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Tax revenue structure and its effect on economic growth

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ABSTRACT

Over the years, there have been many arguments on the impact of the government at the grass root. People generally complain about failure of government to provide necessary social amenities and infrastructures in the rural areas. There is need therefore to empirically evaluate the nature of influence tax revenue wields on the grass root economy. This, of course, would assist in establishing the type of tax, from the tax structure, that makes most contribution to the growth of the grassroots economy. This research was carried out to evaluate 'Tax Revenue Structure and its Effect on Economic Growth' on the third tier of government in Nigeria using Calabar Municipal Council as the case study. The study was to determine the impact of revenue structures on economic growth and the dynamics (stability) of the various tax revenue transfers (statutory allocations) to the local government council covering a period of 23 years (1980 to 2002). The main objective of the study was to ascertain the responsiveness of economic growth (GDP) in relation to the various tax revenues accruing to the local government council and how economic growth generates increase in revenue transfers to the municipal council. Secondary data were used for the study. The data collected from secondary source was analyzed using the ordinary least square method to evaluate the impact of tax revenue structures (income variables from the federal, state and local government) on economic growth (GDP). The emerging results, established that increase in revenue from the federal and state government would exert positive effect on the Gross Domestic Product (GDP), whilst increase in internally generated revenue resulted in decline in the GDP. The study ended by making some recommendations thus: Local Governments should mobilize more revenue within their domain to enhance the economic growth at the rural level. The three tiers of government should discourage any fiscal policy that could cause a decline in revenue generation and allocation. Given that tax is a two edged sword it will also help in discouraging further implementation of any tax policy that has a negative effect on the economic growth of the rural area in particular and the whole country generally.

Key Words: *Tax buoyancy, economic growth (GDP), revenue allocation, revenue productivity, revenue stability*

INTRODUCTION

In an economy, some interest groups such as households, firms, public and private sectors often collaborate and participate in the process of economic development. However, the government sector plays a predominant role in achieving the desired changes in the structure of any economy. Indeed, the uniqueness of public sector arises from the fact that, apart from being part of the economy the government sector plays a decisive role in attaining macro-economic objectives of stability, growth and development, through a package of economic policy measures and regulatory framework.

The government sector is defined in IMF (Government Financial Statistics Year Book 1994) as comprising "all units that implement public policy by providing non-market services and transferring income; these are financed mainly by compulsory levies on other sectors. The central government includes all units representing the territorial jurisdiction of the central authority throughout a country".

In Nigeria, government sector includes all the three tiers of government: the federal, state and local government as well as government parastatals. All other agencies that provide public goods as services with funding from the public treasuries also come under government sector. The government sector is often referred to as a public sector given the characteristic of the type of goods and services supplied by the sector. CBN {2000(a)} describes public goods as 'goods possessing the basic characteristics of non-appropriability, non-rivalry and non-excludability in consumption'.

Indeed public goods, are collectively and individually consumed while consumption by an individual does not reduce the amount available to others. Examples of these types of goods are roads and highways, defense and national security as well as other social infrastructures.

It needs be said, that government is saddled with the responsibility of managing the economy. Government does this by formulating and implementing some economic policies such as fiscal and monetary policies. Of course, fiscal policy is designed to achieve the objectives of price stability, economic growth, equilibrium of the balance of payments, and full employment. It is evident that these objectives have wielded strong influence on the economic policy design and development effort of Nigerian governments since independence. It could be accepted that in pursuit of the same macro-economic objectives, Nigerian governments had designed and implemented four development plans between 1960 and 1985. Moreover, Structural Adjustment Programme (SAP) was adopted in 1986 and thereafter, three-year rolling plans followed, all in an attempt to achieve the desired level of economic growth and development and hence improve upon the living conditions of the people down to the grass-root. These objectives are vigorously pursued by the three-tiers of Nigerian government based on the available revenue.

Perhaps there is no exaggeration to say that one issue that has received much attention in Nigeria right from the colonial era is revenue transfer (allocation). This indeed arises from the federal system of government, which has been in operation in the country even before attainment of political independence in 1960. Each of the three tiers of government has responsibilities, which involves large capital expenditure. For instance, the federal government being the first tier of political administration in Nigeria has to provide infrastructure and other necessary social services as education and health facilities. It is also saddled with the primary responsibility of defending the nation's territorial integrity, ensuring security of lives and property, maintaining external relations as well as engaging in productive activities, which the private sector cannot conveniently provide given lack of profit or huge capital outlay. The state government among other things sees to the provision of education, health care, roads and portable water within their boundaries. While the role of local government (third tier), include the provision and maintenance of primary education, markets, and homes for the destitute and in firm, public conveniences and refuse disposal [**1**].

This study, therefore, examines the local government tax revenue in the context of its contribution to general economic growth in Nigeria right from the grass root.

Moreover, the amount of revenue allocated to local councils as well as the other tiers of government depends on what is generated within the whole economy for a period. The size of revenue generated, on the other hand, is influenced by the resource endowment (revenue base), level of economic activity (often provided by Gross Domestic Product, GDP), and the efficiency of the revenue collection machinery [**2**].

There is no doubt therefore that the stability (or instability) and growth of revenue is a function of the ability of the government, at all levels, to stimulate and sustain a high level of economic activity and an optimal mix of revenue generating instruments [**1**]. Thus, the responsiveness of revenue to changes in infrastructures and other resource endowment (revenue base), level of economic activity, and the tax rate has great implications on revenue mobilization at local government level as it does in other tiers of government. A tax is considered flexible, if its yield increases or decreases more than proportionately in response to an increase or decrease in GDP, with the tax parameter assumed unchanged. In other words, where the index of flexibility exceeds unity, the tax or tax group is GDP elastic or flexible. However, where the index of flexibility is less than unity, the tax is GDP inelastic or

inflexible. Such an inflexible tax would suggest a resort over time to discretionary alteration of the tax rate/base if reliance must be placed on revenue productivity of the tax.

The main objective of this study is to evaluate the impact of tax revenues on economic growth at the local government level. Other specific objectives derived from the primary objective are:

i) To ascertain the responsiveness of GDP (Economic Growth) about the various taxes revenue generated and allocated to the local government council.
ii) To investigate individually, the buoyancy or the flexibility of the federal government tax revenue allocation, state government tax revenue allocation to the local government council and internally generated tax revenue of local government council with respect to GDP (Economic Growth).
iii) To statistically determine the dynamics (stability) of the various tax revenue allocation to the local government council with predetermined time dimensions to period estimates of tax flexibility and partly to observe inter-temporal changes, if any in the behavior of flexibility coefficients.
iv) To attempt to appraise the existing and potential sources of income for local governments.
v) To make policy-related recommendations based on the findings.

Moreover, the analytical tools required by the councilors, state house of assembly members, national economic planners and researchers would, be generated as numerical estimates from the study statistical analysis. Indeed, such estimated coefficients would provide government agents an informed basis for design and management of tax revenues for the betterment of taxpayers and those who settle at rural places. Besides, proper tax revenue management will act as stimulant in taxpayers and will encourage them pay their taxes regularly. In fact, it will increase the level of tax compliance even at the rural area given that people see evidence of good revenue management by the availability of infrastructure. This in turn will boost up the tax base [**3**].

Finally, the study forms a solid foundation for future studies in identifying some potential areas for further research to build up the pool of knowledge about the impact of proper tax revenue management at the grass root level.

Keynesian income determinant theory forms the theoretical foundation of this study.
According to Keynesian theory, growth in government expenditures leads to growth in general economy that is government expenditure is largely governed or controlled by government revenue or taxation. As the economy and hence income grows, tax revenue would rise thereby enabling government expenditure to rise in line with gross national product.

MATERIALS AND METHODS

Data sources and limitations

The main limitation in the study is the inaccuracy of Nigerian data. For instance, the statistical bulletin of the current year may carry adjustments done to previous year's data. This invariably indicates that the data used may not be error free in its entirety. Therefore, we assume that the previous year's data are more accurate than the current year's data because of possible error discoveries and corrections.

Choice of functional form

More importantly, the relationship for the variables as well as their estimated parameters has been established by means of ordinary least squares (OLS) method used in establishing the extent to which economic growth (GDP) explains variations in tax revenue allocation to the local government council vis-à-vis tax revenue buoyancy and stability since Time Series Data (1980 – 2002) are used. The relationship between the dependent variables and independent variables is assumed linear and this informs our use of regression analysis in the study. The validity of the estimated parameters would be based on known accounting and economic theories, and statistical and econometrics interpretations of regression results. The interpretations would specifically relate to the signs and magnitudes of the parameter estimates. The statistical tests: t-values, standard error tests, and f-test were employed to check for statistical significance of the parameter estimates.

The estimates were obtained by means of computer software package and were analyzed in terms of t-value, f-values, R-squares (adjusted), and D-W statistics. In other words, these statistical tools were used in examining

whether the exogenous variables explain well the variation in the endogenous variable, economic growth, in all the models. Descriptive analysis has also been employed where necessary.

However, because of the various casual factors in the model, it seems more appropriate to use the log-linear form of estimation. The log-linear captures the important fact that various casual factors in the model interact together to influence the dependent variables. Another advantage is that its estimation yields elasticity directly, thereby facilitating comparison of the relative impacts of variables.

The coefficient of determination (R^2) measures the extent to which the variation in the dependent variable is caused by changes in the explanatory variables, and f-ratio also indicates the level of reliability of the R^2 using the econometrics test. The Durbin Watson (DW) statistics was used in judging the evidence of serial correlation among the variables.

Given the exceeding complex, dynamic and unstable conditions, which the Nigerian local government areas are naturally prone, many unknown factors can exert certain influence on the magnitudes of those estimated variables. To capture those unpredicted influences, a stochastic variable is introduced in each of the functions.

To enable us articulate precisely and quantify these effects, some kinds of model, based on the theoretical foundations, were constructed and properly integrated with some indigenous variables to reflect the peculiarity of Nigerian local government councils.

Assumptions for the model

The following assumptions were made to facilitate the formulation and analysis of the model. We assume that:
1) The variables with which the model is defined are the most important variables; other influences are absorbed by the stochastic error term. In addition, the numerical values of these variables are not distorted.
2) The relationships are correctly identified and the specified models are suitable for the analysis of Nigerian fiscal policy performance at local government level.
3) That rapidly growing tax revenue is needed to match highly elastic local government current and capital expenditures.

Definition of key variables

In line with the focus of this study, certain key factors have been identified. These include the following:
(a) Economic growth indicator gross domestic product at market prices (GDP), and;
(b) Local Government Revenue Structure (explanatory) variables:
i) Tax Revenue Allocation from Federal Government (FAREV),
ii) Tax Revenue Allocation from State Government (SAREV)
iii) Internally Generated Tax Revenue (INTREV)
(c) Total Federal Government Tax Revenue (FTREV)

Specification of the model

Based on the reviewed literature, we have specified the relationship of the economic growth at grass root level with the local government tax revenue structure in one model and tax revenue structure buoyancy at the local government with respect to GDP in three models. The relationships are as follows:
i) Gross Domestic Product = F (total federal government tax revenue, total tax revenue received from federal government, total tax revenue received from state government, internally generated tax revenue),
ii)Tax Revenue Allocation Buoyancy = F (Economic Growth [GDP]), and
Formally, the function considering gross domestic product could be written in log-linear form as:

$$LnGDP1 = \beta o + \beta 1 LnFTREV1 + \beta 2 LnFAREV1 + \beta LnSAREV1 + \beta 4 LnINTREV + U1t \ldots\ldots\ldots\ldots\ldots (1)$$

The function considering Tax Revenue Allocation Buoyancy of the Local Government with respect to GDP could be written in log-linear form as:

$$LnFAREV_1 = a_o + a1LnGDP_1 + U_{21} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (2)$$

$$LnSAREV_1 = b_o + b_1LnGDP_1 + U_{31} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3)$$

$$LnINTREV_1 = C_o + C_1LnGDP_1 + U_{4t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

Where;
LnGDPt = log form of gross domestic product from year t
LnFTREV1 = log form of total federal government tax revenue from year t
LnFAREVt = log form of revenue allocation from federal government from year t,
LnSAREVt = log form of revenue allocation from state government from year t
LnINTREVt = log form of internally generated revenue from year t.
Ui are the stochastic error terms,
β_i are constant parameters in equation 1
a_i are constant parameters in equation 2,
b_i are constant parameters in equation 3,
c_i are constant parameters in equation 4

The parameters are expected to have the following signs:
$\beta_i, \beta_2, \beta_3, \beta_4 > 0$: the higher the amount of revenue received, the higher the GDP and hence the higher the level of economic growth at the grass root
$a_1 > 0$: The higher the GDP, the higher the amount of federally allocated tax revenue, hence the higher the level of tax revenue buoyancy.
$b_1 > 0$: The higher the GDP, the higher the amount of state allocated tax revenue, hence the higher the level of tax revenue buoyancy.
$c_1 > 0$: The higher the GDP, the higher the amount of internally allocated tax revenue, hence the higher the level of tax revenue buoyancy.

The function considering the total tax revenue accruing to the Local Government council could be written in a linear form as:

$$TOTREV_t = FAREVt + SAREVt + INTREVt$$

Where: $TOTREV_t$ = the linear form of total tax revenue to the Local government from year t.
The function considering the stability (Dynamics) of tax revenue structure of the Local Government Council could be written in ratio form:

$$SATT = \frac{SAREV_t}{TOTREV_t}$$

$$FATT = \frac{FAREV_t}{TOTREV_t}$$

$$INTT = \frac{INTREV_t}{TOTREV_t}$$

Where:
SATT = State Statutory Tax Revenue to the Local Government Council.
FATT = Federal Statutory Tax Revenue to the Local Government Council.
INTT = Internally Statutory Tax Revenue to the Local Government Council.

The estimates of the structural parameters of the stability (dynamics) of tax revenue structure in the Local Government Council will be obtained by solving separately using Uni-variate statistics.

The expected signs of all the parameters are positive. This indicates that increase in any of the explanatory variables in equation 1 would lead to increase in the value of gross domestic product. The same is applicable to federal tax revenue allocation, state tax revenue allocation and internally generated tax revenue models with respect to GDP, which would lead to increase in tax revenue buoyancy. These, of course, are our a priori expectations in the study. The estimates of the structural parameters will be obtained by solving the equation separately, using econometric method of ordinary least squares.

As aforementioned, in equation 1 local government revenue is expected to stimulate economic growth. We therefore expect that as the level of local government revenue increases the value of gross domestic product should increase and hence the level of entire economy at the grass roots. Also in equations 2 to 4, as the economy (GDP)

grows the revenue productivity of taxes or the growth potential of the various sources of tax revenue to the local government council should increase.

Analytical procedures

In this study, time series data were analyzed. Multiple and simple regressions of ordinary least squares were used in establishing the extent, to which the revenue received in the municipal council explains variations in the economic growth, measured by gross domestic product for the period 1980 to 2002 and the extent to which economic growth (GDP) explains variations in tax revenue allocation to the local government council vis-à-vis tax revenue buoyancy and stability.

The data used in the analysis are presented in Appendix 1(CBN statistical Bulletin vol. 12, 2002). As earlier mentioned these data were extracted from the secondary source.

Table 1: Relationship of revenue with economic growth variable GDP

Variable	Estimated Coefficient	Standard Error	t-statistics	p-value
Constant	10.1656	0.154624	65.7437	0.000
LnFTREV	0.110617	0.040141	2.75571	0.013
LnFAREV	0.004608	0.36503	0.126238	0.901
LnSAREV	0.016676	0.043159	0.386380	0.704
LnINTREV	-0.014969	0.033526	-0.446489	0.661

Equation 1: Estimated coefficients of revenue variables as related to economic growth indicator (GDP)

$$LnGDP = 10.1656 + 0.1106LnFTREV + 0.0046LnFAREV + 0.0167LnSAREV – 0.0149LnINTREV$$

$$R^2 = 87.66\%, \underline{R}^2 = 84.91\%, F(4, 18) = 31.95, \text{D-W stat} = 1.07892$$

Equation 1 of Table 1 shows the regression result of the relationship between amount of revenue received by the local government and economic growth proxy by gross domestic product. The model evaluates the effects, which total federal government tax revenue, tax revenue allocation from federal government, state government, as well as internally generated revenue have on the level of economic growth. In this model, the resultant coefficient that captures the autonomous status of GDP is 10.17. This is a positive intercept in the equation. This is independent of the variation in the explanatory variables in the model. This constant suggests that whether the magnitude of the estimated parameter (explanatory variables) changes or not, the GDP status would revolve around this autonomous level. The coefficient is significant at 5 percent level.

The result further discloses existence of a linear relationship between the variables (dependent and independent). In specific terms, the sign of the estimated coefficient of total federal government tax revenue (FTREV) in equation 1 is positive. This indicates that an in increase for revenue would lead to increase in the level of economic growth at the national level. The magnitude of the estimate shows that a 10% increase for revenue would lead to 1.1% increase in GDP ceteris paribus. The coefficient is statistically significant at 5% level because calculated t-statistic of 2.75 is greater than tabular t-statistic of 1.734 with 18 degrees of freedom. In addition, the sign of federal tax revenue allocation to the local government (FAREV) in equation 1, being positive, indicates that increase for revenue allocated to the local government would lead to increase in the level of economic growth right from the grass root. The magnitude of the estimates shows that 10 percent increase for revenue, allocated by the federal government to the local government, would lead to 0.04 percent increase in gross domestic product, ceteris paribus. This sign is consistent with our a priori expectation. The coefficient is statistically insignificant at 5 percent level because calculated t-statistic of 0.126 is less than tabular t-statistic of 1.734 with 18 degrees of freedom.

The estimated coefficient of revenue allocation from state (SAREV) also indicates existence of a positive linear relationship with GDP. The result gives impression that if the revenue from state government were increased by 10 percent, the general economy would increase by 0.16 percent, other factors held constant. The estimate is also insignificant at 5 percent level because calculated t-statistic of 0.386 is less than tabulated t-statistic of 1.734 with 18 degrees of freedom. Of course, the sign is consistent with our theoretical expectation.

The estimated parameter of internally generated revenue (INTREV) relates indirectly with the gross domestic product, the sign being negative. The result shows that all things being equal, a unit increase in internally generated revenue would cause the level of general economy to decrease by 0.0149 percent. The sign of the coefficient is not consistent with our a priori expectation. However, the estimate is not statistically significant even at conventional 10 percent level. This suggests that internally generated revenue make a negative contribution to the growth of the economy. This would suggest that internally generated tax revenue is rather too small or not used for the intended purpose of economic growth and development or there exist the dwindling (shortage) in the remittance of internally generated revenue.

The adjusted coefficient of determination from the result indicates that 84.91 percent variation in the dependent variable (GDP) is explained by the explanatory variables used in the model. This confirms that the model fits the data and that it explains well the variation in gross domestic product. The remaining 15.09 percent are captured by other factors that are not included in the model but rather represented by stochastic error term. The calculated F-ratio of31.95 is greater than the table F-value of 2.93 at 5 percent level of significance, shows that the overall regression is significant.

However, Durbin-Watson statistic of 1.0789 falls into inclusive region and this means that we cannot conclude an existence or non-existence of auto-correlation among the explanatory variables. Notwithstanding, it serves in analyzing the past revenue performance in terms of contribution to the economic well being of the society.

ii. *Tax revenue buoyancy as related to economic growth (GDP)*

Table 2: Revenue from federal government allocation

Variable	Estimated Coefficient	Standard Error	t-statistics	p-value
Constant	-4.4995	0.712201	-6.31775	0.000
LnGDP	1.04665	0.54355	19.2559	0.000

Equation 2: Tax revenue buoyancy with respect to (GDP)

LnFAREVt = -4.4995 + 1.0467LnGDP
R^2 = 94.64%, $\underline{R}^2$= 94.38%, F (1, 21) = 370.79, D-W stat = 0.794591

Equation 2 of Table 2 presents the regression result of the relationship of federal government tax revenue allocation with economic growth (GDP). The model evaluates the contribution of economic growth on federally allocated tax revenue at the grass root level. In the equation, the constant coefficient, which indicates autonomous (GDP) status, is -4.4995. This constant is independent of changes in other explanatory variables. It is a negative intercept in the model. It gives impression that where the magnitude of the coefficient of the explanatory variable changes or remains constant, GDP status would revolve around this autonomous level of the coefficient and it is not statistically significant at 5 percent and 10 percent level.

The estimated coefficient of the explanatory variable indicates an existence of a positive linear relationship between independent and dependent variables. Specifically, the magnitude of (GDP), which is 1.04665, gives impression that, ceteris paribus, a unit increase in (GDP) would cause 1.04665 percent increase in federally allocated tax revenue. This invariably means that as the economy grows revenue allocated from federal government increases. The sign of the estimated parameter is consistent with our postulate, and the coefficient is statistically significant at 10 percent and 5 percent level with 21 degrees of freedom, because calculated t-statistic of 19.2559 is greater than tabulated t-statistic of 1.323 and 1.721 respectively.

The coefficient of determination from the result shows that 94.64 percent variation in revenue received from the federal government (FAREV) is explained by the explanatory variable (GDP) used in the model. This confirms that the model fits the data and that it explains well the variation in FAREV. The remaining 5.36 percent if captured by stochastic error term. This indicates a high level of association between federal government tax revenue allocation to the local government and economic growth. The calculated F-ratio of 370.79 being greater than the table F-value of 4.32 at 5 percent level confirms that the data fit the model.

However, the D-W statistic of 0.795 indicates existence of auto-correlation. This implies that the result could not be used in forecasting future performance of GDP in relation with revenue.

Table 3: Revenue from state government allocation

Variable	Estimated Coefficient	Standard Error	t-statistics	p-value
Constant	0.639827	1.00817	0.634644	0.533
LnGDP	0.473436	0.076943	6.15307	0.000

Equation 3: Tax revenue buoyancy with respect to (GDP)

LnSAREVt = 0.6398 + 0. 4734LnGDP
R^2 = 64.32%, $\underline{R}^2$= 62.62%, F (1, 21) = 37.86, D-W stat = 0.404139

Equation 3 of Table 3 presents the regression result of the relationship of tax revenue allocation from the state, with economic growth (GDP). The model evaluates the contribution of economic growth on state allocated tax revenue at the grass root level. In the equation, the constant coefficient, which indicates autonomous (GDP) status, is 0.6398. This constant is independent of changes in other explanatory variables. It is a positive intercept in the model. It gives impression that where the magnitude of the coefficient of the explanatory variable changes or remains constant, GDP status would revolve around this autonomous level of the coefficient and it is not statistically significant at 5 percent and 10 percent level.

The estimated coefficient of the explanatory variable indicates an existence of a positive linear relationship between independent and dependent variable. Specifically, the magnitude of (GDP), which is 0.4734 gives impression that, ceteris paribus, a unit increase in (GDP), would cause 0.4734 percent increase in state allocated tax revenue. This invariably means that as the economy grows revenue allocation from state government increases. The sign of the estimated parameter is consistent with our postulate, and the coefficient is statistically significant at 10 percent and 5 percent level with 21 degrees of freedom, because calculated t-statistic of 6.153 is greater than tabulated t-statistic of 1.323 and 1.721 respectively.

The coefficient of determination from the result shows that 64.32 percent variation in revenue received from the state government (SAREV) is explained by the explanatory variable (GDP) used in the model. This confirms that the model fits the data and that it explains well the variation in SAREV. The remaining 35.68 percent are captured by stochastic error term. This calculated F-ratio of 37.86 being greater than the table F-value of 4.32 at 5 percent level confirms that the data fit the model.

However, the D-W statistic of 0.40414 falls into a rejection region; this means that there exists an auto-correlation among the explanatory variables. Therefore, the estimated result cannot be used for forecasting because of inappropriate correlation among the independent variable. However, it is useful in analyzing the past performance of the state revenue allocation in relation to economic growth at grass root level.

Table 4: Internally generated revenue in the Local Government

Variable	Estimated Coefficient	Standard Error	t-statistics	p-value
Constant	-52.7415	12.0277	-4.38501	0.000
LnGDP	5.30294	1.05372	5.0250	0.000

Equation 4: Tax revenue buoyancy with respect to (GDP)

LnINTREVt = -52.7415 + 5.30294LnGDP
R^2 = 54.67%, $\underline{R}^2$= 52.51%, F (1, 21) = 25.3261, D-W stat = 0.43818

Equation 4 of Table 4 presents the regression result of the relationship of internally generated tax revenue, with economic growth (GDP). The model evaluates the contribution of economic growth on internally generated tax revenue at the grass root level. In the equation, the constant coefficient, which indicates autonomous (GDP) status, is -52.7415. This constant is independent of changes in other explanatory variables. It is a negative intercept in the model. It gives impression that where the magnitude of the coefficient of the explanatory variable changes or

remains constant, GDP status would revolve around this autonomous level of the coefficient and it is not statistically significant at 5 percent and 10 percent level.

The estimated coefficient of the explanatory variable indicates an existence of a positive linear relationship between independent and dependent variable. Specifically, the magnitude of (GDP), which is 5.3029, gives impression that, ceteris paribus, a unit increase in (GDP) would cause 5.3029 percent increase in internally generated tax revenue. This invariably means that as the economy grows revenue generated internally in the local government increases. The sign of the estimated parameter is consistent with our postulate, and the coefficient is statistically significant at 10 percent and 5 percent level with 21 degrees of freedom, because calculated t-statistic of 5.025 is greater than tabulated t-statistic of 1.323 and 1.721 respectively.

The coefficient of determination from the result shows that 54.67 percent variation in revenue generated at the local government (INTREV) is explained by the explanatory variable (GDP) used in the model. This confirms that the model fits the data and that it explains well the variation in INTREV. The remaining 45.33 percent are captured by stochastic error term. This indicates an average level of association between internally generated tax revenue in the local government and economic growth. The calculated F-ratio of 25.3261 being greater than the table F-value of 4.32 at 5 per cent level confirms that the data fit the model.

However, the D-W statistic of 0.43818 falls into a rejection region; this means that there exists an auto-correction among the explanatory variables. Therefore, the estimated result cannot be used for forecasting because of inappropriate correlation among the independent variable. However, it is useful, in analysis of the past performance of the internally generated revenue in relation to economic growth at grass root level.

Summary of regression result and test of hypotheses

The regression results

The empirical results are presented in four separate models. The first model deals with the postulated relationship between revenue and economic growth measured by gross domestic product at the market price. The second relates tax revenue buoyancy of federal government allocation with GDP (Economic Growth); and the third model relates tax revenue buoyancy of state government allocation with GDP (Economic Growth); the fourth model related tax revenue buoyancy of internally generated revenue with GDP (Economic Growth).

In equation 1, we regressed Total Federal Government Tax Revenue, Federal Government Tax Revenue Allocation, State Government Tax Revenue Allocation and Internally Generated Tax Revenue on GDP of Nigeria. The result shows that the constant term is positive and in line with a priori expectation.

This constant suggest that whether the magnitude of the estimated parameter (explanatory variable) changes or not, the GDP status will have a constant growth rate of 10.1656 accounted for by the stochastic error term ceteris paribus.

The coefficients of federal government tax revenue allocation, state government tax revenue allocations are positive. This shows that an increase in these revenues will exert positive effect on the GDP in Nigeria. The coefficient of internally generated tax revenue reported negative on GDP; this is in line with the regressive tax hypothesis. Precisely the result shows that if the entire explanatory variable specified in equation 1, is held constant, any 1% increase in internally generated revenue will result to 0.14969 percent decline in the GDP of Nigeria. This could be explained by the fact that most of the internally generated revenue is not effectively, directed towards productive/economic means in equation 1, Federal government Revenue generated is an important variable influencing economic growth in Nigeria.

Federal and State Government tax revenue allocation also exert positive impact on economic growth but such effect is not significant. This might be due to the inefficiency associated with this revenue generation towards production and acquisition of means of and objects of production.

The adjusted coefficient of multiple determinations of 0.849121 shows that the regression model captures more than 84% of the total variation in GDP due to variation in the explanatory variable, with less than 16 percent accounted for by the stochastic error term.

The joint test of significance of all the parameter estimated (F-statistics) shows that the observed F* ratio is 31.953, and is greater than the theoretical value of 2.93 at 5% level of significance, hence we conclude that our estimated result in equation 1, is 95% reliable.

The Durbin – Watson (D.W) statistics shows that our test for serial correlation is trapped in an empirical snarl and as such, we cannot establish clearly whether there is serial correlation or not.

i Tax revenue structure buoyancy

Investigating into the buoyancy of the tax revenue structure on GDP, we regressed GDP on Federal Government Tax Revenue Allocation, State Government Revenue Allocation and internally generated revenue. These results are presented in equations 2 to 4.

a) Tax revenue structure buoyancy with respect to GDP

As indicated in equations 2 to 4 the GDP has recorded flexibility or buoyancy coefficient of 1.04665, 0.473436, and 5.30287 induced by Federal Government Revenue Allocation, State Government Revenue Allocation and Internally Generated Revenue respectively.

Precisely, the findings show that high degree of flexibility (buoyancy) were accorded with internally generated revenue followed by federal Government Revenue Allocation and inflexibility in the case of State Government Revenue Allocation. In other words, the regression result shows that the degree of responsiveness of Federal Government Revenue allocation and internally generated revenue due to variations in gross domestic product (economic growth) are elastic. This shows that internally generated tax revenue has the ability to respond faster to GDP than with the case of Federal Generated Tax Revenue.

The degree of responsiveness of state government tax revenue allocation with respect to GDP is sluggish (inelastic). From the result, it is clear that economic growth would have more profound effect (increase) on internally generated tax revenue and federally generated tax revenue, than it would on state generated tax revenue.

ii. Stability (dynamics) of tax revenue allocation/generation at the local government council

We observed appendix 2 that from 1980 – 1989; Federal Government Tax Revenue Allocation to the Local Government was relatively stable than internally generated revenue and state revenue allocation in that order. The most unstable was that from the state government.

Between 1990 – 1994, revenue allocation from the state government was relatively stable than that of the internally generated revenue and federal government allocation in that order. This is also true for the period from 1995 – 2002. Based on the above result state allocation and internally generated revenue can be used for long term planning than federal government revenue allocation.

Research hypotheses

The following hypotheses were tested in the study;

i) There is a significant relationship between local government tax revenue variables (structure) and general economic growth measured by gross domestic product (GDP).

ii) There is a significant statistical relationship between general economic growth measured by gross domestic product (GDP) at the local government and federally allocated tax revenue.

iii) There is a significant statistical relationship between general economic growth measured by gross domestic product (GDP) at the local government and state allocated tax revenue.

iv) There is a significant statistical relationship between general economic growth measured by gross domestic product (GDP) at the local government and internally generated tax revenue.

a) Test of hypothesis I

We wish to use F-statistic and formally test the null hypothesis.

H_o; $\beta_1 = \beta_2 = \beta_3 = \beta_1 = 0$, against the alternative hypothesis,

H_1; $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq 0$

H_o means that there is no significant regression relationship between the dependent variable, economic growth, and the three independent variables, revenue from federal government, revenue from state government, and internally generated revenue in equation 1 of Table 1.

H_1, on the other hand, means that there is a significant regression relationship between the dependent variable, economic growth, and the four independent variables, federal government total tax revenue, revenue allocation from federal government, revenue allocation from state government, and internally generated revenue in equation 1 of Table 2.

Using F-statistic to test the overall significance of the regression coefficients in the multiple regression model, F* (4, 18) and $F_{0.05}$, tabular F. Since F* (4, 18) is greater than $F_{0.05}$ from the F-table, that is, 31.95 > 2.93, we reject the null hypothesis that the relationship is not significant. Hence, we conclude that H_1 holds. Therefore, the 84.91% variation in gross domestic product is caused by variation in revenue variables.

b)Test of hypothesis 2
In this section we test the null hypothesis H_o; a1 = 0, against alternative hypothesis H_1; $a_1 \neq 0$

H_o means that a1 is not statistically significant and that there is no positive linear relationship between the level of economic growth (GDP) and federal government tax revenue allocation to the local government council (Calabar Municipality) in equation 2 of Table 2.

H_1 means that a1 is statistically significant and that there is a positive linear relationship between the level of economic growth (GDP) and federal government tax revenue allocation to the local government council (Calabar Municipality) in equation 2 of Table 2. Using t-statistic to test the regression coefficient of Economic Growth (GDP), t* = 19.2559 and $t_{0.05}$ = 1.721. since t* is greater than $t_{0.05}$, that is, 19.2559 > 1.721 with 21 d. f. at 5% level, we conclude that a_1 is statistically significant, therefore the alternative hypothesis (H_1) holds while we reject the null (H_o),

c) Test of hypothesis 3
In this section we test the null hypothesis H_o; $\beta_1 = 0$ against alternative hypothesis H_1; $\beta_1 \neq 0$

H_o means that β_1 is not statistically significant and that there is no positive linear relationship between state government tax revenue allocation to the local government and economic growth within the local government area.

H_1 means that b1 is statistically significant and that there is a positive linear relationship between state government tax revenue allocation to the local government and the level of economic growth.

Using t-statistic to test the regression coefficient of GPD, equation 3 of Table 3, t* = 6.153 and $t_{0.05}$ = 1.721. since t* is greater than $t_{0.05}$, that is, 6.153 > 1.721 with 21 d. f. at 5% level, we conclude that β_1 is statistically significant, therefore the alternative hypothesis (H_1) is accepted while we reject the null (H_o).

d) Test of hypothesis 4
In this section we test the null hypothesis H_o; $C_1 = 0$ against alternative hypothesis H_1; $C_1 \neq 0$

H_o means that C1 is not statistically significant and that there is no positive linear relationship between internally generated tax revenue in the local government council and economic growth.

H_1 means that C_1 is statistically significant and that there is a positive linear relationship between internally generated tax revenue in the local government council and economic growth.

Using t-statistic to test the regression coefficient of GDP, equation 4 of Table 4, t* = 5.025 and $t_{0.05}$ – 1.721. Since t* is greater than $t_{0.05}$, that is, 5.925> 1.721 with 21 d. f. at 5% level, we conclude that C_1 is statistically significant, therefore the alternative hypothesis (H_1) is accepted while we reject the null (H_o).

Summary, conclusion and recommendations
Summary of findings
Our findings showed that the economic well being of those in the local government areas is enhanced by the value for revenue received by the local council. The following is the summary of the major findings of the study.

(1) The regression results disclose that revenue from federal government and state government has significant effects on economic growth. Whilst internally generated revenue has a negative effect on economic growth; this could be explained by the fact that internally generated revenue is minimal compared to other allocations or that internally generated revenue is not effectively directed towards productive and economic means.
(2) The federal government total revenue is an important variable influencing economic growth in Nigeria. Federal and state government tax revenue allocation to the local government also exerts positive impact on economic growth, but such effect is not significant. This might be due to the inefficiency associated with the revenue generation.
(3) The findings show that high degrees of flexibility (buoyancy) were accorded with internally generated revenue followed by federal government revenue allocation and inflexibility in the case of state government revenue allocation. In other words the regression result shows that the degree of responsiveness of internally generated tax revenue and federal government revenue allocation due to economic growth are elastic. The degree of responsiveness of state government tax revenue allocation with respect to economic growth inelastic.
(4) The result above is clear that economic growth would have more profound effect (increase) or internally generated tax revenue and federally allocated tax revenue, than it would on state allocated tax revenue.
(5) Comparatively, the stability (dynamics) of revenue allocation to the local government council shows that between 1980-89; federal tax revenue allocation was relatively stable than internally generated revenue and state allocated tax revenue in that order. Between 1990-94, revenue allocation from the state government was relatively stable than that of internally generated tax revenue and federal allocation in that order. This is also true for the period from 1994-2002. Based on this result; state allocation and internally generated tax revenue can be used for long term planning than federal government revenue allocation.
(6) The percentage increase of internally generated revenue has declined significantly over the years under study.
(7) We also discovered that local government relies heavily on federal allocation instead of mobilizing and generating within their councils.

Based on the evidence presented and analyzed, the economy at the grass root level changes as the value of revenue received changes. This implies that revenue received in a local government area has a strong influence on the economic growth process in the local government. In other words, the general economic activity in the local government area is stimulated by the amount of public expenditure. Of course, the amount of revenue collected in the fiscal year enhances the public expenditure.

CONCLUSION

In this study, we have evaluated empirically a simple model of the links between local government revenue and economic growth from the grass root level. The major finding is that revenue received by the local government has stimulated the economy and caused a noticeable growth at the grass root level.

The major policy conclusion is that federal and state government should avoid a policy which would cause a decline for revenue allocated to local government, as this would lead to a decline in economy at the rural areas. This is necessary given that federal allocation makes a significant contribution to growth in infrastructure and hence the entire economy. Although the internally generated revenue has not made a significant contribution to infrastructural provisions in the local government areas, we recommended mobilization of more revenue at this level since internally generated revenue relates directly with infrastructural expenditure

Policy implications and recommendations
The implications of the findings of this study are that:
(1) The influence which the adequate revenue received by a local government wields on the economy is indicated by positive response of the total value of the local government expenditure.
(2) Federal government policy, which could cause a decline in revenue allocated to the local government, is the policy that retards economic growth at the grass root level, given that federal allocation contributed significantly to the economic growth of the rural communities.
(3) Fiscal policy that does not encourage revenue mobilization at the local government area causes a decline in economy, given that internally generated revenue related directly with economic growth indicators.
(4) The provision of social and economic infrastructure in rural areas would decline and hence the entire economy at that level if the federal government reduces the allocation given to the local councils. This is will happen since only federal revenue makes a significant contribution to the growth in the infrastructure.

Based on these and other policy implications of the study findings, the following policy recommendations are proffered, which if considered, would improve the economy right from the grass root level:

a. For the local economy to experience a steady growth there should be an accountability and optimum utilization of tax funds by government agencies right from the grass root level.

b. That federal and state government should discourage any fiscal policy that could cause a decline in revenue allocation to local government, as this would lead to a decline in gross domestic product, which measures the economy growth. This is necessary since federal and state allocated revenue directly relates with economic growth indicators.

c. That local government should mobilize more revenue within their domain in order to enhance the economy at the rural level. This invariably would enable more tax revenue to be raised since tax-base would be widened. Indeed, this seems appropriate given that gross domestic product which measures tax-base relates directly with internally generated revenue.

d. The formulation of deliberate policy that would reduce the rate of tax evasion in local government areas as this has a negative effect is reflected in the decline of the total local government expenditure and hence the level of economic growth.

e. That the enforceable laws should be made to punish individuals and organizations that falsify their accounting records in order to be under-assessed.

f. Adequate estate valuation should be done on property to determine reasonable tenement rate to be paid by the owner.

g. We recommend that local government should ensure that all agencies charged with the responsibility of collecting taxes and rates do that judiciously and that such revenue goes to the local council purse.

h. That public infrastructure like roads; pipe-borne water and school buildings at rural areas should be given attention. Of course, provision of these amenities would increase the level of tax compliance at rural areas.

i. Public awareness should be carried out by way of enlightening the masses on the need to pay tax. Taxation should not be viewed, as punitive measures from government but rather as a civil responsibility, which all the eligible adults are under the obligation, to carry out.

j. Tax officers should be given adequate training before they are saddled with responsibility of revenue tax collection, and that needed tools be given to them for carrying out this important assignment.

j. Finally, we recommend that adequate machinery should be put in place to ensure that collected tax goes to government accounts, adequate internal control system should be set up in local government councils in order to guard against any possible fraud.

REFERENCES

[1] Central Bank of Nigeria Bulletin, **1996**:72

[2] Uwatt, B.U. (**1999**), *Journal of Economics and Social Studies*, Vol. 41, No.2

[3] Wallschutzsky, I. (**1989**), Achieving Compliance in Developing Countries, Bulletin of International Bureau of Fiscal Documentation, May **1989**.

APPENDIX 1: Tax revenue structure and economic growth

	FREV	LFREV	CONS	LCONS
1980	12993.00000	9.47217	36746.00000	10.51178
1981	7511.60010	8.92420	41182.00000	10.62576
1982	5819.10010	8.66890	43100.00000	10.67128
1983	6272.00000	8.74385	48946.00000	10.79847
1984	7267.20000	8.89113	54881.00000	10.91292
1985	10001.00000	9.21044	61408.00000	11.02530
1986	7969.39990	8.94336	63691.00000	11.06180
1987	16129.00000	9.68837	85723.00000	11.35888
1988	15588.59961	9.65429	122320.00000	11.71440
1989	25893.59961	10.16175	148904.00000	11.91106
1990	38152.10156	10.54934	166742.59375	12.02421
1991	30829.19922	10.33622	234958.90625	12.36717
1992	53264.89844	10.88303	424613.90625	12.95894
1993	53493.60156	10.88732	597373.00000	13.30030
1994	90622.60156	11.41446	782570.00000	1357034
1995	249768.09375	12.42829	189848.00000	12.15398
1996	369267.00000	12.81927	2511050.00000	14.73621
1997	423215.00000	12.95564	2605890.00000	14.77328
1998	353724.00000	12.77627	2961340.00000	14.90115
1999	662585.00000	13.40390	2549440.00000	14.75138
2000	597282.12500	13.30015	2895656.00000	14.87872
2001	796976.68750	13.58858	3000000.00000	14.91412
2002	714454.18750	13.47969	3500000.00000	15.06827

	SAREV	FAREV	INTREV
1980	1072.30005	444.70001	268.10001
1981	901.59998	1268.09998	106.40000
1982	987.00000	1225.50000	84.00000
1983	493.50000	1185.09998	768.40002
1984	345.50000	1261.69995	900.90002
1985	128.39999	1576.59998	1492.40002
1986	154.10001	1341.09998	2402.30005
1987	231.10001	1676.40002	1598.50000
1988	323.50000	2514.60010	1831.09998
1989	420.60001	3771.89990	1944.00000
1990	630.90002	5657.79980	1791.19995
1991	458.29999	6978.79980	2149.39990
1992	503.29999	11890.79980	2643.80005
1993	905.90002	31097.50000	3436.89990
1994	1721.19995	29408.00000	4124.29980
1995	2151.50000	30348.90039	3401.69995
1996	2581.80005	28131.90039	3654.30005
1997	2366.69995	26412.50000	4750.60010
1998	1894.40002	39561.80078	7125.89990
1999	2280.60010	80020.29688	8573.50000
2000	2180.19995	161124.40625	18823.50000
2001	4142.39990	198035.50000	54083.19922
2002	5592.20020	211727.00000	27160.09961

	CONS	FREV	GDP	GDP1
1980	36746.00000	12993.00000	66186.60156	50848.60156
1981	41182.00000	7511.60010	70395.89844	50749.10156
1982	43100.00000	5819.10010	70157.20313	51709.19922
1983	48946.00000	6272.00000	66389.50000	57142.10156
1984	54881.00000	7267.20020	63005.39844	63608.10156
1985	61408.00000	10001.00000	68916.29688	72355.39844
1986	63691.00000	7969.39990	71075.89844	73061.89844
1987	85723.00000	16129.00000	70741.39844	108885.1016
1988	122320.00000	15588.59961	77752.50000	145243.2969
1989	148904.00000	25893.59961	83495020313	224796.9063
1990	166742.59375	38152.10156	90342.10156	260636.7031
1991	234958.90625	30829.19922	94614.10156	324010.00000
1992	424613.90625	53264.89844	97431.10156	549808.81250
1993	597373.00000	53493.60156	100015.20313	697090.00000
1994	782570.00000	90622.60156	101330.00000	914940.00000
1995	189848.00000	249768.09375	103510.00000	1977740.00000
1996	2511050.00000	369267.00000	107020.00000	2823900.00000
1997	2605890.00000	423215.00000	110400.00000	2339650.00000
1998	2961340.00000	353724.00000	113000.00000	2881310.00000
1999	2549440.00000	662585.00000	116000.00000	3352650.00000
2000	2895656.00000	597282.12500	120090.00000	4980943.00000
2001	3000000.00000	796976.68750	116363.29688	5639865.00000
2002	3500000.00000	714754.18750	117484.39844	4657819.00000

	TOTAL	FAT	SAT	INTT
1980	0.4912	0.60069	0.15019	1.00000
1981	0.55714	0.39612	0.046747	1.00000
1982	0.53364	0.42978	0.036577	1.00000
1983	0.48431	0.20168	0.31402	1.00000
1984	0.50305	0.13775	0.35920	1.00000
1985	0.49309	0.040158	0.46675	1.00000
1986	0.34409	0.039538	0.61637	1.00000
1987	0.47815	0.065916	0.45593	1.00000
1988	0.53855	0.069284.	0.39217	1.00000
1989	0.61467	0.068541	0.31679	1.00000
1990	0.70023	0.078083	0.22169	1.00000
1991	0.72798	0.047807	0.22421	1.00000
1992	0.79072	0.033469	0.17581	1.00000
1993	0.87746	0.025561	0.096977	1.00000
1994	0.83419	0.048824	0.11699	1.00000
1995	0.84532	0.059927	0.094749	1.00000
1996	0.81855	0.075122	0.10633	1.00000
1997	0.78773	0.070585	0.14168	1.00000
1998	0.81435	0.038974	0.14668	1.00000
1999	0.88056	0.025096	0.094345	1.00000
2000	0.88468	0.011971	0.10335	1.00000
2001	0.77279	0.016165	0.21105	1.00000
2002	0.86603	0.022874	0.11109	1.00000

Indicators Data: Local Government Revenue and Economic Growth.
Source: CBN Statistical Bulletin Vol. 12 December, 2002 Calabar Municipal Council Account Section

APPENDIX 2: Test for dynamics (stability) of tax revenue allocation to the Calabar Municipal Council

Period	Uni-variate statistics	
1980 – 1989		
Variables	Standard deviation	Variance
FAT	0.10692	0.011432
SAT	0.19975	0.039900
INTT	0.18805	0.035363
1990 – 1994		
FAT	0.073198	0.0053579
SAT	0.020078	0.00040313
INTT	0.058620	0.0034363
1995 – 2002		
FAT	0.039374	0.0015503
SAT	0.023728	0.00056301
NTT	0.037219	0.0013852