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Tax Structures and Economic Growth in Nigeria: Disaggregated Empirical Evidence

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Abstract
This paper seeks to investigate the empiricism behind the *New National Tax Policy* in Nigeria by employing co-integration and error correction as methods of empirical estimation with an empirical strategy of disaggregation. In line with the objective of the paper, empirical results indicate that while the policy of direct taxation is significantly and positively correlated with economic growth, indirect taxation proved insignificant with its negative impact on economic growth in Nigeria. The paper indeed ascertained that the tax-based revenue profile in Nigeria is skewed towards direct taxes. By implication, the global transition from direct taxation to indirect taxation lack empirical justification in developing countries such as Nigeria. Thus, we recommend that rather than expand the indirect tax structures, the government should expand the structures of direct taxes in Nigeria. A major contribution of the paper to knowledge is the fact that on the basis of the hypotheses tested, the empirical paper closes the knowledge gap induced by inconclusive evidence on the growth effects of taxation composition which most often has resulted in situations where empirical findings of researches done in developed economies are generalized to developing countries.

Key words: Tax structures, direct taxation, indirect taxation, economic growth, Nigeria,

1. Introduction
The policy of taxation in Nigeria is directed towards achieving some specific objectives which include amongst others revenue generation and upholding economic growth. Recently, the Nigerian government introduced the *National Tax Policy [NTP]*. This is a policy geared towards shifting from direct to indirect taxation in Nigeria. The choice between direct and indirect tax has elicited serious debate in terms of economic benefits and limitations that characterized each. Thus, most studies have reached substantially different conclusions on the relative impact of direct and indirect taxes on economic growth with multiplicity of problems ranging from inconclusive findings, chaotic generalization of results and findings in developed countries to developing countries [see Avi-Yonah and Margalioth (2006) and Burgess and Sten (1993)]. According to Avi-Yonah and Margalioth (2006), direct taxation accounts for about two third of the total tax revenue generated in developed countries. But proponents of the conventional wisdom hypothesis are advocating for the use of indirect taxation. To them, developing countries should focus on indirect taxation [Burgess and Sten (1993)]. Indeed, the results of most studies are saddled with inconsistencies. While some researchers like Lee and Gordon (2005), Jones *et al.* (1993), Li and Sarte (2004), Kneller *et al (*1999), Wildmam (2001), Avi-yonah and Margolioth (2006), reported a positive relationship between indirect tax and economic growth, others such as Emran and Stigliz (2005), Gordon and Li (2005), Baunsgaard and Keen (2005), Abizadelh (1979), Chelliah (1989) disputed the above finding and instead reported the relative importance of direct taxation as the driver of economic growth. The empirical studies on the subject matter for developing countries are relatively few. The few were carried out in South Africa, Turkey and *OECD* countries. A situation where results of cross country researches in developed economies are generalized to developing countries often induce knowledge gap.

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This study seeks to close this knowledge gap in Nigeria by empirically testing the functional relationship between tax structures and economic growth using macroeconomic variables as control.

The erroneous generalization and inconclusive evidence has made the issue of growth effect of taxation especially at a country level open for further research. This in fact informed the basis of this paper. This paper so seeks to explore the empiricism behind the new *National Tax Policy* in Nigeria. In view of the foregoing, the paper attempts to provide answers to the following questions, is there a significant positive relationship between indirect tax and economic growth in Nigeria? Or is there a significant positive relationship between direct tax and economic growth in Nigeria? Thus, we hypothesized that there is no significant positive relationship between indirect tax and economic growth in Nigeria and also there is no significant positive relationship between direct taxation and economic growth in Nigeria. Following the introduction is a discussion of the tax structures in Nigeria. What follows next is the literature and thereafter, we have theoretical framework, method of empirical estimation, analysis of results and conclusion.

2. Tax Structures in Nigeria

The Nigerian Tax System has undergone significant changes in recent times. However, the tax system is basically structured in such a way as to contribute to economic growth through income generation. On the basis of incidence, taxes can be structured into direct and indirect. There are different components of direct taxation. These include the *personal income tax [PIT], petroleum profit tax [PPT], companies' income tax [CIT], educational tax [ET]*. The *PIT* is currently regulated under the Personal Income Tax Act of 2004. The *PPT* is regulated by the Petroleum Profit Tax Act *[PPTA]* of 1990. *PPT* is charged on the profit of a petroleum company in the upstream sector of the industry. Companies in Nigeria are taxed under the Companies Income Tax Act introduced in 1961 with modifications in 2007. The administration of the *CIT* is vested on the Federal Inland Revenue Services. Education tax in Nigeria is under the regulation of the Education Tax Act No. 7 that was promulgated in 1993. The tax is payable by all companies at the rate of 2 percent of the assessable profit defined in the Company Income Tax Act. Therefore, assessment of education tax and companies' income tax are done concurrently. The different prominent components of indirect taxation in Nigeria include, *Value Added Tax [VAT] and Custom and Excise Duty [CED]*. *VAT* is regulated by the *Value Added Tax Act [VATA]* of 2007. The Nigerian *VAT* system is destination based, which means the tax is levied on goods and services consumed within the tax jurisdiction. The implication of this is that *VAT* imposition is designed to stimulate export growth [Desai and Hines (2002)]. In Nigeria, the tax rate chargeable is 5 percent on goods and services purchased but the tax payer can claim credit for input tax when such goods are sold. The *CED* is regulated by the Custom and Excise Management Act of 1990. The duty is chargeable on all goods and services imported into Nigeria. The tax is administered by the Nigeria Custom Services and is also referred to as import duties. Currently, the duties ranged between 2.5 percent to 100 percent depending on the product.

3. Literature Review

3.1. Direct Taxation and Economic Growth

Myles (2000) empirically ascertained that direct tax policy is a stimulant to economic growth. Barry and Jules (2008) found that direct taxes impacted negatively on economic growth in the US. Margalioth (2003) reported that direct taxation is harmful to growth in endogenous growth models. The results of Mamatzakis (2005) hold that direct taxes have significant positive impact on economic growth in South Africa. Tosun and Abizadeh (2005) reported that the share of personal income tax responded positively to economic growth. McCarten (2005) found that the ratio of direct tax to *GDP* and the ratio of direct tax to total tax stimulated real *GDP* growth in Pakistan. Tosun and Abizadeh (2005) reported that corporate income taxes are the most harmful to growth as well as personal income taxes. Lee and Gordon (2005) using cross-country data found that statutory corporate tax rates are significantly and negatively correlated with cross-sectional differences in average economic growth rates having controlled for other determinant

of economic growth. Djankor *et al* (2009) found strong negative effect of personal income tax on output growth. Scarlett (2011) established empirically that an increase in the share of taxes from personal taxable income has the greatest harm on per capital *GDP* over time and correction to equilibrium from such an impact would take up to nine years. Arnold *et at* (2011) found that personal income taxes are progressive with marginal tax rates that are higher than their average rate with the implication of discouraging savings and labour supply. Arisoy and Unlukaplan (2010) tested the effect of direct-indirect tax composition on economic growth in Turkey. The empirical finding of their study holds that direct taxes have no significant effect on economic growth. Aamir, Qayyum, Nasir and Hussain (2011) found significant impact of direct taxation on the total revenue of the economy of India.

3.2. Indirect Taxation and Economic Growth

The relationship between indirect taxation and economic growth has been examined severally by different researchers. Few, if any have examined this line of research in Nigeria. Chelliah (1989) observed that an increase in indirect taxation compared to direct taxation reduces economic growth more than direct taxation does. Their research finding supports the position of Harbenger (1964). Aamir *et al* (2011)'s research findings had it that increasing revenue from indirect taxes is more conducive for economic growth in the long run in Pakistan. Ajakaiye (1999) found that *VAT* has a negative effect on economic growth in Nigeria. In a more broad study, Romer and Romer (2000) resolved that progressive taxation affords policy makers the opportunity to pursue counter-cyclical fiscal policies which drives economic growth. Specifically, they are of the view that *VAT* can only increase growth when enforcement and implementation procedures are effective. This position was strengthened by McCarten (2005). According to Bird (2003), the most effective tax for developing countries is one that produces the largest amount revenue in the least costly and disproportionate manner. He identified broad based *VAT* as an ideal tax that suits the situation. Emran and Stiglitz (2005) argued that the recent resolution that favours the gradual reduction and the subsequent elimination of sales taxes in favour of *VAT* as an instrument of indirect taxes in developing economies is worrisome. According to him, it is built on a fragile result derived from an incomplete model that relegates the presence of active informal sector.

3.3. The Consensus

From the disaggregated empirical review, it was discovered that studies on the economic growth effects of direct taxation are divided along two conflicting perspectives with majority inclining towards the negative effects of direct taxation on economic growth. On the other hand, there is a consensus that indirect taxation is growth enhancing.

4. Theory and Framework

4.1. Theoretical Framework

The theoretical framework draws from the sensitivity framework of Levine and Renelt (1992) and Feder[2]'s two-sector production technology approach [Feder (1982)]. Given that the Nigerian economy is made up of the public and the private sectors, the conventional, continuous and twice differential production technologies are presented as:

$$G = G(H_g, K_g), \quad P = P(H_p, K_p + G) \qquad \textbf{(3.1)}$$

Given that G represents the government or public sector, P represents the private sector, H is the labour input, K is the capital input, subscripts g and p represents the sectoral inputs. The total inputs of the formal and informal sectors can be specified as:

[2] Feder (1982) formulated separate production function for the export and non export sectors of the economy and assumed equality of marginal productivity between the two sectors.

$$H = H_p + H_g \ , \quad K = K_p + K_g \qquad \textbf{(3.2)}$$

The aggregate national output *(Y)* which is the output combination of both the government and private sectors is then given thus:

$$Y = G + P \ \equiv F(H_{g,} K_{g;} H_{p,} K_{p,}\ G) \qquad \textbf{(3.3)}$$

Totally differentiating the aggregate output with respect changes in inputs and in the share of government spending, we have that:

$$\Delta Y / Y = \Delta G / G(G / Y) + \Delta P / P(P / Y) \qquad \textbf{(3.4)}$$

Where Δ indicates changes in variable, with variation in relative factor productivity of both sectors, the relation can be specified as the one below:

$$G_H / P_H = G_K / P_K = (1 + \zeta) \qquad \textbf{(3.5)}$$

Where $G_H = \partial G_H / H_g$ is the marginal product of labour in the government sector, $P_H = \partial P_H / H_p$ is the marginal product of labour in the private sector, $G_K = \partial G_K / H_g$ is the marginal, product of capital in the government sector, $P_K = \partial P_K / H_p$ is the marginal product of capital in the private sector. The private sector output can be described in terms of the individual contributions of capital and labour as the factor inputs as well as the external effects of the government. Hence,

$$\Delta Y / Y = \Delta K / K + \Delta H / H + \Delta G / G + \Delta G / G[(G / Y)] \qquad \textbf{(3.6)}$$

Given that $\Delta G / G$ is the rate of change of total government activities, to determine the actual contribution of government sector to output, we remove the external effects of government, that is, private sector productivity share in terms of government activities. From equation (3.5) the government output is:

$$G_H / P_K = G_K / P_H = 1/(1 + \zeta) \qquad \textbf{(3.7)}$$

Therefore, the share of productivity of the private sector in terms of government output is given as:

$$= 1/(1 + \zeta)\left[\Delta G / G(G / Y)\right] \qquad \textbf{(3.8)}$$

$$= \Delta G / G(G / Y) - \left\{1/(1 + \zeta)\right\}\left[\Delta G / G(G / Y)\right]$$

$$= 1 - (1/(1 + \zeta))[\Delta G / G(G / Y)]$$

$$= \zeta /(1 + \zeta)[\Delta G / G(G / Y)] \qquad \textbf{(3.9)}$$

Given that $\Delta G / G$ represents the externality of government activities to the private sector, the external effect of government on the private sector is then derived by subtracting the share of government in total output from $\Delta G / G$, that is,

$$\Delta G / G - [\Delta G / G(G / Y)] \qquad \textbf{(3.10)}$$

Equation (3.10) indicates the external effect of government on the private sector. Combining equation (3.9) and (3.10), equation (3.6) can be modified as:

$$\Delta Y / Y = \Delta K / K + \Delta H / H + \Delta G / G - [\Delta G / G(G / Y)] + \left\{\zeta /(1 + \zeta)\right\}[\Delta G / G(G / Y)] \qquad \textbf{(3.11)}$$

Taking the investment-output ratio as the share of private sector capital contribution, equation (3.11) can be re-modified as the one below:

$$\Delta Y / Y = INY + \Delta H / H + \Delta G / G - [\Delta G / G(G / Y)] + \left\{\zeta /(1 + \zeta)\right\}[\Delta G / G(G / Y)] \qquad \textbf{(3.12)}$$

Taking the elasticity effect and marginal shares and expressing equation (3.14) in stochastic form, we have that:

$$\begin{aligned}\Delta Y/Y &= \varphi_1(INY)+\varphi_2(\Delta H/H)+\varphi_3[\Delta G/G- \\ &\quad \Delta G/G(G/Y)]+\{\zeta/(1+\zeta)\}[\Delta G/G(G/Y)] \\ &= \varphi_1(INY)+\varphi_2(\Delta H/H)+\varphi_3(\Delta G/G)- \\ &\quad \varphi_3[\Delta G/G(G/Y)]+\{\zeta/(1+\zeta)\}[\Delta G/G(G/Y)] \\ &= \varphi_0+\varphi_1(INY)+\varphi_2(\Delta H/H)+\varphi_3(\Delta G/G)+ \\ &\quad [[\zeta/(1+\zeta)]-\varphi_3][\Delta G/G(G/Y)]\end{aligned} \quad \textbf{(3.13)}$$

To concretely measure the growth effect of taxation, we further abstract from Koch et al (2005) and Ulukaplan (2010) whereby we assume a consistent long-run relationship between government expenditure and taxation. Therefore, government expenditure *(G)* can be proxied with taxation *(T)* with disaggregated into direct and indirect taxes components such that:

$$G = T = DTX = NTX \quad \textbf{(3.14)}$$

$$\Delta G/G = [(\Delta DTX + \Delta NTX)/G] \quad \textbf{(3.15)}$$

Substituting equation (3.15) into equation (3.13), we have as follows:

$$\begin{aligned}\Delta Y/Y &= \varphi_0+\varphi_1(INY)+\varphi_2(\Delta H/H)+\varphi_3[(\Delta DTX+\Delta NTX)/G]+ \\ &\quad [[\zeta/(1+\zeta)]-\varphi_3][[\Delta DTX+\Delta NTX]/G)([\Delta DTX+\Delta NTX]/Y)]\end{aligned} \quad \textbf{(3.16)}$$

Therefore, taking partial differentials with respect to the tax structures, we have:

$$\begin{aligned}&\varphi_0+\varphi_1(INY)+\varphi_2(\Delta H/H)+ \\ &\quad \varphi_3(NTX)[(\Delta NTX/NTX)(NTX/T)]+ \\ &\quad \varphi_3(DTX)[(\Delta DTX/DTX)(DTX/T)]+ \\ &\quad [[\zeta/(1+\zeta)]-\varphi_3][(\Delta NTX/NTX)(NTX/Y)]+ \\ &\quad [[\zeta/(1+\zeta)]-\varphi_3][(\Delta DTX/DTX)(DTX/Y)]\end{aligned} \quad \textbf{(3.17)}$$

Re-arranging for the growth rate of *GDP,* we have the benchmarked growth equation given by:

$$\begin{aligned}\Delta Y/Y &= \varphi_0+\varphi_1(INY)+\varphi_2(\Delta H/H)+ \\ &\quad \varphi_3(DTX)[(\Delta DTX/DTX)(DTX/T)]+ \\ &\quad [([\zeta/(1+\zeta)]-\varphi_3)(\Delta DTX/DTX)(DTX/Y)]+ \\ &\quad \varphi_3(NTX)[(\Delta NTX/NTX)(NTX/T)]+ \\ &\quad [([\zeta/(1+\zeta)]-\varphi_3)(\Delta NTX/NTX)(NTX/Y)]+\varepsilon_t\end{aligned} \quad \textbf{(3.18)}$$

4.2. Statistical Test Line Growth Equation

The empirical model consists of the test line equations in addition to the robust equation. The specifications of the equation together with its error correction version are rooted on the theoretical framework.

$$\begin{aligned}Ln(GPD) &= \varphi_0+\varphi_1 Ln(DTX)+ \\ &\quad \varphi_2 Ln(NTX)+\sum_{t=1}^{3}\varphi_t Ln(Z)+\varepsilon_{1t}\end{aligned} \quad \textbf{(3.19)}$$

$$\begin{aligned}Ln(GPD) &= \varphi_0+\varphi_1\Delta Ln(DTX)+ \\ &\quad \varphi_2\Delta Ln(NTX)+\sum_{t=1}^{3}\varphi_t\Delta Ln(Z)+\varphi_{ecm}ECM+\varepsilon_{2t}\end{aligned} \quad \textbf{(3.20)}$$

By definition, $\boldsymbol{Z}$ is a control vector of explanatory variables namely, the growth rate of population in Nigeria *[PGN],* inflation rate in Nigeria *[INF]* and openness of the Nigerian economy to the world *[OPN]*. Given that ε_t represents the error component of the model, φ_3 represents the impact of taxation on the private sector in the Nigerian economy. Hence, the significance of $\varphi_3 DTX$ and $\varphi_3 NTX$ is an indication that *direct and indirect* taxes impact economic growth in Nigeria. The impetus for the disaggregation is derived from the fact that the hypothesis and economic motivations underlying the components of taxation in Nigeria are indeed different due mainly to heterogeneous motivations. In effect, the growth impact of taxation in Nigeria could be induced by the different tax composition. This point is essential in our modeling approach because the tax structures of the Nigerian tax system as a developing country is very different from those of the developed. If there are J distinct tax structures in the Nigerian tax system, the public budget constraint implies the following identity of revenue generation:

$$\sum_{f=1}^{J} T_{f,it}^{I} = 1$$

Allowing each element of taxable income to have an impact on growth leads to a generalization of the growth model which suffers the multicollinearity problem amongst the elements of the vector $T_{f,it}^{I}$ where, $T_{f,it}^{I} = [DTX, NTX]$ arising from the identity of the budget constraint. In effect, it implies that we specify two test line regression equations for the direct and indirect tax structures. However, we further disaggregated direct taxation into its components of *educational tax, company income tax, petroleum profit tax and personal income tax*. Similarly, the indirect taxation is disaggregated into components of *VAT and custom and excise duties* within the Nigerian framework.

$$Ln(GPD) = \varphi_0 + \varphi_1 Ln(PPD) + \varphi_2 Ln(CNT) + \varphi_3 Ln(PDT) + \varphi_4 Ln(EDT) + \sum_{t=1}^{3} \varphi_t Ln(Z) + \varepsilon_{3t} \quad \textbf{(3.21)}$$

$$Ln(GPD) = \varphi_0 + \varphi_1 Ln(CED) + \varphi_2 Ln(VAT) + \sum_{t=1}^{3} \varphi_t Ln(Z) + \varepsilon_{4t} \quad \textbf{(3.22)}$$

The error correction representation of the statistical test-line equations are given as follows:

$$\Delta Ln(GPD) = \varphi_0 + \varphi_1 \Delta Ln(PPD) + \varphi_2 \Delta Ln(CNT) + \varphi_3 \Delta Ln(PDT) + \varphi_4 \Delta Ln(EDT) + \sum_{t=1}^{3} \varphi_t \Delta Ln(Z) + \varphi_{ecm} ECM_{(t-1)} + \varepsilon_{5t} \quad \textbf{(3.23)}$$

$$\Delta Ln(GPD) = \varphi_0 + \varphi_1 \Delta Ln(CED) + \varphi_2 \Delta Ln(VAT) + \sum_{t=1}^{3} \varphi_t Ln(Z) + \varphi_{ecm} ECM_{(t-1)} + \varepsilon_{6t} \quad \textbf{(3.24)}$$

Where PDT is personal income tax as a percentage of total direct tax, PPD is petroleum profit tax as a percentage of total direct tax, CNT is the company income tax as a percentage of total direct tax, EDT is education tax as a percentage of total direct tax, CED is custom and excise duties as a percentage of total indirect tax, VAT is value added tax as a percentage of total indirect tax, GPD is annual growth rate in

real *GDP*, is investment-income ratio, a measure of physical capital stock, *DTX* is direct tax as a percentage of total tax revenue, *NTX* is indirect tax as a percentage of total tax revenue and β_1 *to* β_6 are the unknown parameters to be estimated.

4.3. Robustness Growth Regression Equation

To examine the robustness of the statistical test line equations, we expanded the ***Z*** vector of control variables to now include the variables of total tax revenue as a percentage of total federal revenue in Nigeria *[TFR],* human capital development in Nigeria as measured by literacy rate in Nigeria *[LTN]* and investment-income ratio *[INY]*. These variables are captured by the ***M*** vector. Thus, the robustness regression model is formulated as:

$$\begin{aligned} Ln(GPD) = {} & \varphi_0 + \varphi_1 Ln(DTX/TFR) + \\ & \varphi_2 Ln(NTX/TFR) + \\ & + [\varphi_J^P - \varphi_p^P] \sum_{J=1}^{p-1} Ln(DTX)_{J,it}^{I} + [\varphi_J^P - \varphi_p^P] \sum_{J=1}^{p-1} Ln(NTX)_{J,it}^{I} \\ & + \sum_{t=1}^{3} \beta_{Zt}(Z) + \sum_{t=1}^{3} \varphi_{Mt} Ln(M) + \varepsilon_{7t} \end{aligned} \tag{3.25}$$

The error correction version of equation (3.27) is thus specified

$$\begin{aligned} \Delta Ln(GPD) = {} & \varphi_0 + \varphi_1 \Delta Ln(DTX/TFR) + \\ & \varphi_2 \Delta Ln(NTX/TFR) + \\ & + [\varphi_J^P - \varphi_p^P] \sum_{J=1}^{P-1} \Delta Ln(DTX)_{J,it}^{I} + [\varphi_J^P - \varphi_p^P] \sum_{J=1}^{P-1} \Delta Ln(NTX)_{J,it}^{I} \\ & + \sum_{t=1}^{3} \varphi_{Zt} \Delta Ln(Z) + \sum_{t=1}^{3} \varphi_{Mt} \Delta Ln(M) + \varphi_{-} ECM + \varepsilon_{8t} \end{aligned} \tag{3.26}$$

The terms $[\varphi_J^P - \varphi_p^P] \sum_{J=1}^{P-1} \Delta Ln(DTX)$ and $[\varphi_J^P - \varphi_p^P] \sum_{J=1}^{P-1} \Delta Ln(NTX)$ capture the variables that could survive significance under the baseline estimation for direct and indirect tax composition respectively.

5. Materials and Methods

5.1. Empirical Methodology

The estimation technique for this research is the co-integration and error correction. The choice of this technique is rooted on the need to undertake the causal inspection of most time series data to examine the data for stationarity. A time series is said to be non stationary if the mean and the variance is time dependent. By intuition, a time series is said to be stationary if the mean and variance is constant over time. In a situation where non stationary data are used for econometric analysis, the statistical inference will be misleading because coefficients are erroneously estimated [Granger (1986)]. Econometrically, it is vital to test for stationarity since intuitively; it is assumed that time series data are by their nature non stationary. In this regard, the *Augmented Dickey-Fuller [ADF] and the Phillips-Peron [PP]* tests are utilized. The choice of the *ADF* test is premised on its strength over different sampling experimentations [Sargan (1964)]. The *ADF* test is based on the regression equation:

$$\Delta F_t = w_1 + w_2 t + s F_{t-1} + \alpha_i \sum_{i=1}^{g} \Delta F_{t-i} + \in_t$$

Where $\Delta F_t = F_t - F_{t-1}$ and F_t is the variable under unit root test and $\in_t$ is a white noise error term. The theory that underlies the analysis in this paper is the prediction that when two or more time series are integrated of the same order, a linear combination of such data will produce variables that are co-integrated. Co-integration thus holds when there is a long-run relationship or equilibrium. Co-integration allow for the possibility of estimating a long run relationship between variables which may not be stationary. The *Johansen's* co integration technique is adopted in this paper. Using the *ECM,* the short-run dynamics estimate any dynamic adjustments between real *GDP* growth rate and the tax variables in their respective order of integration. While co-integration relates variables in levels, the *ECM* corrects the deviation from equilibrium of the explained variable on the basis of the changes in the explanatory variables.

5.2. Data

Annual data from 1975-2011 were utilized for estimation. Data on taxes were sourced from the *Federal Inland Revenue Services, Abuja.* National output growth as measured by average annual growth rate of real *GDP* was obtained from the Statistical Bulletin of the *Central Bank of Nigeria (CBN)*. The literacy rate for the period covered was sourced from the statistics of the *Federal Ministry of Education, Abuja.* Openness is the ratio of the sum of exports and imports to *GDP.* The population growth rate was sourced from the *National Population Commission.* The yearly inflation rates were collected from the *CBN's statistical bulletin.*

6. Results

6.1. Analysis of Stationarity Test Results

The results of the *ADF and PP* test statistics are as reported in Table1**.** Both the *ADF and PP* test statistics provide evidence of non-stationarity of all the variables in level except the investment-income ratio and growth rate of *GDP.* In sum therefore, the unit root tests revealed that with the exemption of investment-income ratio and the growth rate of gross domestic product, no other series could gain stationarity at level judging from the fact that their test statistics at level are smaller than the critical values at the 1 percent level of significance. All other variables in the study however, became stationary after first differencing. The *ADF* results are in accord with those of the PP as regard the order of integration for all the variables in the study. Stationarity as obtained dismisses any trace of spurious regression estimates.

6.2. Analysis of Co-integration Test Results

Table 2 reports the Johansen's co-integration results. Evident from the likelihood ratio, the hypothesis of no co-integration amongst the variables in each equation is rejected and at least one co-integrating relationship exists at the 5 percent and 1 percent levels of significance respectively. In effect, the co-integration results indicate a remarkable evidence of the existence of a long-run relationship between economic growth and taxation together with a sequence of other control variables in Nigeria. In effect, the variables do not drift away from each other except for temporary fluctuations. The statistical inference of co-integrated analysis portrays the long-run relationships between integrated variables in the study.

6.3. Disaggregated Estimates of the Impact of Taxation on Economic Growth in Nigeria

Table 3 shows the robust error correction estimates of the impact of taxation on economic growth in Nigeria under three different estimations. The error correction coefficients in the three estimations show that 72.65 percent, 79.86 percent and 80.68 percent respectively of the total disequilibrium from the long-run growth of real output is corrected for within one-year. The t-ratios of the one-year lagged values of the error correction (-3.295), (-9.237) and (-4.568) are all statistically significant and negative. This indeed confirms a good fit and hence adequate adjustment between the short-run and long-run of the disequilibrium of *GDP* growth rate. The measures of statistical fitness of the regression estimates namely, the coefficient of determination, t-statistic and F-statistic are significant at the 5 percent level. The

coefficients of model determination having been adjusted for degrees of freedom for the three estimations are 63.5 percent, 86.5 percent and 82.5 percent respectively. Thus, having adjusted for degrees of freedom, the estimated error correction equations have a good, high and hence a reliable explanatory power. The F-values (64.43), (46.00) and (26.56) are statistically significant. On the part of individual significance, the two direct tax components namely, the ratio of the petroleum profit tax to total direct tax and the ratio of the company income tax to total direct tax that had earlier exhibited significant correlate with the growth rate of GDP under the baseline estimation maintained their significance still under the robust estimation having expanded the set of control variables. The only indirect tax component namely, the ratio of custom and excise duties to total indirect tax in Nigeria that was significant under the baseline estimation could not sustain such significance in the subsequent estimation. This is seen from the t-values of (1.526) and (1.283) in estimations 2 and 3 respectively. The diagnostic tests results are statistically satisfactory in all the estimation.

6.4. Parsimonious Results of the Impact of Taxation on Economic Growth in Nigeria

Table 4 shows the parsimonious error correction estimates of the impact of taxation on economic growth in Nigeria. As it were, the insignificant variables wee dropped from the parsimonious estimation. Indeed, we followed the Hendry's general to specific approach implying that some of the variables that could not survive significance beyond the likelihood of chance were dropped from the final estimation. Evidently, only the direct components of petroleum profit tax and company income tax could sustain statistical significance under the parsimonious estimation. In other words, these variables maintained their significance up to the final estimation. The insignificance of the total indirect tax in the composition of total tax revenue could be explained by fiscal irresponsibility on the part of the government, ambiguous interpretation of existing laws and inadequate coverage. For example, the informal sector is neglected in the scheme of revenue drive through taxable income. The *VAT* variable had previously failed the test of significance under the baseline regression for the indirect tax components. The petroleum profit tax passes the test of significance beyond the likelihood of chance. The ratio of total direct tax to total tax revenue individually sustained significance with an enormous t-ratio of (11.335). This corroborates the theory that direct taxation is growth enhancing in Nigeria. Indeed, the most essential instrument for stimulating economic growth in Nigeria is direct taxable income. The residual test statistics as reported suggest that the model is well behaved. In fact, the diagnostic test results are satisfactory. The plots of the cumulative sum of residuals *[CUSUM]* and cumulative sum of squares of residuals *[CUSUMSQ]* show that the coefficient vector is stable, over the sample period [Figure 1]**.** Evidently, stability is endured for the period under analysis. This empirically gives credence to statistical robustness of our results in the study.

6.5. Policy Implications of Results

Direct taxation in Nigeria is imperative. The global transition from direct taxation to indirect taxation seems to lack empirical justification in Nigeria. Petroleum profit and company income taxes are the most effective sources of generating taxable income for enhancing economic growth in Nigeria. Indirect taxation in Nigeria has negative effect on economic growth. Thus, the favourable tax structure is the one that gives weight to direct taxation policy in Nigeria. This indicates a significant change in the tax burden from indirect to direct taxation.

6.6. Synthesis of the Present Empirical Evidence with Previous Empirical Evidence

Empirical evidence found in this study is that direct taxation is growth enhancing. This result contradicts those Koch, Schoeman and Van-Tonder (2005), Bary and Jules (2008), Arisoy and Unlukaplan (2010). The study reported negative and insignificant impact of total indirect tax in the composition of total tax revenue. This empirical finding is also not substantiated by the empirical results of Wildmam (2001), Dahby (2003) and Avi-yonah and Margolioth (2006) where a positive correlation between indirect tax revenue and economic growth has been documented. On the basis of the fact that the economic environment under which the Nigerian economy operates as an emerging economy differs from those of

the Asia, Europe and America, it thus implies that the objective of promoting economic growth through the instrumentality of taxation ought to generate conflicting results and hence contradictory evidences.

7. Conclusion and Contribution

In the study, an empirical investigation of the effect of taxation on economic growth was carried out. Results of empirical tests show the statistical significance of economic growth effects of direct taxable income while and the statistically insignificant negative effect of indirect tax revenue in the composition of total tax revenue on *GDP* growth. The empirical findings hold that the policy of direct taxation is a veritable instrument in enhancing the growth rate of the Nigerian economy. In effect therefore, economic growth in the short-run can be stimulated with the use of direct tax policy. Thus, the New National Tax policy which emphasizes policy shift from direct to indirect taxation has no empirical justification in Nigeria. Based on the empirical findings obtained in this paper, we nevertheless recommend that the implementation of direct taxation should be strengthened in Nigeria. This means that the current emphasis on the global transition from direct to indirect taxation as a means of stimulating growth should be down played in Nigeria. It lacks empirical justification in Nigeria. Rather than expand the indirect tax structures, the government should expand the structures of direct taxes in Nigeria. The empirical paper closes the knowledge gap induced by inconclusive evidence on the growth effects of taxation which most often has resulted in situations where results of researches done in developed economy are generalized to developing countries. The study is country specific and it utilized time series data and thereby overcomes the cross-country analysis that undermines variable differentials, productivity differentials as reflected in different production functions and above all, country differentials. Previous empirical studies adopted cross-country with cross section data analysis to relate measures of tax composition and economic growth undermining the fact that cross-sectional studies can only obtain pooled estimates that fails to disentangle results for any specific country. And because the parameters are heterogeneous across subsets of units and errors might be non-random across temporal units. In addition, the study made a significant methodological improvement on taxation and economic growth analysis in view of the disaggregation of the tax vector.

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APPENDIX

Table1: Results of Stationarity Tests based on *ADF and PP* Test Methods

Variables	*Unit Root Test Results*					*Result*
	PP Test Results		*ADF Test Results*		*Integration Order*	
	Drift &Trend	*Critical Value @ 1%*	*Drift &Trend*	*Critical Value @ 1%*		
Ln[GPD]	*-9.899*	*-4.549*	*-6.473*	*-4.482*	*I(1)*	*Stationary*
Ln[DTX]	*-5.943*	*-4.549*	*-6.692*	*-4.482*	*I(1)*	*Stationary*
Ln[NTX]	*-5.943*	*-4.549*	*-5.692*	*-4.482*	*I(1)*	*Stationary*
Ln[CNT]	*-6.854*	*-4.549*	*-5.722*	*-4.482*	*I(1)*	*Stationary*
L[PDT]	*-7.837*	*-4.549*	*-5.877*	*-4.482*	*I(1)*	*Stationary*
Ln[PPD]	*-6.722*	*-4.549*	*-5.7546*	*-4.482*	*I(1)*	*Stationary*
Ln[EDT]	*-4.924*	*-4.549*	*-6.493***	*-4.482*	*I(1)*	*Stationary*
Ln[CED]	*-5.526*	*-4.549*	*-5.754*	*-4.482*	*I(1)*	*Stationary*
Ln[VAT]	*-5.985*	*-4.549*	*-5.833*	*-4.482*	*I(1)*	*Stationary*
Ln[INF]	*-5.985*	*-4.549*	*-5.398*	*-4.482*	*I(1)*	*Stationary*
Ln[PGN]	*-7.568*	*-4.549*	*-6.373*	*-4.482*	*I(1)*	*Stationary*
Ln[OPN]	*-9.382*	*-4.549*	*-5.666*	*-4.482*	*I(1)*	*Stationary*
Ln[INY]	*-5.555*	*-4.549*	*-5.233*	*-4.482*	*I(1)*	*Stationary*
Ln[LTN]	*-6.587*	*-4.549*	*-6.996**	*-5.482*	*I(1)*	*Stationary*
Ln[TFR]	*-6.266*	*-4.549*	*-5.2853*	*-4.482*	*I(1)*	*Stationary*

Table 2: Co-integration Tests Results based on Johansen's Maximum Likelihood

Equation 1					
No of Co-integrating Relations	*Lag Length*	*Likelihood Ratio*	*5% Critical Value*	*1% Critical Value*	*Statistical Inference*
$H_0 : r = 0$	*1*	*284.734**	*68.52*	*176.07*	*Co-integrated*
$H_0 : r \leq 1$	*1*	*373.859**	*24.24*	*133.57*	*Co-integrated*
Equation 2					
$H_0 : r = 0$	*1*	*237.279**	*44.15*	*103.18*	*Co-integrated*
$H_0 : r \leq 1$	*1*	*246.842**	*58.52*	*22.07*	*Co-integrated*
Equation 3					
$H_0 : r = 0$	*1*	*237.867**	*226.0*	*168.36*	*Co-integrated*
$H_0 : r \leq 1$	*1*	*346.336**	*224.24*	*133.57*	*Co-integrated*
Notes: *r denotes the number of co-integrating vector*					

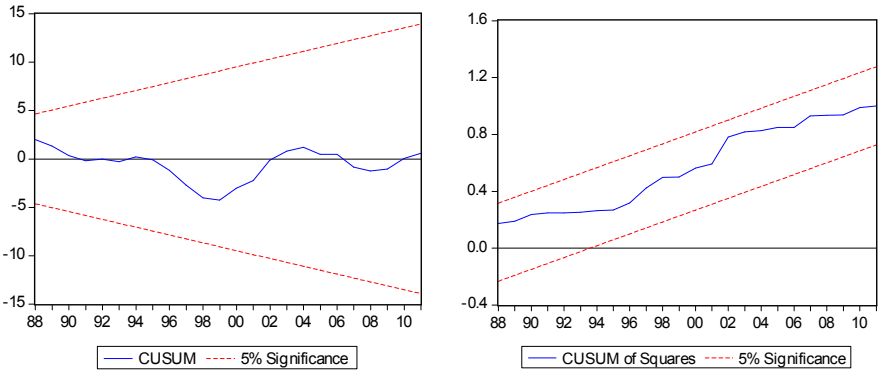
Table 3: Disaggregated Error Correction Estimates of the Impact of Taxation on Economic Growth in Nigeria

Explanatory Variables	*Dependent Variable: D[GPD]*		
	Estimation 1	*Estimation 2*	*Estimation 3*
Intercept	*-1.043(-0.388)*	*-3.553(-0.332)*	*-1.329(-0.033)*
Direct Tax Component(s)			
Δ Ln[CNT]	*1.324(4.592)****	*0.272(13.696)****	*1.073(5.283)****
Δ Ln[PPD]	*1.472(22.545)****	*1.362(2.374)***	*1.344(5.003)****
Δ Ln[DTX]		*1.028(9.595)****	
Indirect Tax Component(s)			
Δ Ln[CED]	*0.2542(3.339)***	*0.152(1.526)*	*0.232(1.283)*
Δ Ln[NTX]		*-1.059(-0.587)*	
Control Variable(s)			
Δ Ln[INF]	*-1.262(-9.662)****	*-2.573(-3.230)***	*-1.082(-5.528)****
Δ Ln[PGN]	*2.402(2.975)***	*2.068(2.859)***	*2.385(1.128)*
Δ Ln[OPN]	*1.107(7.525)****	*1.229(11.564)****	*1.454(6.663)****
Δ Ln[INY]			*1.176(5.048)****
Δ Ln[LTN]			*-0.266(-0.455)*
Δ Ln[TFR]			*2.086(3.076)***
Error Correction Coefficient			
$ECM_{(t-1)}$	*-0.725(-3.295)***	*-0.796(-9.237)****	*-0.808(-4.568)****
Diagnostic Test Statistic(s)			
R^2 [Adjusted R^2]	*0.65[0.635]*	*0.873[0.865]*	*0.839[0.825]*
F-statistic[Prob.]	*64.3[0.000]*	*46.0[0.000]*	*26.56[0.000]*
Durbin-Watson	*2.083*	*2.068*	*2.024*
B-G LM Statistic [Prob.]	*33.66[0.500]*	*42.03[0.002]*	*6.35[0.009]*
ARCH Test Statistic [Prob.]	*0.337[0.039]*	*1.206[0.045]*	*1.05[0.302]*
Jarque-Bera Statistic [Prob.]	*0.399[(1.862]*	*1.828[1.0526]*	*1.062[0.029]*
Ramsey RESET Test[Prob.]	*2.002[0.002]*	*20.859[0.000]*	*8.270[0.000]*
*Note: ***(**) indicates statistical significance of variables at 1%(5%) levels respectively*			

Table 4: Parsimonious Error Correction Estimates of the Relationship between Taxation on Economic Growth in Nigeria

Explanatory Variables	*Dependent Variable: D[GPD]*		
	Coefficients		
Intercept	*2.282(0.258)*		
Δ Ln[CNT]	*0.553(2.499)***		
Δ Ln[PPD]	*1.545(5.556)****		
Δ Ln[DTX]	*1.087(11.335)****		
Δ Ln[INF]	*-0.060(-2.889)***		
Δ Ln[OPN]	*1.083(5.399)****		
Δ Ln[INY]	*1.850(2.860)***		
Δ Ln[TFR]	*0.828(2.363)***		
$ECM_{(t-1)}$	*-0.635(-3.225)****		
Model Validation: Diagnostic Test Statistics			
Test	*Measure*	*Chi-Square Statistic [Probability]*	*Statistical Inference*
Goodness-of-Statistical Fit	R^2 *(Adjusted*R^2*),F-st*	*96.8(95.5),109.7*	*Significant*
Normality	*Skewness*	*6.222[0.000]*	*Positive*
	Kurtosis	*28.635[0.000]*	*Mesokurtic*
	Jacque-Bera	*1.033[0.564]*	*Gaussian Normality*
Serial Correlation	*Durbin-Watson*	*2.084*	*Absent*
	B-G LM Statistic	*0.622[0.000]*	*Absent*
Specification Bias	*Ramsey RESET Test*	*2.356[0.000]*	*Absent*
Heteroskedasticity	*White Test Statistic*	*0.836[0.000]*	*Homoskedastic Residuals*
	ARCH Test Statistic	*1.056[0.682]*	*Homoskedastic Residuals*
****(**) indicates statistical significance of variables at 1%(5%) levels respectively, t-values are reported in parenthesis below each parameter estimate, [ ] contains probabilities*			

Figure 1: CUSUM and CUSUMSQ Plots of Regression Residuals



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