Macroeconomic Determinants of Tax Revenue in Nigeria (1970-2011)

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Abstract: The Nigerian government in recent has engaged in search for the appropriate policy strategy to stimulate tax revenue and boost the revenue profile of the government. This paper therefore attempts to examine the most relevant macroeconomic policy variable that can serve as an anchor variable for achieving such policy objective. The paper uses secondary data from Nigeria economy for the period 1970 to 2011 and adopted the error correction mechanism to establish both the long run and short run relationships among the variables. The main finding of the empirical analysis is that tax revenue tends be significantly responsive to changes in income level, exchange rate and inflation rate. The income elasticity of tax shows that a unit percent increase in income level will probably lead tax revenue increase by 0.63% in the immediate and 0.33% in the second year. The evidence is in consonance with findings from previous studies in this area, especially [1, 2]. The paper concludes that macroeconomic instability and level of economic activities are the main drivers of tax buoyancy and tax effort in Nigeria

Key words: Tax Efforts · Tax buoyancy · Economic Growth · Macroeconomic Instability Fiscal Policy

INTRODUCTION

The economic resources available to society are limited and so an increase in government expenditure, then government needs to raise revenue to meet her fiscal responsibility. Taxation is one method of transferring resources from the private to the public sector, but there are other avenues of raising revenue, by printing new notes, to charge for the goods and services government provides or to borrow. Each of these financing options has its own 'good' and 'bad' effects. Taxation has its limits as well, but they considerably exceed the amounts that can be raised by resorting to the printing press, charging consumers directly, or borrowing. So while governments often use all methods of raising resources, taxation is usually by far the most important source of government revenue, [2]. In Nigeria, tax revenue has risen steadily over the course of past few decades. Such significant increases in taxation raise a question of what effects they have had upon economic growth. The country's revenues were largely derived from primary products. Between 1960 and the early 1970s, revenue from agricultural products dominated, while revenue from other sources was considered as residual. Since the oil boom of 1973/74 to date, oil has dominated Nigeria's revenue structure and its share in federally collected revenue rose from 26.3 per cent in 1970 to 81.8, 72.6 and 76.3 in 1979, 1989 and 1999, respectively [3] Over the past two decades oil has accounted for at least 70 per cent of the revenue, thus indicating that the Nigerian revenue base is dominated by oil revenue. Instead of transforming or diversifying the existing revenue base, fiscal management has merely transited from one primary product-base revenue to another, making the economy susceptible to fluctuations of the international oil market. Some studies like [4,5] stress that countries receiving large revenues from natural resource endowments typically raise less revenue from domestic taxation and that this creates governance problems because the lower domestic tax effort reduces the incentive for the public scrutiny of government.

In Nigeria, the tax system has been one of the victims of numerous economic crises that have plagued the country since 1966. Tax collections are still very low

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leading to large fiscal deficits. The country has also suffered from over-dependence on a small number of sources of tax revenue, which are vulnerable to external shocks and remain a crucial problem in the tax system. A combination of good governance, improved tax administration, credible macroeconomic policies and other discretionary tax measures has resulted in an improved tax to GDP ratio, when compared to the 1980s, which however is still very low compared with other countries. The failure of the tax system to generate sufficient revenue has led to the government running unsustainable deficits. The fiscal deficit is the core issue of most of the developing countries over the past several decades. The reason behind the large increase in fiscal imbalance is the rapid expansion in expenditure and low revenue collection. Recent endogenous growth model have demonstrated that growth can be achieved by reducing fiscal imbalance, which can be achieved either by lowering expenditure or increase tax revenue. However, many developing countries have used option of reducing expenditure by reducing expenditures in case of health, education and infrastructure and other are raising tax revenue.

The aim of this paper is to examine the determinants of tax revenue in Nigeria while several studies [6-10] our perusal of existing studies show a death of such studies on Nigeria. Therefore, there is need to examine determinant of tax revenue also with data from Nigerian economy. In Nigeria, despite government efforts through the implementation of various macroeconomic policies to increase revenue especially from non-oil sources to sustain economic growth since the early 1970s, the success recorded has been insignificant. This study, therefore, analyses tax revenue performance in Nigeria using time series data over the period of 1970 to 2010. The rest of the paper is divided into four sections. Section 2 reviews literature on determinant of tax revenue. Section 3 provides methodology while section 4 presents the analysis and the empirical result of the study. Section concludes with policy implication.

Review of Empirical Studies: Several studies have been done on tax revenue due to the fact that, it is an area that deserves attention in economic development. There are studies that aimed at examining the determinant of tax revenue on one hand while some have examined the determinant of sustained revenue profile thereby facilitating effective management of a country's fiscal policy, among others. In a study on Pakistan and India [11] used two simple regression lines for the two countries. Total revenue of both countries was taken as

dependent variable and direct and indirect taxes were taken as independent variables. They found that in Pakistan, more revenue is charged by levying indirect taxes where as India is on the opposite side of it. Pakistan has a favorable policy for employing indirect taxes whereas India generates its more revenue through direct taxes. Pakistan is failing to reduce its fiscal deficit despite large parts of the country's economy, including rich landlords, not being taxed. The tax-to-GDP ratio is only 10.2%, one of the world's lowest. About 65% of the country's budget goes to debt retirement, defense expenditures and the current expenditures of the government, while 60% of the economy is outside the tax net [11].

Another study [12] analyzed 25 countries cross section data for the year 1998 to 2008 and used pooled least square method for result analysis. The result shows that import, manufacturing sector, services sector, monetization and budget deficit influence positively the tax buoyancy while growth in grants impact negatively on tax buoyancy. The growth of agriculture sector has insignificant impact on tax buoyancy in case of developing countries because they are not taxed or under taxed. Unlike many of the past studies which found insignificant impact of service sector on tax buoyancy this study found positive and significant impact on tax buoyancy due to the development of service sector in 1990s. Increase monetary growth also influence positively on tax collection because increase in monetization cause documentation of transaction which improves tax buoyancy. They concluded that increase in budget deficit has positive influence on tax collection by demanding more resource mobilization from the governments however, at the same time the growth in grants inversely influences on tax collection because government in developing countries avoids unpopular steps of imposing taxes for domestic resource mobilization.

Study by [2] evaluated the determinants of VAT revenue in Kenya. The paper used [13] fundamental general equilibrium analysis of the public sector to derive its main results and finds that growth elasticity for VAT is greater than one. The estimation results show that total GDP elasticity of VAT revenues is less than the elasticity with respect to monetary GDP, suggesting the existence of an underground economy in Kenya over the period of analysis. It is found that VAT revenues respond with substantial lags to changes in its determinants and that VAT revenues are sensitive to unusual circumstances. The study concludes that Kenya's VAT revenue is very responsive to changes in their determinants especially

international trade. There is therefore the challenge of creating a stable VAT system so that tax revenues can increase rapidly as the economy grows. Another study [14] uses time series data for Uganda during 1970-2000 to analyze the determinants of tax revenue share in Uganda. The results of the study demonstrate that tax evasion is a menace to tax revenue, as it is negatively significant in the model. All the variables identified in the study seem to affect total tax revenues. The effect of the variables on individual taxes varies, but in general agriculture ratio, population density and tax evasion, affect all taxes. Aid variable showed positive sign since aid in Uganda always supported imports especially raw material so not surprisingly. The trend variable indicates that all taxes have increased over the period. Similarly [15] works on the determinants of Low Tax Revenue in Pakistan. The results obtained suggest that openness, broad money, external debt, foreign aid and political stability to be the significant determinants of tax efforts, with expected signs of the estimated coefficients. Agriculture share, manufacturing share and service sector share turn out to be insignificant and the sign of the coefficient of agriculture share deviates from expectations and same as the sign of GDP per capita and urbanization. The findings of a study [16] on Malaysia suggest that tax knowledge has a significant impact on tax compliance even though the level of tax knowledge varies significantly among respondents. The results also indicate that tax compliance is influenced specifically by probability of being audited, perceptions of government spending, penalties, personal financial constraints and the influence of referent groups.

A study [17] on tax effort and the determinants of tax ratio in Sub-Sahara Africa uses an unbalanced panel dataset which covers 46 sub-Sahara African countries over the period 1990 to 2006. The result indicates that the resource sector does generate large taxable surpluses and therefore countries with high resource revenues tend to have high tax ratios. Similarly [18] assess the rationality of tax revenue used a panel data on 26 Swiss cantons over 1980-2007. The result shows that actual tax revenue are systematically underestimated on average, forecasts often fail to incorporate available information efficiently and political factors explain part of the tax revenue budgeting errors. In another study based on a large sample, determined by 143 countries panel data, from 1996 to 2010, [19] shows that the interest variable is significant and negatively correlated with tax revenues.

Using a panel of 78 developing countries over the period 1990-2005, [20] provides econometric evidence that democracy matters for achieving higher domestic tax revenues which are much needed to finance public goods. The results from [20] suggest a positive and significant relation between the level of democracy and the domestic tax revenue as part of GDP. A number of regularities among the control variables emerge. It was observed that an higher agricultural sector lead to significantly lower domestic taxes whereas the imports as share of GDP is positively and significantly related to domestic tax revenues. The coefficients of the level of per capita GDP and of inflation are positive though not significant. The paper concluded that high levels of democracy are needed in natural resource rich countries to make natural resource rents contribute to higher domestic tax revenues. In Using data from OECD and less developed economies [21] explained the determinants of tax revenue. The paper used the non-agricultural share of GDP, openness and the rate of population growth all of which showed the positive and statistically significant result. Simple correlation between tax effort and the size of shadow economy showed the negative but statistically significant result. The paper measured the buoyancy and elasticity of tax revenue system in Pakistan over the period 1974 to 2003 by using the Divisia Index Approach and analyzed the factors responsible for the resulting size of elasticity coefficients. The result suggests that tax changes do not lead to significant revenue augmentation however high coefficient of sales tax with respect to GDP base reflected the inclusion of service sector and utilities in sales tax net, which has serious implications for poor.

On the determinants of tax share and revenue performance for Bangladesh along with 10 other developing countries [22] finds international trade, broad money, external debt and population growth to be the significant determinants of tax efforts. The study concluded that Bangladesh and other countries have low tax effort (less than unity index) and are not utilizing their full capacity of tax revenue and therefore have the potential for financing budgetary imbalance through raising tax revenue. In earlier study [23] estimated by using the panel of 66 developing countries over the period 1990-2005 found also that democracy influence domestic tax revenue, properly correcting for the endogeneity of democracy with an original instrument. The paper found the strong evidence that the political regime in a country influence the extent to which domestic tax reforms are implemented and higher domestic revenues achieved.

The foregoing review of literature shows that while there is substantial evidence in the literature on the determinant of tax for many Asia countries less attention

is paid to Africa countries. Nigeria is contemplating review it tax policy and as a result effort is being made to find the most appropriate macroeconomic policy strategy to stimulate tax revenue. In view of this and the fact that less attention is paid to tax determinants in African countries like Nigeria, this paper contributes to the literature in this respect.

MATERIALS AND METHODS

Data Description and Sources: Based on evidence from existing literature especially [2, 14, 15, 17, 21, 23] this paper identifies five main macroeconomic variables (Real GDP (GDP), Openness (OPN), the official Exchange rate (EXH), Inflation rate (INF), the ratio of external debt to GDP (DET)) that are likely to have direct impact on tax revenue(Tax to GDP ratio (*TAX),* in Nigeria. Real GDP per capital measures the growth of economic activity Increase in Real GDP will cause increase in the revenue through sales tax, value added tax, excise and corporate income tax etc. the expected sign of this variable is positive. The official exchange rate was measured by the official naira to US dollar exchange rate available in the Central Bank of Nigeria Statistical Bulletin. Currency appreciation (which represent a decrease in exchange rate) could potentially lead to a higher volume of imports and higher trade revenue. Hence, a negative relationship is expected between exchange rate and trade revenue. Inflation rate (INF) is measured from changes in the prices of final goods that is Consumer Price Index. It gives the cost in Naira of a given list of goods and service overtime.

The ratio of external debt to GDP was measured by debt per capital. In many less developed countries like Nigeria, a high level of public spending often leads to large fiscal deficits and an increase in public debt. The interest on debt and the debt itself is often paid with current tax revenue. Thus, this may result in raising tax revenue in order for the government to finance large debt. Hence, it is expected that public debt is positively related to tax revenue. The data consist of annual time series, covering period from 1970-2011. The sources of variable include various issues of Central Bank of Nigeria (CBN) publication namely; Statistical Bulletin Annual Report and World Development Bulletin (2012). In view of general concerns about the properties of macroeconomic time series, both the unit root test and cointegration properties of the variables were examined. The ADF test was conducted and the vector error correction mechanism was used to estimate the model. The results of various tests are presented in the preceding sections.

Model Specification: To investigate the dynamic relationship among tax variable and the five main macroeconomic variables (Real GDP (GDP), Openness (OPN), the official Exchange rate (EXH), Inflation rate (INF) and the ratio of external debt to GDP (DET)) this study specified a model which expresses tax as a function of these macroeconomic variables. The model is specified as follow:

$$TAX = f(GDP, OPN, EXH, INF, DET) \tag{1}$$

The functional form of the model is

$$TAX = \alpha_0 + \beta_1\, GDP_t + \beta_2 OPN_t + \beta_3 EXH_t + \beta_4 INF_t + \beta_5 DET_t + \varepsilon_t \tag{2}$$

where; TAX = Tax to GDP ratio, a = Tax intercept, GDP= Real GDP, OPN = trade Openness, EXH = The official Exchange rate, INF = Inflation rate, DET = the ratio of external debt to GDP, ε = Error term.

To capture the dynamic relationship between the variables in equation (2) we adopt the conventional Granger and Engel 2-stage error correction method [24]. The method allows us to systematically determine the most important tax determinants from an array of variables and their lag structures. It also allows us incorporate the feedback effects from the long run model into the short run dynamic analysis. The co-integration which is a property of long run equilibrium provides information about the long run relationship among the variables while the short run phenomenon provides information on the short run dynamics among the variables. Therefore, equation (2) can be expressed in dynamic autoregressive distributed lag model as follows:

$$X_t = A_0 + \beta_1 X_{t-1} + \beta_2 X_{t-2} + \beta_3 X_{t-3} + \ldots\ldots + \beta_q X_{t-k} + \varepsilon_t \tag{3}$$

where: $X_t = [TAX\ GDP\ OPN\ EXH\ INF\ DET]$ equation (3) can be written more compactly as:

$$X_t = \alpha_0 + \beta_1 \sum_{j=1}^{k} X_{t=j} + \varepsilon_t \tag{4}$$

equation (4) can be written in a more parsimonious ECM form as:

$$\Delta X_t = A_0 + \Pi X_{t-1} + \sum_{j=1}^{k} \Gamma_j \Delta X_{t-j} + \varepsilon_t \tag{5}$$

where Δ is the difference operator, X_t is a $6x1$ – dimensional vector of non stationary I(1) endogenous variables of the model, α_0 is a $6x1$ - dimensional vector of constant and ε_t is k-dimensional vector of the stochastic error term normally distributed with white noise properties $N(0,\sigma^2)$. Ï is the long run matrix that determines the number of co-integrating vectors that consist of α and β representing speed of adjustment towards long run equilibrium and long run parameter respectively. Γ is the vector of parameters that represents the short term relationship.

RESULTS

Stationarity and Co-Integration Tests: The conventional starting point of analyzing macroeconomic data is to determine the underlying properties of the process that generate the time series variables employed. The Augmented Dickey Fuller (ADF) is used to test the order of integration of the variables. The results of the ADF test are presented in Table 1 and the results show that all the series are non-stationary at level. The null hypothesis of no unit roots for all the time series are rejected after their first differences since the ADF test statistic values are less than the critical values at 1% levels of significance. Thus, the variables are stationary and integrated of same order, i.e., I (1). However, the application of the ADF test to the inflation rate (logINFR) revealed that this variable is stationary in both its levels and its first differences. In this case, INFR does not need further differencing.

To examine the long run relationship among the variables, cointegration test within the Johansen VAR framework is conducted. Table 2 reports both the Johansen cointegration trace test and maximum eigenvalues. By starting with H_0: r = 0 (no cointegrating relations), the null hypotheses are rejected till H_0 = 3. In testing H_0 = 3, the null hypothesis is not rejected at 0.05 sig (i.e the critical value of 29.79 > trace statistic of 27.47). The result suggests 3coninintegrating equations. The results reveal that at least 3cointegrating vectors exist among the variables of interest. In other words, this trace test result does not reject the null hypothesis that these three variables are not cointegrated. The Eigen value test also confirms one cointegrating vector. This result confirms the existence of long run relationship between tax variable and the macroeconomic variables included in the model.

Results of Dynamic Error-Correction Model: Having identified the possibility of cointegration among the variables using Johansen test, this section investigates the short run response of tax revenue to its determinant. At first, an over-parameterize equation is obtained. The over parameterized error correction models for the economic growth model equation is presented in Table 3. The model lag is set at three to ensure that the dynamics of the models are not constrained by too short lag length. However, these models seem difficult to interpret; therefore these models were reduced to a more interpretable and certainly more parsimonious models. After various stepwise eliminations of insignificant dynamic variables from over-parameterized equation, we arrive at parsimonious equation. The resulting Schwarz Information criterion (SC), Akaike Information Criteria (AIC) and Log Likelihood (LR) statistic are used as guide to parsimonious reduction A fall in these values (in absolute term) is indication of model parsimony.

Table 4 reports the parsimonious estimates of the model. An examination of both the over-parameterized and the parsimonious equations shows that there is no serial autocorrelation given that the Durbin Watson Statistic is within the acceptable bounds. The explanatory variables explain well over 82 percent of the variations in tax revenue. This is adjudged by the value of the coefficient of determination. This shows the goodness of fit on the regression line. R^2 (Adjusted co-efficient of multiple determinations) shows that even if all the missing variables are included, 53% of the variations in tax revenue will still be explained by GDP, exchange rate, external debt and inflation rate. The overall regression (F-stat) is significant at 5%.

The results of the dynamic short run parsimonious model show that except trade openness and external debt which are not significant in any of simulated lag periods, all other variables such as GDP, exchange rate, inflation rate have significant relationship (expected sign). By implication, tax revenue tend be responsive to economic growth, exchange rate and inflation rate with statistically significant effects. By observing the parsimonious model, it is noted that some variables in the original over-parameterize specification, such as the second and third periods lag of Gross Domestic Product (GDP), lag periods of inflation rate (INFT) and exchange rate (EXCH), have been dropped from the final estimated equation. This is because they have insignificant coefficients in all experimental runs. Trade openness and external debt are not significant for the current period and lag periods in all the experimental runs. However these variables meet apriori expectations in the model. Accumulation of external debt tends to drain the revenue base from taxes. In likely assertion, the trade openness for Nigeria has had positive effect on revenue generated from taxes through

Table 1: Augmented Dickey Fuller Test

Variable	ADF Statistic at Level		ADF Statistic at First Difference		Order of Integration
	Without Trend	With Trend	Without Trend	With Trend	
LogRTAX	-0.057421	-1.911942	-6.581529*	-6.964890*	$I(1)$
LogTGDP	-2.395646	-2.012615	-5.803137*	-6.149316*	$I(1)$
LogOPNS	-1.423863	-1.085846	-2.824918**	-2.647288*	$I(1)$
LogEXR	0.027215	-2.071398	-5.106920*	-5.051205*	$I(1)$
LogINFR	-5.421588*	-5.324567*	-6.484771*	-6.455139*	$I(0)$
LogEXTD	-1.762369	-0.092829	-4.756419*	-5.13*	$I(1)$

*(**) significant at 0.05 (0.10) critical level

Table 2: Co integration Test Results

Trace Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.734557	133.3538	95.75366	0.0000
At most 1 *	0.585126	82.95231	69.81889	0.0031
At most 2 *	0.440228	49.52069	47.85613	0.0346
At most 3	0.341012	27.47212	29.79707	0.0906
At most 4	0.195405	11.62420	15.49471	0.1759
At most 5	0.084682	3.362372	3.841466	0.0667

Trace test indicates 3 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

Maximum Eigen value Test

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.734557	50.40151	40.07757	0.0025
At most 1	0.585126	33.43162	33.87687	0.0564
At most 2	0.440228	22.04857	27.58434	0.2179
At most 3	0.341012	15.84792	21.13162	0.2339
At most 4	0.195405	8.261831	14.26460	0.3527
At most 5	0.084682	3.362372	3.841466	0.0667

Max-eigenvalue test indicates 1 cointegratingeqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

various indirect taxes on imported goods, petroleum profit tax, royalties etc. The income elasticity of tax shows that a unit percent increase in income level will probably lead tax revenue increase by 0.63% in the immediate and 0.33% in the second year lag.

The evidence is in consonance with findings from previous studies in this area, especially [1, 2]. In a similar vein, exchange rate appreciation (DLEXCR) has the theoretically expected positive sign and 1% appreciation in the previous year value of exchange rate will lead to 0.35% increase in the current tax revenue. The coefficient value is significant at 0.05 significance level which implies that previous magnitudes of exchange rate in Nigeria has a lot of input to provide in determining the current value of tax base in Nigeria. The level of influence exacted by inflation rate on tax revenue is felt in the immediate period.

For instance, the rate of response of tax base in Nigeria to change in inflation is significant at current period. Tax revenue tends to generate an immediate response to 1% change in inflation by 0.07%. Looking at the parsimonious model, the speed of adjustment as indicated by the error correction variable ECV in the model is significant at 5%. Besides, the results show that the coefficient of the ECV for the estimated model is both statistically significant and negative. The significance of the ECV is an evidence of significant speed of readjustment of disequilibrium between the tax revenue and economic growth and other determinants. The negative sign indicates that the tax revenue is below equilibrium level. The speed of adjustment coefficient of -0.47 denotes that 47% of any past deviation will be corrected in the current period.

Table 3: Over-parameterize Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRTAX(-1))	-0.168197	0.268952	-0.625380	0.5418
D(LTGDP)	-0.362198	0.251283	1.441397	0.1715
D(LTGDP(-1))	0.371558	0.252814	1.469687	0.1638
D(LTGDP(-2))	0.178396	0.254711	0.700386	0.4952
D(LTGDP(-3))	0.190096	0.268838	-0.707101	0.4911
D(LOPNS)	-0.015060	0.075356	-0.199856	0.8445
D(LOPNS(-1))	-0.155214	0.219165	-0.708204	0.4904
D(LOPNS(-2))	-0.114450	0.186454	-0.613828	0.5492
D(LOPNS(-3))	-0.091656	0.174657	-0.524779	0.6079
D(LEXTD)	0.081622	0.148408	0.549985	0.5910
D(LEXTD(-1))	0.126785	0.185609	0.683076	0.5057
D(LEXTD(-2))	0.066657	0.181822	0.366605	0.7194
D(LEXTD(-3))	-0.096367	0.160845	-0.599129	0.5587
D(LEXR)	-0.347851	0.268473	-1.295666	0.2160
D(LEXR(-1))	-0.336351	0.366498	-0.917743	0.3743
D(LEXR(-2))	0.367915	0.341054	1.078759	0.2989
D(LEXR(-3))	0.541051	0.437522	1.236626	0.2366
D(LINFR)	-0.157876	0.072437	-2.179493	0.0469
D(LINFR(-1))	-0.161949	0.093751	-1.727425	0.1061
D(LINFR(-2))	-0.188294	0.090353	-2.083983	0.0560
D(LINFR(-3))	-0.069906	0.053246	-1.312897	0.2103
ECV(-1)	-0.873379	0.273439	-3.194051	0.0065
C	0.210125	0.152523	1.377654	0.1899
R-squared	0.820652	Mean dependent var	0.083059	
Adjusted R-squared	0.538818	S.D. dependent var	0.470110	
S.E. of regression	0.319253	Akaike info criterion	0.825718	
Sum squared resid	1.426916	Schwarz criterion	1.827099	
Log likelihood	7.724221	F-statistic	2.911835	
Durbin-Watson stat	2.023005	Prob(F-statistic)	0.021630	

Table 4: Parsimonious Error Correction Model

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LRTAX(-1))	-0.197812	0.133762	-1.478831	0.1500
D(LTGDP)	0.630492	0.142584	4.421884	0.0001
D(LTGDP(-1))	0.339591	0.172194	1.972138	0.0582
D(LOPNS)	0.030327	0.053433	0.567562	0.5747
D(LEXTD(-1))	-0.018498	0.095924	-0.192844	0.8484
D(LEXR(-2))	0.349630	0.166871	2.095217	0.0450
D(LINFR)	-0.071314	0.033467	-2.130897	0.0417
ECV(-1)	-0.466091	0.140387	-3.320040	0.0024
C	0.171943	0.063594	2.703752	0.0113
R-squared	0.721108	Mean dependent var	0.080255	
Adjusted R-squared	0.644172	S.D. dependent var	0.464035	
S.E. of regression	0.276803	Akaike info criterion	0.472375	
Sum squared resid	2.221982	Schwarz criterion	0.860224	
Log likelihood	0.024877	F-statistic	9.372841	
Durbin-Watson stat	2.005386	Prob(F-statistic)	0.000003	

CONCLUSION

The main findings from the analysis level and the growth rate of economic activity impacted positively on tax revenue in Nigeria and that exchange rate depreciation and inflation rate have adverse effect of the tax revenue. Trade liberalization policy seems not to have adversely affected the tax revenue and rather it has positively stimulated revenue generation contrary to expectation. External debt burden also has negative effect on the amount of tax revenue that government can generate. The general conclusion is that macroeconomic instability and level of economic activities are the main drivers of tax buoyancy and tax effort in Nigeria.

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