A Combinatorial and Synergistic Analysis of Some Selected Nigerian Taxes and Economic Growth

OLOIDI, Gabriel Adebayo

Department of Accountancy, Rufus Giwa Polytechnic, Owo, Ondo State, Nigeria

Abstract:

The current study focused on some selected Nigerian taxes and their contributions to economic growth. In order to achieve this objective, a dependent variable, to proxy economic growth, was identified as the gross domestic product (GDP). Four independent variables (tax bases), were value added tax,(VAT), company income tax, (CIT), petroleum profit tax,(PPT) and customs and excise (CEX) tax .A mathematical combination was applied on the independent variables resulting in 15 econometric models. Findings revealed that VAT and PPT were synergistically significant six (6) out of eight (8) possible times. The CIT was significant five (5) out of eight (8) times and the last and also the least was significant three (3) out of eight (8) times. The overall synergy was 59.34 percent.. Part of the recommendations were that government should reduce the 30 percent CIT to encourage investment and that an enduring strategy should be put in place to address the importation of some goods and services that are sabotaging the economy and also the consumption of some goods that were also detrimental to the health and well-being of the citizenry.

Keywords: Nigerian taxes, economic growth, combinatorial analysis, tax policy and administration, synergistic analysis.

JEL classification; E62, O45, O65.

1. Introduction

The importance of taxation cannot be over emphasized in a developing economy like Nigeria. It is always a relevant discourse whenever it comes to stage. It is however more relevant today, given the prevalence of tax evasion and the very poor state of social infrastructures in the country. There is also the need for the government to widen its non oil revenue base as the revenue from oil is dwindling fast. There is the ubiquitous presence of all kinds of charlatan and pretenders claiming to be "tax consultants" (Adekansola, 2007). We cannot afford to be indifferent and feel unconcerned. All hands of stake holders must be on deck to salvage the tax system from collapse.

Experts had described the Nigerian tax system as being weak, lopsided, and full of dyfunctionalities, poorly administered and lack statistical details among others. On statistical data, the Federal Board of Inland Revenue (FBIR) was not helping matters. The FBIR is not information friendly at all. Probably one would not release what is not available. Even in the face of limited information, Kanjanataratu and Suriya(2014) had advocated a logistic function, which one expected, would help in forecasting tax revenue and compare actual with estimates to assess performance and take necessary actions. Successive governments have admitted that tax productivity is low in Nigeria (Ariyo, 1997). The low productivity level was attributed to deficiencies in tax administration and collection system especially on the part of those outside the tax system net.(Ijewere, 1991). Corruption has singly been responsible for all the anomalies in the tax system.

Objectives of the Study

The objectives of this study would be the assessment of the effects of value added tax (VAT), Company income Tax (CIT), Petroleum profit tax (PPT), customs and excise taxes (CEX) on, and their contributions, to economic growth in Nigeria. Specifically, the study aims at:

i.   the application of combinatorial analysis on the taxes consisting VAT, CIT, PPT and CEX as tax bases, resulting in 15 econometric models;

ii.   the assessment of the behavior(s) of the independent variable(s) in each of the models and the neutrality of the four independent variables in the 15th model, focusing on the signs of the coefficients, the t-value, the adjusted R square (AR^2),the Durbin-Watson (d.w.) statistics and the F ratio;

iii.   carrying out a synergistic analysis of the cumulative significance of the independent variables to the GDP and the eventual ranking of the variables.

2. Review of Related Literature

2.1 Taxation

Taxation and tax are generally regarded as unpleasant subject especially in the conceptual view of taxpayers but have been compulsory since centuries. It has often been said that taxes are the price paid for civilization.

Taxes are the most important sources of government revenue. Government may secure a command over resources by borrowing and spending the proceeds, or by creating money. Government may also secure resources by profit from enterprises such as publicly owned electric power facilities or the sale of timber from public lands. Occasionally government may secure funds from reparation or from gifts but the major source of government revenue consist of taxes.

2.2 Tax Administration

Tax administration in Nigeria is characterized by corruption,, use of inexperienced and compromising tax officers, conniving with tax payers to relax enforcement of tax policies. Much revenue is lost due to the assistance of these mediocre collectors/consultants; who aided and abated tax evasion. The third tier of the government deflated the situation further by using poorly trained and unsupervised consultants. Many lacks clear understanding of the principles underlying their

responsibility to the extent of melting jungle justice on tax payers. The local government level is controlling more than 35 different tax bases. Tax list is long and confusing, assessment is rather naïve and whimsical. The enforcement is mainly by ambushing and terrorizing tax payers and even innocent members of the society. The state government is operating about 12 tax bases while the federal government settled at eight (8) tax bases. It was objectively the view of Adekansola (2007) that policy makers at all tiers of government must take a long term view of tax administration to enhance the economic development of the country.

2.3 Nigerian Tax Policy

A tax policy is a set of rules and guidance within the feasible application of a particular tax system. A good tax policy should not and must not be a policy package with disincentives, with making apathy as the premium of taxpayers, terrorizing the struggling entrepreneurs and growing into a carnivore to devour political opponents and null the hope of would be job creating ventures. Rather, it should aim at fostering economic growth, investment in new capital (both human and physical), encourage implementation of new production techniques and new products.

The Federal government sets up a presidential committee on national tax policy (FGN, 2003) and describes the national tax policy as providing a set of rules, modus operandi and guidance to which all stake holders in the tax system must subscribe. It should provide a stated point of reference for all stake holders in the country and upon which they can be held responsible. The successful application of tax policy in Nigeria is another area of concern. Tax policy is always subjected to pressure and changes which in most cases do not guarantee outcome that are in line with overall goal (James and Nobles, 2008). A case readily in mind was the opposition and serious pressure which the policy to raise VAT rate from 5 percent to 10 percent in a fiscal year faced from a formidable opposition such as the organized private sector. VAT rate was raised to 10 percent in 2007 but was later subsided to the initial rate of 5 percent. There is the

likelihood that VAT has been raised from 5% to 10% in the second quarter of the year 2015.

The Nigerian tax system needs a reform. Many of the tax laws are overdue and some rather obsolete; and needs to be updated. A strengths and weaknesses; opportunities and threats (SWOT) analysis is deserved so that the unproductive sub-systems are amended to reflect norms and align with the current day realities. A good example is the stamp duties laws. Remove apathy conception from tax payer and provide the social amenities expected from tax payers. Corruption is a serious hindrance to the achievement of tax goals. This is not limited to tax system and administration but already a monster that has pervaded the veins and nerves of the society. Any wonder then that Suriya and Pruekruedee (2014) say that corruption is the root of all evil. One is still watching with keen interest Buhari's administration's zero tolerance to corruption. The monster has refused various treatments and other prescribed medicine to heal it. It is believed it is not in-surmountable even if it would need revolutionary antidote.

2.4 Tax System

A tax system is made up of tax bases upon which the tax policy, the tax law and tax administration operate. When they work together, the tax system will be able to achieve its objective of generating revenue. The government has neglected the tax system and had been busy on sharing proceeds from crude oil instead of standardizing the tax system in the country. We are not tapping the huge reserves from other productive sector of the economy. The Nigerian tax administration and practice must fulfill the following characteristics.

i   raising enough revenue optimally and be collection cost conscious and minimize avoidable losses;

ii.   avoiding excessive public sector borrowing resulting in deficit financing to meet essential expenditures.

iii.   raising the revenue in ways that are equitable and minimized its disincentive effects on the economic activities,

iv.   subject to the reasonability of the consideration of the local environment, administration should not deviate substantially from international norms.

When Audu (2012) considered the dis-incentive factor in the tax system, he suggested a focus on indirect taxation like value added tax (VAT) which is very much under- collected.

2.5 Taxation and Economic Growth

Economic growth is the change in potential output of the economy shown by a shift to the right of the production possibility frontier. It is usually measured by the change in real national income (GDP). This change is as a result of increases in the quantity and quality of land, labor and capital and by technological progress. This is an increase in production capacity. Jones (1997) explained economic growth as a sustained increase in the productive capacity of an economy. It underlies the rise in the standard of living that has characterized most of the world over the last two centuries. A measure of the average standard of living per person, the GDP is compared with total population of a country and the output per person can be calculated. In Nigeria, the GDP at current purchasing prices (GDP at basic prices + indirect tax – subsidies) in 2011 was ₦38151000M while the population as at same time was 168M (CBN Statistical Bulletin, 2011; CBN Annual report, 2011) the standard of living (or per capital income) therefore would be 38,151,000M/168M resulting in ₦2,227,100. With the dollar to naira exchange rate of 152:1 in 2011, an average Nigerian earns $1494. One serious blemish of economic growth in most African country was the skewness in distribution of GDP where active productive capacities are concentrated within some few sectors. A dependable GDP would be a product of co-integrated sectored performances as to evolve a GDP that exhibit a probability density function that is symmetrical around the mean. Such normally distributed GDP is a true representation of economic

performances. A sustained rise in GDP where every sector of the economy contributes, at least proportionally, could be referred to as economic development. This is why economic growth has been used synonymously with economic development. Economic performance evaluates GDP at what it is and what it should be. Economic growth maybe experienced but not at attainable or optimal rates, given a designed productive capacity input or resources available. It is only if resources are efficiently used to full advantage can an economy perform optimally. When $(GDP_t - GDP_{t-1})/(GDP_{t-1}) > 0$, there is growth. The current year GDP is higher than the previous year GDP, otherwise, there is negative economic growth (depression or recession). Economic growth may fluctuate and still maintain a rise in the trended view. If the current local minimal is always above the previous local minima, the economy is characterized as growing.

Taxation is an important component in economic growth. The GDP is a proxy of the National Income. Tax contributes significantly to federal collected revenue by aggregating oil and non-oil revenues. The percentage of the Federal collected revenue to the GDP from1994-2011 is presented in Table 1.

Table 1: Percentage of oil and non-oil revenues to GDP 1994 – 2011. Also the Respective Taxes [VAT, PPT, CEX, and CIT] 1994-2013.

Year	GDP at cpp	₦'M Oil Rev	₦'M Non-oil Rev	₦'M Total	Percentage on GDPcpp*	VAT	PPT	CEX	CIT
1994	946	160	42	202	21.4	7.3	43	18.3	12.3
1995	2009	325	135	456	22.7	20.8	43	57.4	21.8
1996	2799	409	115	524	18.7	31	76.7	55	22
1997	2907	417	166	583	20	34	68.6	63	26
1998	2816	324	139	464	16.5	37	68	58	33
1999	3312	724	225	949	28.7	47	164	88	46

2000	4717	1592	314	1906	40.4	58.5	525	101.5	51
2001	4910	1708	903	2231	45.4	91.8	639	171	69
2002	7128	1231	501	1732	24	108.6	392	181.4	89
2003	8743	2074	501	2575	29.5	136.4	683	196	115
2004	11674	3355	566	3921	33.6	159.5	1183	217	113
2005	14735	4762	785	5547	37.6	178.1	1905	233	140
2006	18710	5288	678	5966	31.9	230.4	2038	178	245
2007	20941	4463	1253	5716	27.3	301.7	1601	241	275
2008	24665	6531	1336	7867	31.9	404.5	2150	281.3	417
2009	25256	3192	1653	4485	17.8	468.4	2300	297	500
2010	34495	5396	1908	7304	21.2	562.9	1736.3	309	658
2011	38151	8849	1139	9988	26.2	649.5	2099.9	438	701
2012	41177					710.26	4365.4	474-9	848.6
2013	44133					796.6	3719	433.6	985.5

Source: CBN Statistical Bulletin (2013 and Various Previous publications)

The GDP was at current purchasing prices. All Naira values are in₦'000M. `

*Percentage calculated by the author.

The average percent of oil and non-oil revenue to the GDP since 1994 was 27.5 percent. This was derived by dividing total percentage of 494.8% by number of years (i.e. 570 / (18).This percentage is significant enough to tempt one to conclude that tax revenue had contributed highly to economic growth in Nigeria. Taxes are used as proxy for fiscal policy (Tosun and Abizadeh 2005). According to Anyanwu (1993), three basic objectives would be achieved; raising revenue for government; a means of regulating the economy and economic activities; and the control of income and employment. Furthermore, taxes are used to regulate the production of certain goods and services, production of infant industries, control business and check inflation, reduced income inequalities. As the major source of government revenue, such revenues are used by government to provide public goods and services, to maintain law and order, defense

against external aggression, regulation of trade and businesses to ensure social and economic stability. In developed economies, taxes are used also to provide food to the poor, medical care to the elderly and for hundreds of other purposes. It can be concluded that economic growth may be a m irage in the absence of taxes and more horribly government could not exist.

2.6 The Graphical Relationship.

The relationship between GDP and the Taxes in Table 1 above is depicted in figure 1- the graph bellow. The Kernel Density graph displays a kernel density estimate of the distribution of a single series. Heuristically, the kernel density estimator is an adjusted histogram in which the "boxes' the histogram are replaced by "bumps" that are smooth (Silverman, 1986). Smoothing is done by putting less weight on observations that are further from the point being evaluated.

2.7 Combinatorial and Synergistic Analysis

In mathematics and traditional statistics, there are two special system of counting. These are permutation and combination.

Let n be a positive integer and r, a positive integer less than or equal n. The number of different arrangements of r things taken out of n dissimilar things is denoted by nP_r. Each such arrangement is called a permutation of n things taken r at a time. For example, all the arrangement of two letters chosen out of (abc) are: ab, ba, ac, ca, bc, cb. The order of the letters matters.

In combination, these are like permutation, but with the important difference that the order in which the letters are arranged is disregarded. In the order of (abc) on two letter arrangements, the combinations are: ab, ac, bc. If $0 \leq r \leq n$, then, the number of combination of r objects taken out of n objects is denoted by nC_r.

2.8 Combinatorial Analysis of the Taxes
Given the major four taxes, CEX, CIT, PPT and VAT, the combinatorial analysis is the list of one tax base, two tax bases, three tax bases and four tax bases out of the list. This results in $4C_1 + 4C_2 + 4C_3 + 4C_4$:

Figure 1

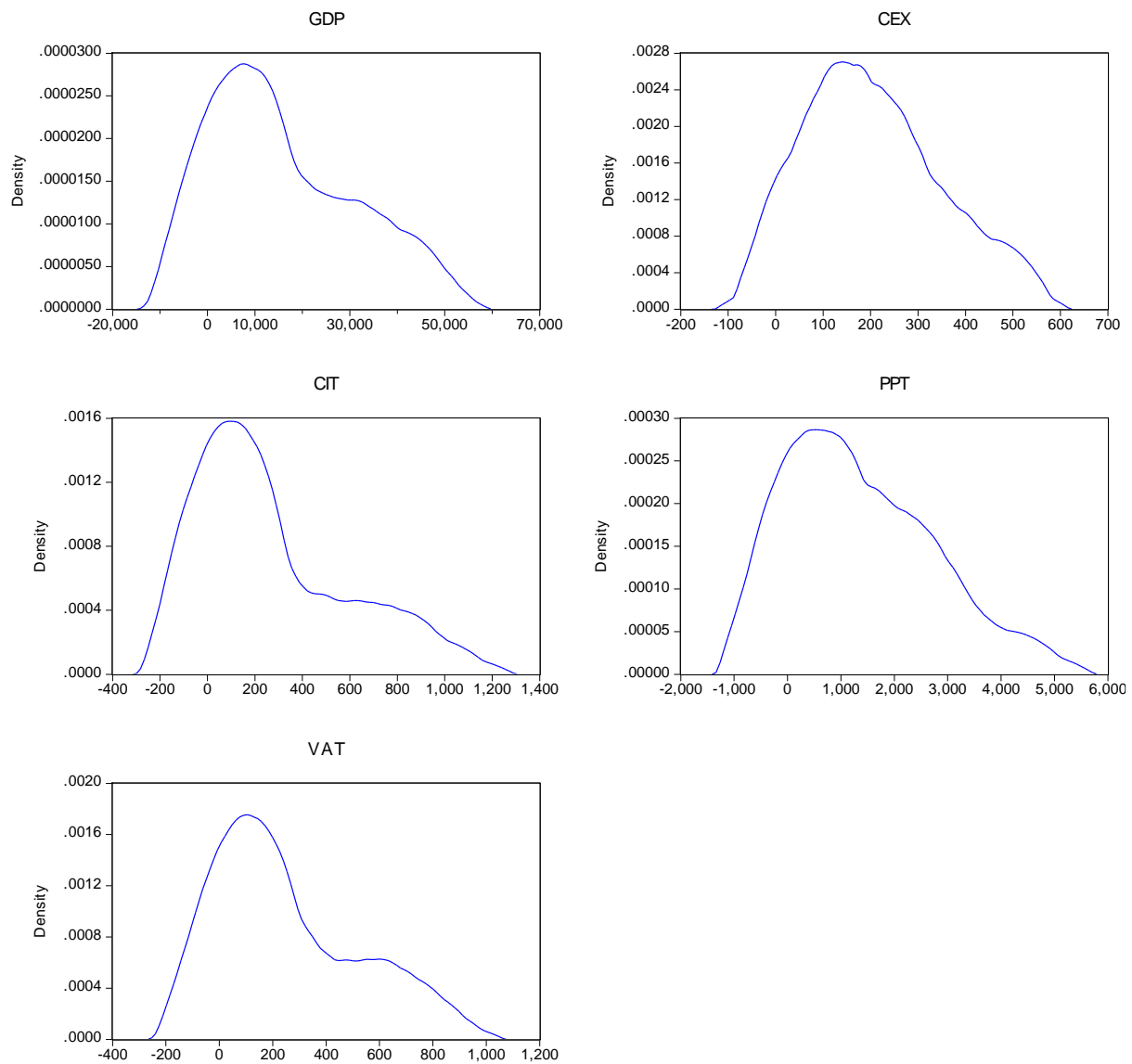$^4C_1$ = (CEX); (CIT); (PPT); (VAT)

$^4C_2$ = (CEX, CIT) ;(CEX, PPT); (CEX, VAT); (CIT, PPT) ; (CIT, VAT); (PPT, VAT)

$^4C_3$ = (CEX, CIT, PPT); (CEX, CIT, VAT); (CEX, PPT, VAT);(CIT, PPT, VAT)

$^4C_4$ = (CEX, CIT, PPT, VAT) making up the 15 combinations for the combinatorial econometric models in Table A-1

2.9 Synergistic Analysis

A synergy is a concept of combined efforts such that the outcome is more than an individual effort put together. A synergic slang normally rings that 2+2 = 5. A synergistic analysis of the 15 econometric models is the pulling together of all the effects of the independent variables on the GDP in form the number of significance of each variable in the models out of the 8 times each variable appears. This synergistic analysis was in Table A-2

3. Methodology

3.1 Data Collection

The data used for this study were historical facts usually referred to as secondary data. This annual time-series data covered the period from 1994 to 2011. Data were obtained from the CBN (2011-2013) Statistical Bulletin. Other sources include CBN Annual Reports (2005 – 2013) editions. The GDP at current purchasing prices in CBN Statistical Bulletin (2011:129-131), were used and supplemented by CBN Annual reports 2012 and 2013. Data for VAT, CIT, PPT and CEX for 2009 – 2011 were from CBN Annual Reports 2009 page 96; 2010 page 94 and 2011 page 104 supplemented by 2012and 2013 Annual Reports. The exclusion of the cost of collection may distort trended expectations. Education tax and personal income taxes were excluded to allow a focused assessment of the four prominent taxes which are exclusively under the legislative control of the Federal government..

3.2 Model Specification

There are 15 econometric models formulated for the study. The models are represented by the equations 1 – 15 below which are the combinatorial analysis of CEX, CIT, PPT and VAT.

3.2.1 The Combinatorial Models

1. $GDP_1t = \alpha_0 + \alpha_1 CEXt + \mathcal{E}_t$

2. $GDP_2t = a\beta_0 + \beta_1 CITt + \mathcal{E}_t$

3. $GDP_3t = \delta_0 + \delta_1 PPTt + \mathcal{E}_t$

4. $GDP_4t = k_0 + k_1 VATt + \mathcal{E}_t$

5. $GDP_5t = \varphi_0 + \varphi_1 VATt + \varphi_2 CITt + \mathcal{E}t$

6. $GDP_6t = \acute{\varnothing}_0 + \acute{\varnothing}_1 VATt + \acute{\varnothing}_2 PPTt + \mathcal{E}t$

7. $GDP_7t = \sigma_0 + \sigma_1 VATt + \sigma_2 CEXt + \mathcal{E}t$

8. $GDP_8t = \rho_0 + \rho_1 CITt + \rho_2 PPTt + \mathcal{E}t$

9. $GDP_9t = \tau_0 + \tau_1 CITt + \tau_2 CEXt + \mathcal{E}t$

10. $GDP_{10}t = \mu_0 + \mu_1 PPTt + \mu_2 C/EXt + \mathcal{E}t$

11. $GDP_{11}t = \lambda_0 + \lambda_1 VATt + \lambda_2 CITt + \lambda_3 PPTt + \mathcal{E}t$

12. $GDP_{12}t = \pi_0 + \pi_1 CITt + \pi_2 PPTt + \pi_3 CEXt + \mathcal{E}t$

13. $GDP_{13}t = \omega_0 + \omega_1 VATt + \omega_2 CITt + \omega_3 CEXt + \mathcal{E}t$

14. $GDP_{13}t = \gamma_0 + \gamma_1 VATt + \gamma_2 PPTt + \gamma_3 CEXt + \mathcal{E}t$

15. $GDP_{15}t = z_0 + z_1 VATt + z_2 PPTt + z_3 CITt + z_4 CEXt + \mathcal{E}t$

where:

GDP_it = Gross Domestic Product at current purchasing prices for equation i at period t.

This is the dependent variable is the proxy of economic growth in Nigeria.

VATt = Value Added Tax for the period

CITt = Company Income Tax for the period

PPTt = Petroleum Profit Tax for the period

CEXt = Custom and Excise tax for the period.

$\mathcal{E}t$ = Stochastic or error term

VATt, CITt, PPTt and CEXt were all explanatory variables and each variable appeared eight (8) times in the combinatorial models.

3.2.2 Modifying the Models

When there is the presence of serial correlation in a model (equation), ordinary least square may not be appropriate without modification. Gujarati (2004) hinted that the residual variance may underestimate the true variance; this may overestimate the R^2 (and consequently) the adjusted R^2. The t and F-tests are no longer valid and if not corrected, may likely give serious and misleading conclusions about the statistical significance of the estimated regression coefficients. The test results in this study suggest that we need to modify our original specification to take account of serial correlation.

The Durbin-Watson statistic can be difficult to interpret. To perform a more general Breusch-Godfrey test for serial correlation in the residuals, the **LM Test for Serial Correlation** would be used. The statistic labeled "Obs*R-squared" that appeared in the LM table (if E-View 7 is used), is the LM test statistic for the null hypothesis of no serial correlation. If the probability of no serial correlation is zero, there is a strong indication of the presence of serial correlation in the residuals from the equation. Then we specify an order of serial to test against. Entering "1" yields a test against first-order serial correlation. The probability of no serial correlation in Table 2 below is 0.1984. Conversely, the probability of serial correlation is (1-0.1984) 8016. This LM Test is on model 1 and only the top and variable portion is exhibited in Table 2

Table 2 Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.543859	Prob. F(2,16)	0.2437
Obs*R-squared	3.235293	Prob. Chi-Square(2)	0.1984

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	252.9133	1741.975	0.145188	0.8864
CEX	-0.669403	7.130188	-0.093883	0.9264
RESID(-1)	0.362300	0.266744	1.358231	0.1932
RESID(-2)	0.109473	0.269176	0.406698	0.6896

Another approach is to include lags of the independent variables. This involves adding variables to the existing equation, to include lags for each of the original explanatory variables.

$$GDP_1t = \alpha_0 + \alpha_1 CEXi + GDP\ (-1) + CEX\ (-1)$$

A popular method of accounting for serial correlation is to include autoregressive (AR) and/or moving average (MA) terms in the equation. This was the method used in this study. To estimate the model with an AR (1) and/or MA (1), just add the terms to the respective models with serial correlation. Model 1 was modified as:

$GDP_1t = \alpha_0 + \alpha_1 CEXi + AR\ (1) + MA\ (1)$

If AR(1) removes the presence of serial correlation, MA(1) need not be added. The models with the presence of serial correlation in this study have therefore been corrected.

3.2.3 The Actual-Fitted-Residual Graph

The actual-fitted-residual graph in figure 2 shows the deviation between the actual and the estimated as shown in the upper part starting from the intercept of about 500 terminating to about 45000. The residual is literarily the difference between the actual and estimate (fitted).
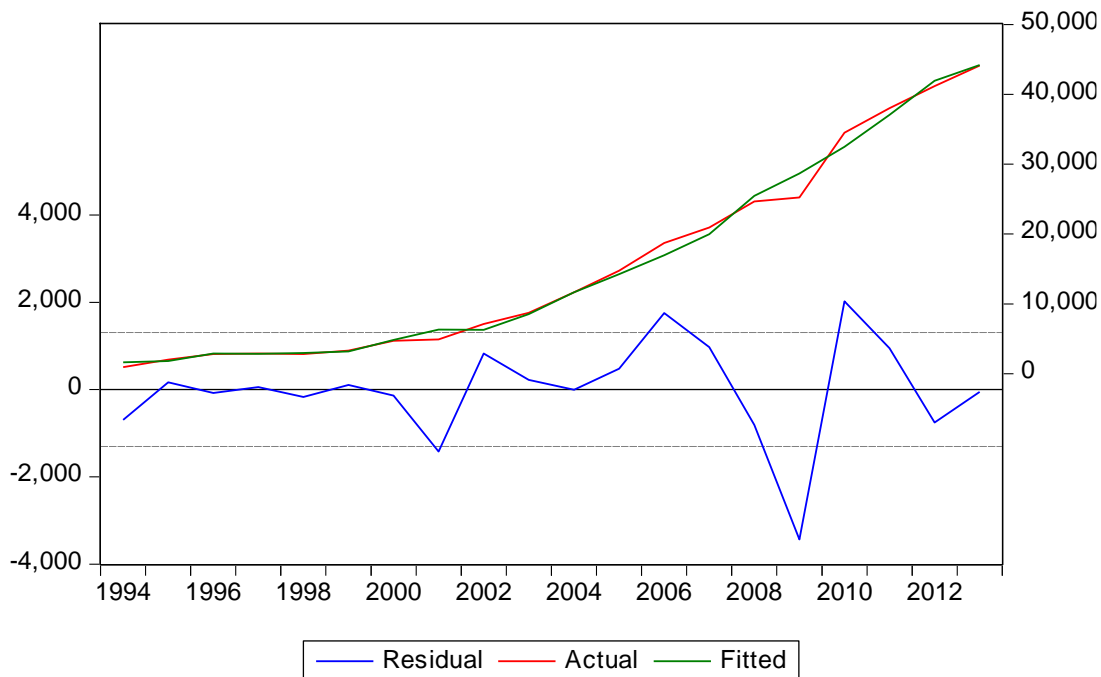
Figure 2

4. Results and Discussion

4.1 Introduction

Table A-1The results in table A-1 is the outcome of the 15 econometric models using the combinatorial analysis. The dependent variables were GDP_{1t} to GDP_{15t} for all of the respective models. The extract contains the value of the coefficients, standard error of coefficients, standard error of regression t-value, Adjusted R square (AR^2), the Durbin-Watson (d.w) statistics and the F ratio for each model. Table A-1 illustrates the models summary for the regression. The Adjusted R square is 0.92 and 0.99 which means that the explanatory variables can explain the variations in the model up to at least 92 percent. The Durbin-Watson statistics [D.W] was between 1.85 and 2.06 except models 2 and 7. F – Statistics which is significant at zero percent shows that the model is well fitted for the determination of economic growth in Nigeria

4.2 Negative coefficients of CEX and CIT - The co-efficient of CEX were negative in models 1, 7, 11, 12, 13, 14, and 15. The only relieve was that it was not significantly

related. On the other hand, the CIT was inversely and significantly related to GDP in models13 and 15.

The implication of the negative coefficients of CEX and CIT in Table A-1 could be interpreted reducing or working contrary to the GDP. Taking the coefficient of the CEX as an example in model 7 with the coefficient of CEX being -5.98, is interpreted as: with the influence of the other explanatory variable held constant; as CEX changes, say by one percent, on the average, the GDP changes by 5.98 percent in the opposite direction. The CEX was basically to discourage the importation of some good and services the government may deem fit not beneficial to the citizenry. The other role is to discourage the consumption of negative goods such as alcoholic beverages and tobacco. Therefore, the objectives of CEX were not likely being achieved and hence such importation and consumption of such goods and services were already detrimental to the economy rather than supporting it.

In case of CIT, a high rate of 30% would have discouraged investment and as such would affect economic growth. The latent effect may result in tax evasion and desperate tax avoidance .In the extreme, companies may leave Nigeria and decide to invest outside the country as in the case of many companies that had previously left the country.

Table A-2 showed the number of significance of each independent variable out of the 8 possible frequencies of occurrences. In the synergistic analysis, the VAT and PPT were ranked first with 6 times out of the maximum of 8 times of occurrence with75 percent each. Next was CIT that ranked third with the significance frequency of 4 out of 8 times and a scored 50 percent. The last was CEX which was significant 3 out of 8 times resulting in a percentage of 37.5percent. The overall synergy was 59.34 percent.

5. Conclusion and Recommendations

This study had evaluated the effects of the tax bases (VAT, PPT, CIT and CEX) on economic growth in Nigeria as exhibited in Table A-1.. While VAT and PPT had been contributing positively to the growth of the economy, the other taxes the CIT was passive while the CEX was inversely related to the GDP. The only relieve was that CEX was not negatively significant. The percentage of significance were calculated for each of the tax bases in Table A-2

One could conclude that on the average, a synergic effort of the four independent variables produced an output of 59.34'% significance, taking the average of the respective percentage scores. Efforts should be made by the government to reduce CIT rate as an incentive to encourage investment and discourage capital flight to foreign countries.

For CEX, an enduring strategy should be put in place to address the importation of some goods and services that are sabotaging the economy and also the consumption of some goods that were also detrimental to the health and well-being of the citizenry.

Reference

[1] Aadekansola, O. 2007."Taxation as a means of Economic Revitalisation. Limitations and Prospects in a Developing Economy," The Nigerian Accountant (Oct-Dec 2007):pp.55-57

[2] Anyanwu, J. C. 1993. "Monetary Econometrics: Theory, Policy and Institutions." Onitsha: Hybrid Publishers.

[3] Ariyo, A. 1997. "Productivity of the Nigerian Tax System: 1970-1990," African Economic Research Consortium Nairobi: AERC Research Paper 67

[4] Audu, T. 2012. "Tax System Administration in Nigeria" Daily Trust Medical Trust Nigeria Ltd. http;//www.dailytrust/.com/.

[5] CBN (Central Bank of Nigeria) 2011. "Statistical Bulletin," 22 (December 2011): pp.129-131

[6] CBN (Central Bank of Nigeria) 2011. "Annual Reports." 31st December 2011: Abuja: CBN.

[7] FGN(Federal Government of Nigeria) 2003. "Nigerian Tax Reform in 2003 and Beyond: The Main Report of the Study Group on the Nigerian Tax System," Abuja, July.

[8] Gujarati, D. N. 2004. Basic Econometrics Fourth Ed. Singapore, The McGraw-Hill Company

[9] Ijewere, E. I. 1991. "Past, Present and Future of Tax Legislation in Nigeria," Paper Presented at a National Workshop on Tax Structure and Administration in Nigeria, Lagos, 15 – 17 May.

[10] James, S. and C. Nobles. 2008. Economics of Taxation. 8th ed. Birmingham: Fiscal Publications.

[11] Jones, C. I. 1997. "Economic Growth" Encyclopedia Americana 9, pp.598 – 99.

[12] Kanjanataratu, Orakanya and KomsamSuriya. 2014. "Sales Forecasting with Limited Information: Comparison between cumulative observations and rolling windows" The Empirical Econometrics and Quantitative Economics Letters 3, 1 (March 2014): pp. 11-24

[13] Silverman, B. W. 1986. Density Estimation for Statistics and Data Analysis, London: Chapman & Hall.

[14] Suriya, Komsan and Sumate Pruekreedee. 2014. "Bounded Rational Corruption Model," The Empirical Econometrics and Quantitative Economics Letters 3, 1 (March 2014): pp. 1-10.

[15] Tosun, M. S. and S. Abizadeh. 2005. "Economic Growth and Tax Component: An Analysis of Tax Change in OECD," Applied Econometric37 pp. 2251 – 63.

Appendices

Table A- 1 Econometric Analysis of the 15 Models: A combinatorial Analysis***

Model	Coefficients	Standard Error		t-value	Sig	AR²	d.w.	ANOVA		REM
		Coefficient	Regression					F-Stat	Prob	
1 (Constant) CEX	990701. -1.47180	-9425.8 -2.65	1918.4	-1.17 -0.21	.260 0.834	0.98	1.851	331.8	0.00	
2 (Constant) CIT	50436.6 27.5741	269112. 164392	1647.4	0.187 2.414	0.85 0.028**	0.98	1.82	677.1	0.00	
3 (Constant) PPT	1460.1 10.53	1507.1 0.782	4008.8	0.969 13.47	0.347 0.000*	0.92	1.92	107.7	0.00	
4 (Constant) VAT	2201.5 54.06	1450.3 3.549	1597.2	1.51815. 23	0.149 0.000*	0.99	1.93	480.9	0.00	
5 (Constant) CEX CIT	4659.5 37.38 7.798	4501.3 6.327 11.718	1692.5	1.035 5.908 0.665	0.318 0.000* 0.517	0.98	2.07	321.0	0.00	
6 (Constant) CEX PPT	2622.2 51.63 5.503	3485 22.64 2.053	359j7.5	0.752 2.28 2.679	0.464 0.039** 0.017**	0.93	1.858	68.33	0.00	
7 (Constant) CEX VAT	3045.9 -5.980 56.12	2151.6 11.187 6.183	1586.3	1.415 -0.54 9.077	0.177 0.600 0.000*	0.98	1.834	487.5	0.00	
8 (Constant) CIT PPT	6665.5 38.395 -0.105	4614.6 7.1787 0.8631	1708.9	1.444 5.348 -0.12	0.171 0.001** 0.905	0.98	2.16	314.8	0.00	
9 (Constant) CIT VAT	3520.5 17.907 31.344	2792.74 14.759 19.842	1619.1	1.261 1.153 1.579	0.228 0.268 0.137	0.98	1.909	351.1	0.00	
10 (Constant) PPT VAT	1679.8 1.5479 47.585	885.05 6.9119 4.6035	1482.9	1.898 1.698 10.34	0.077 0.110 0.000*	0.99	1.861	558.6	0.00	
11 (Constant) CEX	4065.5 -1.739	2490.3 8.2685	1778.7	1.632 -0.21	0.127 0.837	0.98	2.14	232.5	0.00	

CIT	39.13	5.5941		6.994	0.000*					
PPT	1.2405	1.457		0.854	0.408					
12 (Constant)	3687.2	3041.8	1678.8	1-212	*0.247*	0.98	1.89	261.3	0.00	
CEX	-2.315	15.939		-0.14	*0.887*					
CIT	15.355	18.328		0.838	*0.417*					
VAT	34.413	28.913		1.190	*0-255*					
13 (Constant)	3943.9	1485.5	1419.2	2.655	*0.019*	0.99	2.12	366.6	0.00	
CEX	-27.64	8.528		-3.24	*0.006***					
PPT	2.959	1.0083		2.934	*0.012***					
VAT	53.41	7.5115		7.119	*0.00**					
14 Constant)	738.5	542.12	1375.4	1.362	*0.192*	0.99	2.01	690.3	0.00	
CIT	-17.78	9.826		-1.81	*0.089*					
PPT	2.268	0.800		2.83	*0.012***					
VAT	66.18	13.079		5.059	*0.001***					
15 (Constant)	1576.9	720.35	1305.2	2.189	*O.045*	0.99	2.15	575.6	0.00	
CEX	-17.74	10.66		-1.66	*0.117*					
CIT	-31.21	12.33		-2.53	*0.023***					
PPT	2.849	0.836		3.408	*0.004***					
VAT	88.45	18.26		4.844	*0.002***					

a. Dependent Variable: GDP_{cpp}

* The independent Variable is Significant at 1 percent level.

** The independent Variable is Significant at 5 percent level.

***Extract from E-View 7.1 Outputs.

Table A-2: The Models and the Frequencies of Significance of Independent Variables: Synergistic Analysis (Extract from Table A-1)

Variables	Models															Summary			
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sig	Out of	Percent	Rank
CEX	N				Y	Y	N				N	N	Y		N	3	8	37.5	4
CIT		Y			N			Y	N		Y	N		N	Y	4	8	50.0	3
PPT			Y			Y		N		Y	N		Y	Y	Y	6	8	75	1
VAT				Y			Y		N	Y		N	Y	Y	Y	6	8	75	1
OVERALL SYNERGY																19	32	59.34	

The symbol "Y" (YES) stands for significant variables in the respective models

 "N" (NO) stands for variables not significant in the respective models