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Tax Structure and Economic Growth in Côte d'Ivoire: Are Some Taxes Better Than Others?

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Abstract

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This paper examines the relationships between taxation and output in Côte d'Ivoire during the period 1960-2006. The bounds testing approach to cointegration devised by Pesaran et al. (2001) showed that tax variables, except direct tax, and real GDP are cointegrated and positively related in the long-run. The results of Granger causality tests indicated bidirectional causality between tax revenues and output in the long-run, implying a virtuous circle of tax and GDP. Direct taxes, however, did not cause GDP both in the short and long-run. These findings suggest that i) the tax revenues and, therefore, budget deficit, depend upon the economic activity, and ii) switching the tax burden from direct to indirect taxes is likely to have a positive effect on the economic output.

Introduction

The role of tax policy in determining long-run economic growth has been an ongoing issue in debates on economic development. The thrust of these debates has been whether the policy makers can use taxation to stimulate economic growth. Two schools of thought have discussed this issue. There are those who have long argued that taxes had little impact on growth, while policymakers aggressively pursued economic growth by using tax incentives. More recent research in the field of public finance has begun to show that high levels of taxation inhibit economic growth, and the emerging consensus among economists now suggests that tax rates matter for economic growth. Advocates of tax cuts assert that a reduction in the tax rate will lead to increased economic growth, thereby offsetting the direct loss in tax revenues resulting from the lower rate. It is even possible that the induced increase in the tax base can dominate, leading to an overall rise revenue collections. However, on further reflection, this belief may not always hold when we look at the nature of public expenditures financed by taxes. The possibility exists that an economy with higher tax rate experiences at least short-run growth if taxes are used to finance tangible public spending that benefits households and private sector.

Like many economic questions, the empirical research looking at the growth effects of taxation does not conclusively support the conventional belief. The evidence is mixed across countries, data and methodologies, with some finding a negative impact, while others find little or no significant growth effect of taxation. Most of the empirical studies have typically relied on cross-sectional or panel data regressions, which cannot satisfactorily address the country-specific issues. Cross-country growth regressions do not capture the dynamics of the relationship between variables and a significant coefficient on a tax variable does not necessarily imply causality. As Wang and Yip (1992), and Holcombe and Lacombe (2004) point out, a general problem associated with cross-country and panel studies is that they impose parameter homogeneity across countries, an assumption that can hardly be defended because of differences in geographical, institutional, social and economic structures among countries. By grouping countries that are at different stages of economic development, these studies fail to address the country-specific effects of taxation on economic growth and vice versa. Hence, any inference drawn from these studies provides only a general understanding of how the variables are broadly related, and thus offers little guidance for policy formulation. This shortcoming has brought home the usefulness of country-specific in-depth case studies in order to address heterogeneity and find deeper answers for the issue at hand. Another caveat in previous studies is the possibility of endogeneity of the tax rate, as depending upon the level of per capita income (Koester and Kormendi, 1989; Easterly and Rebelo, 1993). A simple version of this view is captured in Wagner's law which relates government expenditure to national income via the income elasticity of demand for government-provided goods and services. Few studies controlled for this concern about simultaneity using instrumental variable technique, even though they did not

provide clear empirical evidence of a causal link running from tax variables to growth (see Kneller *et al.* 1999; Lee and Gordon, 2005). It is well known that a lack of good instruments makes this approach unfeasible. The tax rate would be expected to rise when income growth more rapidly and fall when income growth slowly. The possibility of a reverse causation has not sufficiently addressed in the empirical literature.

Our aim in this paper is not to resolve the raging debate but rather to contribute to the tax policy-growth literature by examining the case of Côte d'Ivoire looking in particular if there is any evidence that taxation variables have a causal role in explaining the process of economic growth. We use various measures of tax policy and examine their impact on economic output. In the empirical analysis, we use annual time-series data for the period 1960 to 2006 to avoid the above-mentioned problems associated with cross-countries and panel studies. The remainder of the paper is organized as follows. Section 2 discusses previous literature on taxes and economic growth. Section 3 outlines the econometric methodology. Section 4 gives empirical results. Section 5 concludes.

Literature review

In neoclassical growth models of Solow (1956) and Swan (1956) fiscal variables can affect the long-run level of output but not the long-run output growth, while fiscal policy can affect only the transition path of this steady-state. Hence fiscal policy differences among countries may only explain the observed differences in income *levels* but not in long-run *growth rate.* By contrast, the endogenous growth theory pioneered by Lucas (1988) and Barro (1990) produced growth models in which public investment in human and physical capital can have long-term or permanent growth effects, and consequently there is much more scope in these models for at least some elements of tax and government expenditure to play a role in the growth process (Kneller *et al.*, 1999). Other endogenous growth models tell us that how taxation can have both a negative and a positive effect on growth rate (see Barro and Sala-i-Martin 1992; Stokey and Rebelo, 1995; Mendoza *et al.* 1997). The positive effect arises indirectly through the expenditures financed by taxation. If taxes are used to fund investment in public goods, especially goods resulting in external benefits (infrastructure, education and public health), the economic growth rate could be positively influenced by taxation. The negative effect of taxation on growth arises from the distortions to choice and the disincentive effects. As Skinner (1987) and Engen and Skinner (1996) explain, a country's tax policy can affect the stock of human and physical capital directly by

discouraging investment and lowering their investment rate. Tax policy can also influence the allocation of labour and capital, and hence their productivities.

On the empirical ground, a growing body of empirical studies has investigated the effects of taxes on economic growth. Results are far from being conclusive, varying across countries, methodologies, and fiscal variables involved. Engen and Skinner (1996), Arnold (2008) and Myles (2000) provide surveys on this literature. The influential work by Barro (1990), using a data set covering a large cross-section of both rich and poor countries, presents strong empirical evidence favoring the view that higher taxes are growth-impeding. This suggests that tax cuts would stimulate the economy. This result has been confirmed in some subsequent studies, but has been challenged in others. For example, studies such as Engen and Skinner (1992, 1996), Kormendi and Meguire (1995) and Cashin (1995) find evidence showing that economic growth is retarded by taxation. While others such as Katz *et al.* (1983), Koester and Kormendi (1989), Slemrod (1995) and Mendoza *et al.* (1997) do not detect any significant effect of taxation on economic growth. In their study, Easterly and Rebelo (1993) emphasize that the evidence on the effect of tax rates on growth rate is disturbingly fragile. Levine and Renelt (1992) and Agell *et al.* (1997) also fail to find a robust cross-country link between a variety of fiscal policy indicators and long-run growth rates.

A number of other empirical works look at the effects of different types of taxes on growth, arguing that what matters for growth is not only the level of taxes but also the way in which different tax instruments are designed and combined to generate revenues. Changes in any single tax may simultaneously affect several determinants of GDP per capita. For instance, a reduction in the labour tax may increase employment and the amount of hours worked in the economy, ultimately affecting labour utilisation. But at the same time it increases the opportunity cost to undertake higher education and, therefore reduces incentives to invest in education, ultimately affecting labour productivity. Marsden (1986) works with a cross-section data of 20 countries over the period 1970 to 1979, and finds that the average tax ratio has a significant negative impact on the average per capita growth rate of GDP. He also finds that the tax ratio has a negative effect on the growth rate of investment, although among individual categories of taxes only domestic taxes on goods and services have a significant effect. Skinner (1987) analyses the effect of taxation in Sub-Saharan Africa over the period 1965 to 1982. He finds that taxes levied on personal and corporate income reduce economic growth,

while sales and excise taxes have no significant effect on economic growth. Wang and Yip (1992) show that the structure of taxation is more important than the level of tax rate in explaining economic growth in Taiwan from 1954 to 1986. They found significant and negative impacts of specific taxes on economic growth, but the effect of total taxation is not significant. A very similar exercise is undertaken by Kim (1998). He compares economic performance and taxation in the US with those in Korea. According to his analysis, 30% of the difference between US and Korean economic growth rates can be explained by differences in the tax structure between the two countries. The remaining 70% can be ascribed to differences in technologies. He further decomposes the growth rate difference to identify which tax variables are more important in explaining the difference in growth rates. Among the tax instruments, He found labour income tax to be at least important as taxes on capital income in accounting for the growth rate diversity. Widmalm (2001) uses cross-section data of 23 OECD countries over the period 1965 to 1990, and finds that the share of taxes on personal income has negative effect on economic growth, while consumption taxes tend to be growth-enhancing. Results obtained by Arnold (2008) from 21 OECD countries over the period 1970 to 2005 suggest that income taxes (personal and corporate) are associated with significantly lower economic growth rates than taxes on consumption and property. All these findings lend support to the view that the tax structure matters for growth.

It is very likely that income growth affect tax revenues and tax structure, causing bias in the empirical analysis. The reverse causality running from growth to taxes has not been sufficiently addressed in the empirical literature. In their study Engen and Skinner (1999) recognized the endogeneity of fiscal policy as a serious problem in their analysis. Easterly and Rebelo (1993) argue that high correlation between fiscal variables and the initial level of income makes it difficult to isolate the effect of fiscal policy on growth. They present endogeneity of fiscal policy as a major factor in forming the empirical relationship between fiscal policy and economic growth. Levine and Renelt (1992) and Agell *et al.* (1997) argue that the results of international studies may suffer from simultaneity bias due to a reverse causality running from economic growth to taxes, and problems with the selection of countries and, notably, with heteroscedasticity between countries. Addressing carefully these econometric concerns using instrumental variable procedures or VAR approaches, many studies present evidence that taxation is negatively associated with economic growth (see Karras, 1999; Fölster and Henrekson, 2001; Blanchard and Perotti, 2002; Holcombe and

Lacombe, 2004; Karras and Furceri, 2009). Lee and Gordon (2005) find that the corporate tax rate is significantly negatively correlated with economic growth in a cross-section data set of 70 countries during 1970-1997. They also find that tax rate on labor income is not significantly associated with economic Growth rate. Romer and Romer (2007) use a narrative analysis to investigate the impact of changes in the level of taxation on economic activity in the US. They conclude that tax increases are highly contractionary, with an exogenous tax increase of 1% of GDP lowers real GDP over the next three years by about 3%. They also show that the negative effect of tax increases on output works primarily through investment.

Econometric methodology

Our empirical analysis has two objectives. The first is to examine how the variables are related in the long-run. The second is to analyse the dynamics causal relationships between the variables. In what follows we set out the econometric models and estimation methodology.

Testing for cointegration

The methodology used to examine the long-run relationship between taxes and economic growth, is based on the ARDL bounds testing approach developed by Pesaran *et al.* (2001). This methodology has several advantages over other widely used alternatives such as the Engle and Granger (1987) and Johansen and Juselius (1990) approaches. Firstly, the ARDL bounds test can be used irrespective of whether the variables are I(0), I(1) or mutually cointegrated. This allows us to avoid the uncertainties associated with conflicting results of the standard unit root tests and the low power of these tests. Secondly, it captures both short-and long-run dynamics when testing for the existence of cointegration. Thirdly, it performs better in the case of small samples, while the Johansen cointegration tests still require large data samples for the purpose of validity. Given that our sample size is limited with a total of 46 observations only, the bounds test is appropriate. Finally, ARDL takes into account the possibility of reverse causality (i.e. the absence of weak exogeneity of the regressors), thereby ensuring that the parameter estimates are efficient and consequently valid (Inder, 1993; Harris, 2003). This is particularly important in our study as many authors present endogeneity of fiscal policy as a major factor in forming the empirical relationship between fiscal policy and economic growth.

The bounds test involves estimating the following conditional error correction model:

$$\Delta y_t = \gamma_0 + \sum_{i=1}^{p} \delta_{1i} \Delta y_{t-i} + \sum_{i=0}^{q} \pi_{1i} \Delta F_{t-i} + \phi_1 y_{t-1}$$
$$+ \phi_2 F_{t-1} + \mu_t$$

$$(1)$$

where Δ is the first difference operator, y_t is per capita real GDP and F_t is the tax variable. Eq.(1) may also include a time trend variable and dummy variables. It should be noted that Eq.(1) is estimated using each variable as dependent variable. Herein lies one of the main assets of the bounds technique, for it indicates exactly which is the dependent variable and which is the independent variable in a particular relationship. Eq.(1) can also be interpreted as an ARDL(p, q) model. In practice there is no reason why p and q need to be the same. Therefore we allow for the possibility of different lag lengths.

Under the condition $\Delta y = \Delta F = 0$, the reduced-form solution of (1) yields the long-run model for y_t as:

$$y_t = \theta_0 + \theta_1 F_t + \mu_t \qquad (2)$$

where $\theta_0 = -\gamma_0 / \phi_1$ and $\theta_1 = -\phi_2 / \phi_1$.

The bounds testing procedure for long-run relationship between the variables is through the exclusion of the lagged levels variables in Eq.(1). The null hypothesis is $H_0: \quad \phi_1 = \phi_2 = 0$ against the alternative hypothesis that $\phi_1 \neq 0, \phi_2 \neq 0$. This hypothesis is tested using the *F-s*tatistic. However, the asymptotic distribution of this test statistic is non-standard under the null hypothesis. It depends upon: (a) the non-stationarity properties of the variables, (b) the number of regressors, and (c) the sample size. Thus, the calculated F-statistic is compared with two asymptotic critical values tabulated by Pesaran *et al.* (2001). The lower bound critical value assumes that all the regressors are I(0), while the upper bound critical value assumes that they are I(1). If the computed F-statistic exceeds the upper bound critical value then the variables are cointegrated regardless of the order of integration of the variables. Otherwise the variables are not cointegrated.

Short-run dynamics and Granger causality test

The cointegration analysis is only able to indicate whether or not the variables are cointegrated and a long-run relationship exists between them. Although evidence of cointegration implies the existence of causality, at least in one direction, it does not indicate, however, the direction of the causal relationship. Hence, to shed light on the direction of causality, we perform the Granger causality test. In the presence of cointegration, Granger-causality test requires the inclusion of a lagged error correction term within a vector error correction model (VECM) in order to capture the short-run dynamics. Accordingly, Granger-causality analysis within the VECM involves estimating the following model:

$$\Delta y_t = \alpha_1 + \sum_{j=1}^{p} \beta_{1j} \Delta y_{t-i} + \sum_{j=0}^{p} \gamma_{1j} \Delta F_{t-j}$$
$$+ \lambda_1 ecm_{t-1} + \mu_{1t} \quad (3)$$

$$\Delta F_t = \alpha_2 + \sum_{j=1}^{p} \beta_{2j} \Delta y_{t-j} + \sum_{j=0}^{p} \gamma_{2j} \Delta F_{t-j}$$
$$+ \lambda_2 ecm_{t-1} + \mu_{2t} \quad (4)$$

where ecm_{t-1} stands for the lagged error correction term derived from the long-run cointegrating relationship. In the absence of a cointegration, this term is not included and Eqs.(3) and (4) reduce to a VAR model in first differences. An error correction model enables one to distinguish between long-run and short-run Granger causality, and identify two different sources of causality. The statistical significance of the coefficients associated with the ecm_{t-1} provides evidence of an error correction mechanism that drives the variables back to their long-run equilibrium. The F-tests on the differenced explanatory variables depict the short-term causal effects, whereas the significance of the lagged error correction term based on *t*-statistics indicates the existence of a long-run causal relationship or weak exogeneity. It is also possible to perform the strong exogeneity test which indicates the overall causality by testing both the short-run and long-run causality (Engle *et al*. 1983; Toda and Phillips, 1993).

Data and preliminary analysis

To investigate the empirical link between taxes and economic growth we utilize annual data covering the period 1960 to 2006. Variables under study include GDP, total tax revenues (TAX) and its breakdown in direct taxes (TAXD), taxes on goods and services (TAXGS) and tax on international trade (TTRAD)[1]. All data are expressed in per

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[1] The tax variables are chosen based on the availability of the data over the sample period 1960 to 2006.

capita real terms using the GDP deflator and then transformed into logarithms so that they can be interpreted in growth terms after taking first difference. Data are compiled from the National Institute of Statistic and the statistics yearbook 2006 published by the Central Bank of West African States (BCEAO, 2006) and the 2008 *World Development Indicators* of the World Bank (WDI, 2008).

Over the sample period, tax revenues were always the largest component of total government revenues with more than 60%. Indirect taxes were the main sources of tax revenues. From 1960 to 2006, the proportion of tax revenues from consumption, capital, and labour taxes accounted for 42%, 8.2% and 15% respectively, which sum up to more than 65% of total revenues. During the same period, the average aggregate tax rate was around 27%. Since real total tax revenues grew at 5.45% which was less than the growth rate of real GDP (6.69%), the overall tax rate thus decreased by 1.24% annually. For the major components of taxes, the average tax rates of consumption, capital and labour were about 12.2%, 13.3% and 3.9%, respectively. The labour tax rate increased by 2% annually while the growth rates of consumption and capital taxes were not statistically significantly different from zero (see Figure 1).

Figure 1: Average tax rates over the period 1960-2006
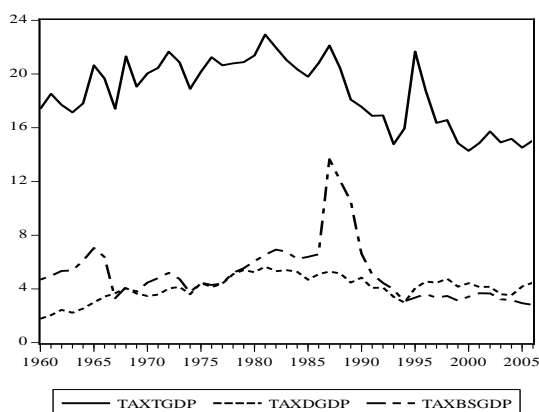
Note: Average long-run growth rates of TAXTGDP, TAXDGDP and TAXBSGDP are -0.5%, 0.9% and -0.8%, respectively.

A notable feature from this figure is that real growth rate and tax rates have varied over time since 1961. This marked variability of the tax rates over time should facilitate an empirical identification of their role for economic growth. From 1961 to 2006, the tax burden has fallen from the 18 to 23 percent range, to below 16% of GDP. The per capita growth rate has fluctuated between 13.2% and -15.1%, averaging 0.10% over the period. The peak of 13.21% occurred in 1964;

however, since 1999 the growth rate lies consistently below -0.5%. The declining trend in total tax rate from 1998 to 2006 reveals that tax revenue has grown more slowly than GDP. As such, the government tax revenue is below what would have been collected, had the tax rate been maintained over that period.

Empirical results and discussion

Unit root and cointegration tests
Many authors using the ARDL approach to cointegration state that this approach does not require the pre-testing of the variables for unit root unlike other techniques. We think that before proceeding with the ARDL bounds test it necessary to examine the stationarity status of all variables to determine their order of integration. This is to ensure that the variables are not I(2) stationary so as to avoid spurious results in the bounds test procedure. Indeed, the critical bounds provided by Pesaran *et al*. (2001) are valid under the condition that regressors are I(0) or I(1). To test the order of integration of the series, we apply the unit root tests of Dickey-Fuller (1979), Phillips-Perron (1988) and Elliott *et al.* (1996). These tests are denoted as ADF, PP and DF-GLS, respectively.

The results displayed in Table 1 show that all the variables are non-stationary in their level, but achieve stationary status after taking the first difference. Hence, we conclude that all series are I(1) at the 5% level of significance. Now that we have ascertained that the order of integration of our variables is zero or one, we can confidently apply the bounds test to cointegration. Since the bounds testing approach is sensitive to the lag length used, we use a general-to-specific modelling approach (see Hendry and Richard, 1982) and the Akaike Information Criterion (AIC) to select the optimal lag structure of the ARDL model. We study the stability of the selected ARDL model specification using the cumulative sum (CUSUM) and the cumulative sum of squares (CUSUMSQ) tests (see Brown *et al.*, 1975). We also perform a number of diagnostic tests on the residuals of the model[2]. Table 2 reports the results of the calculated F-statistics for the test of the null hypothesis of no long-run relationship against the alternative of a

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[2] In each model, both the CUSUM and CUSUMSQ plots lie within the 5% critical bound thus providing evidence that the parameters of the model do not suffer from any structural instability over the period of study (figures are not reported here to save space). Also, White and Breusch-Godfrey tests reveal that there are no traces of heteroskedasticity and serial correlation in the error terms.

long-run relationship between the two variables under study. The F-statistics are computed considering each variable as a dependent variable in the ARDL-OLS regressions. Given that the null of no cointegration is rejected the Table also reports the estimates of the parameters which describe the long-run relationship.

First, a remarkable finding from this Table is that aggregate tax is positively cointegrated with GDP. In the long-run tax has a positive impact on the long-run level of output, with a 10% rise in tax revenue resulting in a 5.49% increase in real GDP per capita. This result contrasts with the endogenous growth theory's prediction on taxation suggesting that taxes retard growth. Next, we repeat the analysis breaking taxes into different tax components. The results indicate that both taxes on goods and services and taxes on international trade have a positive long-run effect on real GDP. However, direct taxes have no long-run growth effect. Another important finding that emerges from Table 1 is the positive effect of GDP on tax revenues. This result is consistent with our expectation that growth in income expands the tax bases.

Granger causality test

We report in Table 3 the findings for long and short-run causality. The coefficients on the error correction terms are highly significant in all cases except in the TAXD-GDP relationship when GDP is the dependent variable. We can infer that there is bidirectional causality relationship between taxes variables (total taxes, taxes on goods and services and taxes on trade) and GDP in long-run. With regards to the direct taxes-GDP link, there is only a unidirectional (one-way) causality running from GDP to direct taxes in the long-run. However in the short-run the results show a bilateral causal relationship between taxes on goods and services and GDP. This little evidence of short-run causality is not surprising given the usual assumption that economic growth interacts with other macroeconomic factors in the long run rather than the short run.

The finding of a bi-directional causality between output and tax revenues in the long-run implies that the tax revenues and, therefore, budget deficit, depend upon economics. When the economy is growing a higher level of taxes is collected to fund government spending. Also economic activity gains benefit from taxes. This result is not consistent with the endogenous theory prediction suggesting that taxes retard growth. It is necessary to study further why the theoretical negative effect of taxation does not exist in Cote d'Ivoire. In theory, it is argued that if the collected taxes are used to fund investment in

public goods, especially goods resulting in external benefits (infrastructure, education and public health), the economic growth rate could be positively influenced by taxation. The negative effect of taxation is then offset by the positive production effect of higher spending on public services (Lucas, 1988; Barro, 1990; Helms, 1985). There is evidence (see Engen and Skinner, 1992; Easterly and Rebelo, 1993, Keho, 2009) that tax revenues are strongly correlated with public spending.

Since 1960, Ivorian government engaged into a vast public investment program that leads to the building of a core of social and economic infrastructure. Over the period 1960-1979, public investment accounted for 29% of the total public spending. The public investment ratio (as share of GDP) has increased from 4.8% in 1960 to 13.3% in 1979 (Keho, 2004). Many studies showed that these public investments have contributed to the relative economic prosperity of Cote d'Ivoire. For instance, Véganzonès (2001), in a panel of 87 countries including Cote d'Ivoire, found a positive growth effect of public infrastructure and a complementarity between public and private investment. These findings have been confirmed by other authors in the case of Cote d'Ivoire (see Keho, 2004, 2005; and N'Garesseum, 2004). The results of causality suggest that private agents exhibit different responses to fiscal policy in the short and long-run. In the short-run, they are affected negatively by indirect taxation, but in the long-run they adjust their behaviour so as to reverse the negative effect of taxation. Private sector can thus increase its investments to take advantage of the improvement of productivity due to public spending.

Table 1: Tests for Unit Root

Variable	Level			First difference		
	ADF	PP	DF-GLS	ADF	PP	DF-GLS
GDP	-2.237	-2.314	-1.193	-5.294*	-5.376*	-5.353*
TAXT	-2.349	-2.359	-1.438	-6.918*	-6.918*	-5.336*
TAXGS	-2.600	-2.485	-2.136	-6.653*	-7.371*	-6.254*
TAXD	-2.812	-2.788	-1.375	-5.571*	-5.572*	-4.274*
TTRAD	-2.041	-2.051	-1.604	-6.616*	-6.616*	-5.627*

Notes: ** (*) denotes rejection of the null hypothesis at the 10% (5%) level.

Table 2: Results of bounds test cointegration

F-statistic	Value	5% CV		10% CV		θ_1
		I(0)	I(1)	I(0)	I(1)	(t_stat)
$F_{GDP/TAX}$	4.944** (3)	4.94	5.73	4.04	4.78	0.549*
						(10.002)
$F_{TAX/GDP}$	13.296* (5)	6.56	7.30	5.59	6.26	1.395*
						(13.487)
$F_{GDP/TAXGS}$	18.159* (3)	4.94	5.73	4.04	4.78	0.878*
						(7.456)
$F_{TAXGS/GDP}$	8.697* (5)	6.56	7.30	5.59	6.26	1.243*
						(4.467)
$F_{GDP/TAXD}$	5.876 (5)	6.56	7.30	5.59	6.26	-
$F_{TAXD/GDP}$	7.879* (5)	6.56	7.30	5.59	6.26	1.847*
						(10.867)
$F_{GDP/TTRADE}$	22.317* (3)	4.94	5.73	4.04	4.78	0.605*
						(26.739)
$F_{TTRADE/GDP}$	8.577* (5)	6.56	7.30	5.59	6.26	1.460*
						(17.285)

Notes: The critical value bounds of the F-statistics are Pesaran *et al.* (2001). θ_1 is the long-run coefficient and figures below are the t-statistics calculated using the Δ-method. * (**) denotes statistical significance at the 5% (10%) level.

Table 3: Results of Granger causality tests

Hypothesis	Short-run causality			Long-run weak exogeneity	
	F-stat.	*p-value*	Sum of coefficients	ECM_{t-1}	t-stat.
H_0: ΔTAXT→ΔGDP	0.026	0.870	-	-0.253*	-2.108
H_0: ΔTAXGS→ΔGDP	6.377*	0.000	-0.528	-0.150*	-4.257
H_0: ΔTAXD→ΔGDP	0.741	0.395	-	-	-
H_0: ΔTTRAD→ΔGDP	4.008*	0.026	-0.270	-0.583*	-5.490
H_0: ΔGDP→ ΔTAXT	0.019	0.888	-	-0.582*	-3.200
H_0: ΔGDP → ΔTAXGS	3.011*	0.043	-4.256	-0.997*	-4.332
H_0: ΔGDP →ΔTAXD	0.050	0.823	-	-0.554*	-3.862
H_0: ΔGDP →ΔTTRAD	0.064	0.801	-	-0.413*	-1.982

Notes: For short-run causality figures reported are F-statistics with *p-value* and the sum of coefficients on lagged causal variable given in the third and fourth columns, respectively. For long-run weak exogeneity test figures reported are the coefficients on the error correction term with t-statistics in the last column. The asterisks * and ** denote statistical significance at the 5% and 10% levels, respectively.

Conclusion

The link between fiscal policy and economic growth has long been one of the most well-known and contentious issues in academic circle. While there is a growing body of empirical literature examining the growth effect of tax policy, they are derived either from using cross-sectional data or panel studies, but it is difficult to infer causality from evidence these studies. This paper contributes to the literature by providing the first evidence for Cote d'Ivoire over the period 1960 to 2006. The aim of the study was to shed light on the dynamic relationships between tax revenues and economic growth for that country. Using the bounds testing approach to cointegration of Pesaran *et al.* (2001), we found that there exist long-run relationships between tax components and real GDP per capita. In those cointegrating relationships, GDP and tax variables, except direct tax, are positively related. The results from the Granger causality tests suggest bidirectional causality between taxes and GDP in the long-run, implying a virtuous circle of taxes and GDP. Economic growth increases tax revenues mainly direct taxes. While we found causality running from GDP to direct tax revenues, we did not find evidence of a causal relationship in the reverse direction. Thus switching the tax burden from direct to indirect taxes is likely to have a positive effect on the economic output.

In terms of policy implication, our findings imply that policy makers can alter the economy's long-run level of real GDP per capita. Instead of raising tax rates or creating new taxes, more growth and revenue can be generated through a switch from direct taxes to indirect taxes. Policy makers should look towards that direction and also try to improve the tax collecting system by decentralizing the fiscal administration, eliminating fraud, evasion and corruption. On the other hand, to take advantage of the positive interaction between tax and economic development, government should also try to return taxes back to the public in an efficient manner so that they contribute to growth.

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