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TAX REVENUE, SOCIAL WELFARE AND ECONOMIC GROWTH: EMPIRICAL EVIDENCE FROM NIGERIA

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Abstract

The paper investigates the role of tax revenue in the effect of social welfare on economic growth in Nigeria, for the period 1970-2013, using Vector Error Correction Model (VECM). The VECM results show that social welfare has a negative and significant impact on economic growth, while petroleum profit tax and value added tax mitigate the negative relationship. Using another component of tax revenue, the results further show that social welfare has a positive and significant impact on economic growth, while corporate income tax and custom and excise duty unfavourably affect the positive relationship in the country. These findings suggest that the government should use tax revenue judiciously to improve infrastructure supporting facilities and thus engender economic growth in Nigeria.

1. Introduction

A tax is a fee charged or levied by a government on a product, income, or activity. If it is levied directly on personal or corporate income, it is called a direct tax. If it is levied on the price of a commodity or service, then it is called an indirect tax. The purpose of taxation is to finance government expenditure (that will improve social well-being of citizen) and to redistribute wealth which translates to financing development of the country (Ola, 2001, Jhingan, 2004, Musgrave and Musgrave, 2004, Bhartia, 2009). Whether the taxes collected are enough to finance the development of the country will depend on the needs of the country and countries can seek alternative sources of revenue to finance sustainable development (Adegbie and Fakile, 2011). Tax revenue is the receipt from tax structures. Revenues accruing to an economy, such as Nigeria, can be divided into two main categories, which are: Oil Revenue (includes revenue from royalties, Petroleum Profit Tax (PPT), gas tax) and Non-Oil revenue (includes trade, loans, direct and indirect taxes paid by other sectors of the economy, Aids, agriculture etc).

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Taxation is a veritable source of government revenue, it is as certain as death. However, it is still debatable in the literature the optimal taxation to be imposed to enhance development without unjustly inflicting welfare cost. Economic theories of taxation approach the question of how to minimise the loss of economic welfare through taxation and also discuss how a nation can perform redistribution of wealth in the most efficient manner. Unpopular taxes have been the cause for public protests, riots and even revolutions. Occasionally, extreme unpopular tax system may lead to a regime change. In political campaigns, candidates' views on taxation often determine their popularity with voters. Naiyeju (1996) reported that the success or failure of any tax depends on the extent to which it is properly managed. However, how tax affects growth has attracted the attention of many scholars over several decades. The empirical evidence obtained from these extensive studies has been mixed[1].

Tax revenue mobilization as a source for financing development activities in Nigeria has been a difficult issue primarily because of various forms of resistance, such as evasion, avoidance or corrupt practices associated with it. These activities are considered as sabotaging the economy and are readily presented as reasons for the underdevelopment of the country. Government exists in order to effectively collect taxes from available economic resources and make use of same to create economic prosperity such that available and willing human and other resources are gainfully employed, infrastructures provided, essential public services (such as the maintenance of law and order) put in place etc., tax resistance only makes these goods unattainable. Following some reasoning, changing or fine-tuning tax rates is used to influence or achieve macroeconomic stability. Some countries like the United States and United Kingdom, which derive substantial revenue from both direct and indirect tax, have used same to create prosperity (Oluba, 2008). In Nigeria the contribution of tax revenue in particular, has not met the expectations of the government. Government has equally expressed this disappointment and has accordingly vowed to expand the non-oil tax revenue.

The role that tax revenue plays on the nexus between growth and social welfare still remain a debated issue among scholars. This is definitely a new area in the context of Nigerian economy. However, this study examines the role that tax revenue plays on social welfare – growth nexus in Nigeria covering the period 1970 to 2013.

2. Literature Review

Padovano and Galli (2002) use the marginal tax rate as the best measure of impact of tax on economic growth. Using 25 industrialized countries from 1970 to

1998, Padovano and Galli (2002) exemplified that there are negative impact of marginal tax rates and tax progressivity on economic growth. Conversely, average taxation shows that there is no effect on output growth because it is highly correlated with average fiscal spending.

In addition, Poulson and Kaplan (2008) following the work of Padovano and Galli (2002) use the marginal tax rates to examine the impact of taxes on economic growth. Prior to that, they still examined the relationship between tax and the economic growth. They estimated over the period from 1963 to 2004 by using the aggregate U.S. time series data, and find out that higher marginal tax rates had a negative impact on the economic growth in the states. The negative coefficient on the marginal tax rate is - 0.374. This value is larger than other researchers' results and accounts for a greater share of economic growth than those found in other studies because there are longer time periods covered by the present study.

Equivalently, Avila and Strauch (2008) concluded that taxation will negatively affect the economic growth. According to endogenous growth theory, taxation will affect investment decision and hence in turns of higher growth. When government imposes a higher tax rate, it will reduce the private investment and worsen the economic growth.

Lee and Gordan (2005), using the cross country data from 1970 to1997, found that various measurement of the personal tax rate is not significantly associated with the economy growth. However, they found that corporate tax rate has a negative and significant effect on the growth of the economy, even after controlling other determinants of economic growth and it will speculatively affect the entrepreneur activity. A similar conclusion offered by Skinner (1988), examined the impact of corporate tax on the economic growth by using 31 Africa countries and shows that corporate tax will negatively affect the output growth.

Yakita (2003) using the overlapping generation model assumes that under a closed economy which populated by overlapping generation of two periods lived individual without bequest motive. The study showed that interest income taxation will not necessarily boost the economic growth. This is due to the reason that tax transferred was redistributed from the old generation with financial assets to the young without financial assets. So, lower after-tax interest rate will increase the present value of the second period wage income of the young generation. Besides, incentive to save will reduce when human capital transfer from the old generation to young generation is sufficiently large. Sonedda (2009) had encountered a negative relationship between labour income taxes and economic output. He used ECM (Error Correction Method) to separate the long run relationship from the short run dynamics.

The 15 OECD countries in this research did not come across any significant short run effect. However, there is a negative and significant long run relationship between the change in labour income taxes and economic output statistically robust. This may lead us to the conclusion that income tax will affect the economic growth permanently.

Consequently, Chin and Lai (2009) set up a two-sector endogenous growth model with new generation compared to the increase in the labour income tax rate, the total tax revenues and lump-sum transfers decreases and equally distributed among generations, and concluded that tax rate on the labour income will have a negative impact on the economic growth. Wang and Yip (1992) examine the effect of consumption taxes, taxes on capital and on various factors of output for Taiwanese economy. The finding is that consumption taxes and factor income taxes (factor taxation) have opposing and mutually off-setting effect on growth rates of economic aggregates. Burgess and Stern (1993) elucidate that impediments on taxing personal income in developing countries are many, including problems of income measurement, administrative capability, low literacy and poor accounting, an economic structure dominated by agriculture and small scale often unregistered enterprises making difficult to tax incomes directly.

In between those two extremes, Smith (1996) incorporates uncertainty to examine the impact of taxation on economic growth and found that it is ambiguous. The purpose of introducing uncertainty in between taxes and growth is to capture the effect of tax policies that generally change the riskiness of disposable income. An increase in the tax rate will reduce the mean and variance of the rate of return of investment and reduce the incentive to save, hence growth will be falling just same as the model that without include any uncertainty. However, if the model comes with uncertainty, the results generally show the need to depend on the consumers. Economic growth will be reduced through saving if consumers do not like to substitute consumption over time. On the other hand, if the consumers like to substitute consumption over time, then saving will increase as tax increases. Hence, the rise in economic growth is certainty.

The empirical results from Chen (2007) had shown that there is an ambiguous relationship between income tax and economic growth. He used AK type growth models with factor income taxes, public capital stock and labour-leisure trade-offs to do the analysis. On one hand, a higher labour income tax will directly reduce the labour supply and lower the marginal productivity of capital, hence the economic growth. On the other hand, if the labour income tax is higher it will have an indirect effect on the economic growth. A higher labour income tax will increase the labour supply through the higher shadow price of capital and thus lower the consumption.

Furthermore, it is indirect negative effects on labour demand via the lower private capital and also indirect positive effect through the higher public infrastructure. Besides, he also shows that there is a negative net direct effect if the inter-temporal elasticity of substitution of labour supply is small enough, and thus higher labour income tax rates will always reduce the economic growth in the long run. Kneller, Bleaney and Gemmell (1999) using panel of 22 OECD countries, declared that endogenous growth model is derived by classifying elements of government budget into four categories: distortion or non-distortion taxation and productive or non-productive explanation.

Aregbeyen and Fasanya (2013) apply dynamic Ordinary Least Square to examine the impact of taxation on economic growth. The results show that there is a positive relationship between tax revenue and economic growth. Their study also reveals that the level of taxation is not the only effect but it also takes into account how government designs and combines the tax structures to generate more revenues and bring growth in the long run.

Owolabi and Okwu (2011) empirically evaluated the contribution of VAT to the development of Lagos State economy. Development aspects considered included infrastructural development, environmental management, education sector development, youth and social development, agricultural sector development, health sector development and transportation sector development. Results showed that VAT revenue contributed positively to the development of the respective sectors. However, the positive contribution was statistically significant only in agricultural sector development.

Ogbonna and Ebimobowei (2012) examined the impact of tax reforms and economic growth of Nigeria using relevant descriptive statistics and econometric analysis and concluded that tax reforms are positively and significantly related to economic growth and that tax reforms granger cause economic growth. Okafor (2012) adopts the ordinary least square (OLS) regression analysis using the period 1981-2007 to explore the impact of income tax revenue on the economic growth of Nigeria and the regression result indicated a very positive and significant relationship between federally collected tax revenue and economic growth in Nigeria.

Worlu and Emeka (2012) use the three stage least square (3SLS) regression framework to examine the impact of tax revenue on Nigeria's economic growth, judging from its impact on infrastructural development from 1980 to 2007. Their results show that tax revenue stimulates economic growth through infrastructural development. The study also reveals that tax revenue has no independent effect on growth through infrastructural development and foreign direct investment, simply

allowing the infrastructural development and foreign direct investment to positively respond to increase in output.

Despite numerous studies on the relationship between tax revenue and economic growth and the foregoing discussion, attention failed to be focussed on the effect taxation has on social welfare and economic growth in Nigeria. Hence, this study examines the tax revenue – social welfare – growth nexus in Nigeria.

3. Methodology and Materials

The empirical model for this study is based on the endogenous growth model. Following Tosun and Abizadeh (2005) we specified the model for this paper as thus

$$GDP_t = \beta_0 + \beta_1 TXR_t + \beta_2 SW_t + \beta_3 INV_t + \varepsilon \quad (1)$$

Where GDP = real gross domestic product is expressed in log form in the estimated model, TXR = tax revenue, SW = social welfare and measured as expenditures on health services, education and other social community services, INV = growth rate of investment and ε = error correction term. The inclusion of investment in the above model represents control variable.

From eq (1), TXR is expressed as thus:

$$TXR = f(PPT, CIT, CED, VAT) \quad (2)$$

Where PPT = petroleum profit tax, CIT = corporate income tax, CED = custom and excise duties and VAT = value added tax. These components of tax revenue are examined in the estimated model separately in order to avoid serial correlation in the model. The data for all the variables are sourced from Central Bank of Nigeria Statistical Bulletin, 2013.

In the estimation of the model, the paper adopts Vector Error Correction Model (VECM)[2] framework. A VECM is a restricted VAR designed for use with non-stationary series that are known to be co-integrated. Following Barro (1990) and Worlu and Emeka (2012), the paper expressed VECM as thus:

$$\Delta GDP_t = \beta_0 + \sum_{k=1}^{r} \alpha_k \phi_{k,t-1} + \sum_{i=1}^{n} \alpha_{1i} \Delta GDP_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta TXR_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta SW_{t-i} + \\ + \sum_{i=1}^{n} \alpha_{4i} \Delta INV_{t-i} + \varepsilon_t \quad (3)$$

Where $\phi_{k,t-1}$ represents the cointegrating equation residuals so that α_k term representing each of the adjustment coefficients. The optimal lag lengths of the model are shown by (r) and (n) and chosen by standard diagnostic tests. The error term is assumed to have the normal white noise features.

In order to determine the role of tax revenue in the effect of social welfare on economic growth in Nigeria, the paper interact tax revenue with social welfare[3] and incorporated this in the Eq (3) as follows:

$$\Delta GDP_t = \beta_0 + \sum_{k=1}^{r} \alpha_k \phi_{k,t-1} + \sum_{i=1}^{n} \alpha_{1i} \Delta GDP_{t-i} + \sum_{i=1}^{n} \alpha_{2i} \Delta TXR_{t-i} + \sum_{i=1}^{n} \alpha_{3i} \Delta SW_{t-i} + \\ + \sum_{i=1}^{n} \alpha_{4i} \Delta (TXR_{t-i} * SW_{t-i}) + \sum_{i=1}^{n} \alpha_{5i} \Delta INV_{t-i} + \varepsilon_t \quad (4)$$

Eq (4) indicates that the impact of social welfare on economic growth depends on the level of tax revenue in Nigeria. The responsiveness of steady state level of economic growth to social welfare can be determined by differentiating Eq (4) with respect to social welfare. This will give marginal effect of social welfare on economic growth as thus:

$$\frac{\partial GDP_t}{\partial SW_{t-i}} = \alpha_{3i} + \alpha_{4i} * TXR_{t-i} \quad (5)$$

From Eq (5), we calculate the threshold level of tax revenue i.e. $\alpha_{3i} / \alpha_{4i}$ (Greene, 2008; and Bailliu, 2000).

4. Empirical Results and Discussion

We perform a unit root test on each variable in our model using the Augmented Dickey-Fuller (ADF) and Phillips Perron (PP) tests. Table 1 below shows the result of the unit root tests for the variables.

Table 1

Unit Root Tests

Series	Augmented Dickey-Fuller		Phillips-Perron (PP)		Order of Integration
	Level	First Difference	Level	First Difference	
RGDP	-2.32	-5.82***	-1.43	-5.84***	I[1]
INV	-0.21	-6.14***	-0.20	-6.14***	I[1]
PPT	-2.61	-7.57***	-2.77	-25.71***	I[1]
CED	-1.92	-10.32***	-1.92	-35.11***	I[1]
CIT	-1.84	-10.60***	-1.84	-28.71***	I[1]
VAT	-0.51	-9.97***	-0.54	-18.41***	I[1]
SW	-0.32	-7.64***	0.60	-19.09***	I[1]

****, **, * indicate significance level at 1%, 5% and 10% respectively.*

With evidence of unit roots, the series are said to be integrated of order one – I(1), meaning that they must be modelled in first difference ($\Delta y_t = y_t - y_{t-1}$) to make them stationary. A time series is stationary if it does not change overtime, which implies that its values have constant variability. This enables us to avoid the problems of spurious regressions that are associated with non-stationary time series models.

After testing for unit roots, we proceed to test for co-integration (long run relationship between variables). This study uses Johansen and Juselius's (1990) definition of co-integration. Johansen's co-integration procedure was used to test for the possibility of at least one co-integrating vector between variables in the models developed for the Nigerian economy in this paper. The results of the co-integration test are reported in table 2 below and this allows the study to examine the long run relationship among the variables.

Table 2

Cointegration Test

H_o:r	$\lambda_{Max\text{-}eigen}$	0.05 Critical Value	λ_{Trace}	0.05 Critical Value
r = 0	123.3944***	46.23142	234.0621***	125.6154
r ≤ 1	41.81879**	40.07757	110.6677***	95.75366
r ≤ 2	34.47492**	33.87687	68.84895*	69.81889
r ≤ 3	19.62670	27.58434	34.37404	47.85613
r ≤ 4	8.469532	21.13162	14.74734	29.79707
r ≤ 5	6.164541	14.26460	6.277810	15.49471
r ≤ 6	0.113269	3.841466	0.113269	3.841466

****, **, * indicate significance level at 1%, 5% and 10% respectively.*

The result shows that there was at least one co-integration relationship among the variables in the model. The evidence of multivariate co-integration test results suggests that these variables move together in the long run. It is important to note that the existence of co-integration vectors among a group of variables might not imply that there was causal influence between pairs of variables included in the models of the co-integration test. More specifically, with the model incorporating tax revenue indicator and economic growth, it did not necessarily mean that changes in the tax revenue variable had significant impact on economic growth or that changes in economic growth were due to changes in tax revenue. Perhaps other variables included in the models account for the possible long-run nexus that might accomplish such co-integration. In other words, the existence of an equilibrium between a group of variables should not imply that equilibrium exists between all pairs of variables in the model. This could be established by analysing long-run multivariate causal interactions among the variables in a vector error correction model (VECM).

Following the above testing model, the paper adopts a log-linear equation using Vector Error Correction Model (VECM) to know tax revenue – social welfare – growth nexus in Nigeria. Table 3 below shows the role that tax revenue plays in the social welfare – growth nexus in Nigeria. Table 3 explains long run impact analysis among the variables.

Table 3

Co-integrating Relationship Equation

Variables	1	2	3	4
PPT_t	0.146*** [7.394]	--------	-------	-------
CIT_t	-------	-------	0.665*** [4.035]	-------
CED_t	--------	0.403*** [6.881]	-------	-------
VAT_t	-------	-------	-------	0.363* [1.801]
SW_t	-0.951*** [-6.779]	0.925*** [3.244]	0.472*** [3.694]	-0.706*** [-2.974]
$(PPT*SW)_t$	2.999*** [5.691]	--------	-------	-------
$(CIT*SW)_t$	--------	-------	-0. 760*** [-3.359]	-------
$(CED*SW)_t$	------	-3.473*** [-5.987]	-------	-------
$(VAT*SW)_t$	-------	-------	-------	0.832* [1.665]
INV_t	0.080* [1.185]	0.116 [1.142]	0.513 [0.261]	0.523*** [3.731]
C	0.913 [1.418]	-0.306 [1.294]	-0.659 [-1.094]	0.671 [0.982]

****, **, * indicate significance level at 1%, 5% and 10% respectively.*
Figures in parenthesis are t-statistic.

From table 3 above, the results show that petroleum profit tax has a positive and significant impact on economic growth in Nigeria. This implies that petroleum profit tax enhances economic growth in Nigeria. The results also reveal that corporate income tax has a positive and significant impact on economic growth in Nigeria. This result indicates that corporate income tax improves economic activities which in turn accelerate economic development. The above results also provide evidence that a custom and excise duty has a positive and significant impact on economic growth in Nigeria. This suggests that custom and excise duty is a very important factor that improves economic growth in Nigeria. Value added tax has a positive and significant impact on economic growth in Nigeria. This implies that value added tax is also one of the fiscal policy instruments that helps promote economic activities.

The results show that social welfare has a negative and significant impact on economic growth in the models of petroleum profit tax and value added tax in the economy. This suggests that health services, education and other social services did not receive adequate funds that could help enhance economic activities of the country. Whilst social welfare has a positive and significant impact on economic growth in the models of custom and excise duty and corporate income tax in the economy. This implies that social services received significant funds through corporate income tax and custom and excise duty which in turn accelerated economic growth in the country. The results further show that (in the long run) investment has a positive and significant impact on economic growth in the country. This suggests that investment accelerates economic growth in the economy if and only if the country is operating at the full employment of resources.

The results further revealed that social welfare impacted negatively and significantly on economic growth while petroleum profit tax and value added tax mitigate the negative impact on economic growth in the country. The coefficients of the relationship between social welfare and economic growth were -0.951 at $p < 0.01$ and -0.706 at $p < 0.01$ and the coefficients of interactive term were 2.999 and 0.832 in petroleum profit tax and value added tax models respectively. Based on the estimated coefficients for the social welfare variable and the interaction term, it is found that 0.32 and 0.85 (in the models of petroleum profit tax and value added tax respectively) were the threshold values that social welfare would attain before it could mitigate the negative impact of social welfare on economic growth in Nigeria. This implies that tax revenue lessens the negative effect of social welfare on economic activities in Nigeria. Moreover, social welfare has a positive and significant impact on economic growth while corporate income tax and custom and excise duty adversely affect the positive impact of social welfare on economic growth in Nigeria. The coefficients of the relationship between social welfare and economic growth were 0.472 at $p < 0.01$ (corporate income tax model) and 0.925 at $p < 0.01$ (custom and excise duty model) and the coefficients of interactive term were -0.761 and -3.473 in corporate income tax and custom and excise duty models respectively. Based on the estimated coefficients for the social welfare variable and the interaction term, it is found that 0.27 and 0.62 (in the models of corporate income tax and custom and excise duty respectively) were the threshold values that social welfare would attain before it could adversely affect the positive impact of social welfare – economic growth nexus in Nigeria. This suggests that tax revenue unfavourably affect the positive effect of social welfare on economic growth in Nigeria.

Aside, table 4 below reports the short run relationship between the variables and ECM coefficients corroborate the co-integrating relationship.

Table 4

Vector Error Correction Model Estimates

Variables	1	2	3	4
C	0.295	0.186	0.145	0.134
ΔPPT_{t-1}	-2.434* [-1.663]	-------	-------	-------
ΔCIT_{t-1}	-------	-------	0.517*** [3.466]	-------
ΔINV_{t-2}	-0.148** [-2.004]			
ECM_{t-1}	0.145*** [-2.637]	-0.111** [-1.998]	-0.269** [-2.510]	-0.241** [-1.998]
R-squared	0.306	0.352	0.259	0.451
Adj. R-squared	0.261	0.276	-0.065	0.366
F-statistic	11.66	14.76	15.79	17.12

****, **, * indicate significance level at 1%, 5% and 10% respectively.*
Figures in parenthesis are t-statistic.

From table 4 above, the results show that petroleum profit tax lagged by 1 has a negative and significant impact on the country's economic growth. This suggests that petroleum profit tax impedes economic growth in the short run. Also, corporate income tax lagged by 1 has a positive and significant impact on the economic growth in Nigeria. This implies that the corporate income tax actually enhances the economic growth. The results further report that (in the short run) investment lagged by 2 has a negative and significant on Nigeria's economic growth. This indicates that investment needs adequate attention in the economy in order to enhance the economic growth of Nigeria.

Apart from the short run analysis, the coefficients of error correction model (ECM) were used to explain the tendencies for the variable to return to an equilibrium. Theoretically, the coefficients of ECM are expected to be negative and significant. The ECM in table 4 indicates that there exists a mechanism in correcting the disequilibrium on tax revenue – social welfare – growth nexus in Nigeria. They have the right sign (i.e. negative) and are significant. The significant negative sign of the coefficients on ECM indeed supports co-integration among tax revenue, social welfare and economic growth in the country.

5. Concluding Remarks

The tax revenue – social welfare – economic growth nexus has been examined in this paper using VECM. The paper concludes that the tax revenue (measured by petroleum profit tax and value added tax) plays a pivotal role in ensuring that the negative effect of social welfare on economic growth is mitigated in Nigeria. On the other hand, tax revenue (measured by corporate income tax and custom and excise duty) plays a weak role in the positive effect of social welfare on economic growth in Nigerian economy.

However, tax revenue should be further enhanced in order to apportion significant resources that will help improve the well-being of people living in the country. This will further encourage economic activities in Nigeria. Government should also provide incentives for tax payers to generate more resources from tax which in turn will assist the economy to diversify the revenue-base of the country.

End Notes

1 On one side of these empirical studies are those who suggest that the relation is positive. Uhligha and Yanagawa (1999), Gober and Burns (1997), Gilbert (1942), Shimizutani (2006), Song (2002), Tosun and Abizadeh (2005), found a positive relation between tax and growth. At the other extreme, Padovano and Galli (2002), Engen and Skinner (1996), Folstar and Henneksan (2001), Poulson and Kaplan (2008), Avila and Strauch (2008) concluded that the association between tax and growth is negative. Kneller, Bleaney and Gemmell (1999), Smith (1996) show inconclusive results.

2 The VECM has co-integration relations built into the specification so that it restricts the long-run behaviour of the endogenous variables to converge to their co-integrating relationships while allowing for short-run adjustment dynamics. The co-integration term is known as the *error correction* term since the deviation from a long-run equilibrium is corrected gradually through a series of partial short-run adjustments.

3 The rationale behind the interaction term is that tax revenue affects the efficiency of social welfare and hence economic growth (Nili and Rastad, 2007).

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