead to a fall in current rate of economic growth by approximately 3.43 percent. However, a one period lag of fiscal stance (FCS(-1)) show the opposite effect of increasing current level of economic growth by 4.86 percent . The results show the changing impact of government sector on the economy over time. The coefficient of the structural break dummy variable D(DUMSB) is positively related to economic growth and significant at one percent level. The implies that the stable macroeconomic environment witnessed after the 2011 general elections contributed positively in increased government revenue arising from increase oil price and production levels in the Niger Delta region thus stimulating growth of real GDP in Nigeria.

4.4. Short-Run Econometric Diagnostics Tests

The results of the short-run diagnostics test are contained in table 4. The Jarque- Bera test was used to check the distribution of errors resulting from regression. The results of the Jarque- Bera test shows that the p-value of 0.092613 is greater than 0.05 which implies that the residuals are normally distributed. The Breusch-Godfrey Serial Correlation LM test is used to check for serial correlation. Since the p-value of the F-statistic of 0.1018 is greater than 0.05, it implies that there is no serial correlation in the residuals of the model and we therefore conclude that our model is robust to serial correlation. The Breusch-Pagan-Godfrey test was used to check for heteroskedasticity in this study. The p-values of the F-statistic of 0.2447 is greater than 0.05, an indication that our model does not suffer from heteroskedasticity. This implies that the residuals of the model are homoscedastic. The Ramsey Reset test used to check for functional form, has a probability of F-statistic of 0.9920 which is also greater than 0.05

Table 4
Short-run Diagnostics Tests Results

<i>Test</i>	<i>Null Hypothesis</i>	<i>Obs. R-square</i>	<i>Prob. Value</i>
Jarque-Bera	There is Normal Distribution	4.759644	0.092613
Breussch Godfrey	No Serial Auto-Correlation	4.569763	0.1018
Breusch-Pagan-Godfrey	No Heteroscedasticity	27.26892	0.2447
Ramsey RESET	No mis-specification error	0.000105	0.9920

Source: Author's Computation using E-views 9.5

percent. We accept the null hypothesis and conclude that there is no problem of misspecification in our model. The short run models were found not to be spurious because the Durbin-Watson statistics (2.120943) is greater than the R^2 (0.998109).

4.5. Stability Tests

The stability of long run parameters was examined by applying Cumulative Sum of recursive residuals (CUSUM) and Cumulative Sum of Squares of recursive residuals (CUSUMSQ) tests. An inspection of the CUSUM and CUSUMSQ graphs (Figures 1 and 2) from the recursive estimates of the model reveals that there is stability and no systematic change is detected in

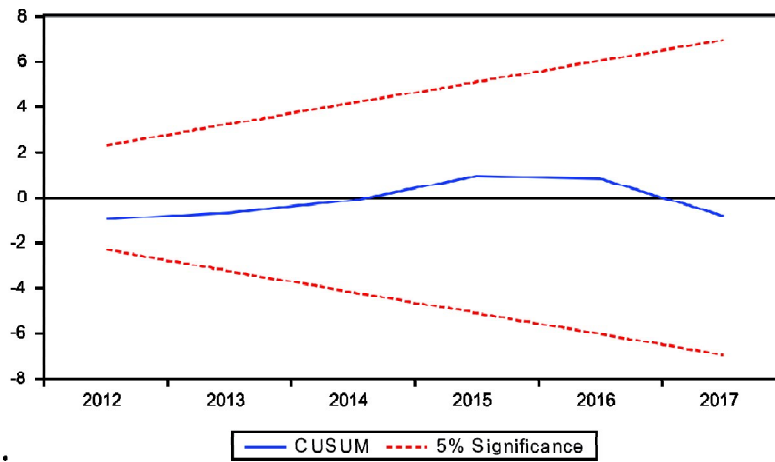


Figure 1: Stability Test, (CUSUM)

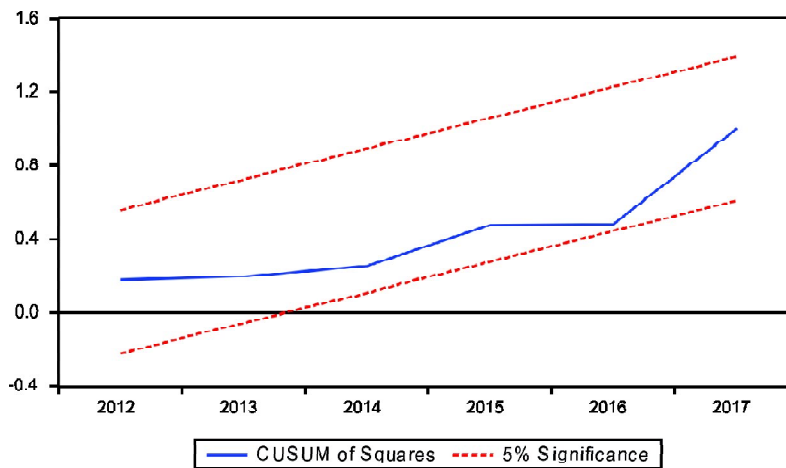


Figure 2: Stability Test (CUSUM of Squares)

the coefficient at 5% significant level over the sample period. Finally, the regression for the underlying ARDL model fits very well and passes all the diagnostics tests against serial correlation, normality and heteroskedasticity. We therefore conclude that this model is well specified as it passes both the residual and stability diagnostic tests.

5. Conclusion and Recommendations

The main objective of this study is to investigate the impact of tax revenue shocks on economic growth in Nigeria. Time series data obtained from secondary sources for the period 1980-2017 were used for the study. The Augmented Dickey Fuller (ADF) and Phillips-Perron unit root tests shows that the variables are integrated of order zero and one with none integrated of order two. The Zivot-Andrews structural break unit root test indicated revenue shocks date of 2014, 2015, 2011 and 2003 for PPT, CIT, PIT and CED while the control variables exhibited structural break dates of 1999, 2011, 2015 and 2005 for GCE, GRE, GDD and PED respectively. The ARDL bounds test results established the existence of a long run relationship between tax revenue and economic growth in Nigeria in the study period. The coefficient of co-integration equation which measure the speed of adjustment to long run equilibrium indicated that 48.93 percent short run departure from long run equilibrium are corrected each year. The study has implication for a small tax base to cover government spending. Higher tax revenue is strongly correlated with increased economic growth. The proportion of tax contribution to growth rate in Nigeria falls short of the optimal level in terms of the volume of economic activities and value of total output. Nigeria lags other African countries with respect to tax effort and as such has a huge untapped potential for enhanced revenue mobilization. The study therefore recommends that government should institute an appropriate tax system with emphasis on broadening the tax base and in some cases, reviewing upwards the tax rates in order to increase the tax effort as well as ensure optimal contribution of taxation to economic growth. The current low tax regime in Nigeria is induced by the heavy dependence on oil resources. With persistent fall in oil revenue and its volatile nature; there is need for the Nigerian government to reconsider its tax policy as a veritable source of government revenue. However, this does not necessarily imply that government should increase the rates of different taxes or create new taxes. As there is a large share of potential tax resources that is not being collected by the tax system, a credible strategy would be to look for ways to improve the tax collection system by capturing as many High Net Worth individuals as possible into the tax net. Any attempt to increase the overall tax burden by raising tax rates without improving the

efficiency of the tax collection system will be counter-productive. Increase in taxes is likely to encourage tax evasion and push economic activity underground. Additional efforts should be geared towards diversification of the revenue base from unpredictable oil revenue to sustainable non-oil revenue sources that will serve as shock-absorbers against oil price volatility while revenue generated from taxes should be effectively applied to develop and grow the economy. Fiscal policy adjustment that reduces unproductive expenditure and protects expenditure in the social sector can lead to faster growth. The level of government expenditure should be set so as to avoid huge deficits leading to debt financing and the crowding-out effect of private investment.

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