6

The Tax Effort*

A Comparison between Sub-Saharan Africa and Benin

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with Discussion by Nicaise Médé

1 INTRODUCTION

The 2015 Addis Ababa Conference highlighted the central role of domestic revenue mobilisation for financing development in the context of the Sustainable Development Goals. Improving tax revenue contributes not only to the financing of public spending, but also to reinforcing the accountability of the government (see Brautigam et al., 2009).

With a tax revenue to gross domestic product (GDP) ratio equal to 13.5 per cent in 2017 (IMF, 2018),[1] Benin remains below the West African Economic and Monetary Union (WAEMU) criterion of 20 per cent. Meanwhile, at the same date, Togo, a neighbouring country, managed to raise 18.3 per cent of its GDP in terms of tax revenue. Such a gap (between Benin and Togo) is not temporary, but seems to be lasting and has even increased in 2010–2015 (see Figures 6.1a and 6.1b).

Both countries inherited the same tax law, the French Tax Code, when they gained their independence – on 1 August 1960 for Benin and on 27 April 1960 for Togo. Both countries belong to the same customs and monetary union, WAEMU. The WAEMU Commission has produced several tax Directives, covering the main taxes (corporate income tax, value-added tax, excises, etc.), which aims to bring about tax harmonisation or coordination among the eight member states[2] (see Mansour and Rota-Graziosi, 2013). These Directives strictly limit any potential divergence of Beninese and Togolese tax laws after 1960. However, some

* We thank the participants of the Workshop Benin Institutional Diagnostic, which took place on 22 and 23 March 2019 in Grand Popo (Benin), for their fruitful comments.

[1] Total revenue, including tax arrears and telecommunications royalties, reached 15.4 per cent of GDP.

[2] The original member countries are Benin, Burkina Faso, Côte d'Ivoire, Mali, Niger, Senegal, and Togo; Guinea-Bissau became the eighth member on 2 May 1997.

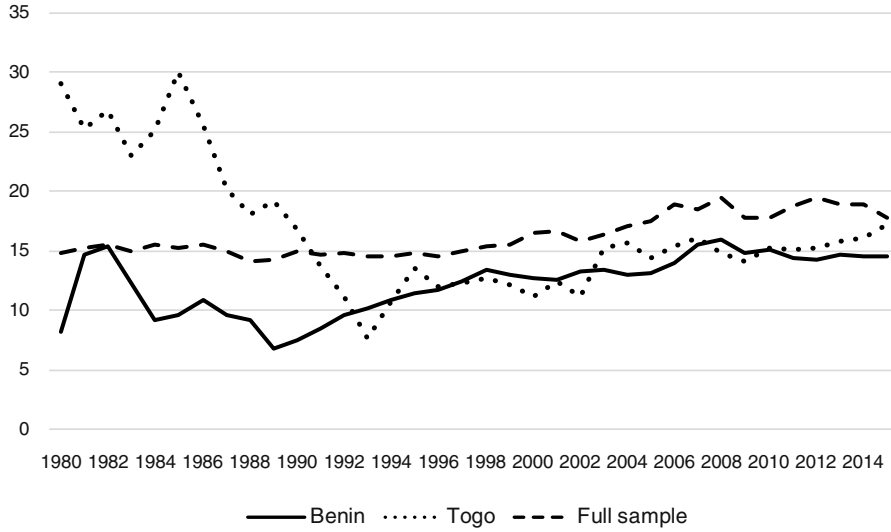

FIGURE 6.1a Share tax over GDP
Source: Authors' calculations.

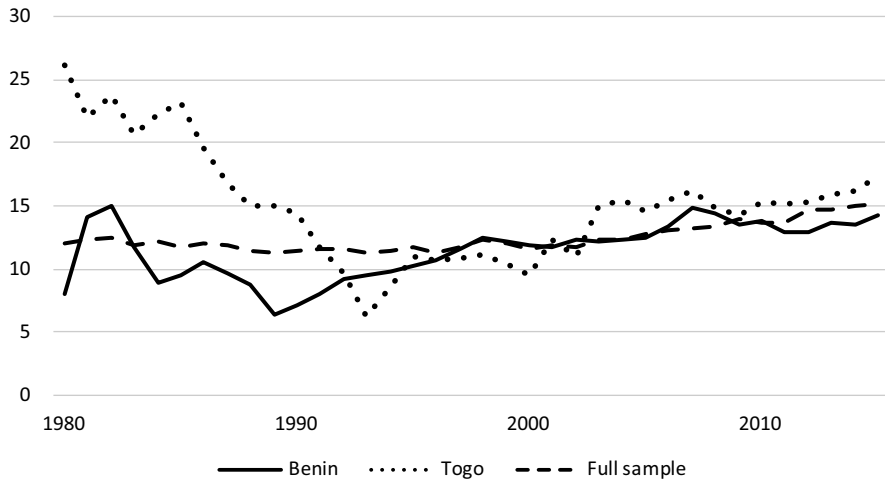

FIGURE 6.1b Non-resource tax over GDP
Source: Authors' calculations.

discrepancy may still emerge not only in the enforcement of these tax laws by the tax and customs administrations, but also as a result of the scope of derogatory regimes (for instance, the Investment Code) that generate tax expenditures.[3]

[3] Tax expenditures are tax revenue losses due to tax exemptions or tax rate reductions, for instance (see OECD, 2010). They may total 3–5 per cent of GDP. In 2015, the WAEMU Commission

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An important difference between Togo and Benin relates to the administrative side. In 2014, Togo transformed its tax and customs administrations into a single revenue authority (the Office Togolais des Recettes), while Benin has a more 'classic' organisation for French-speaking countries, with two separate administrations: tax and customs administrations.[4]

First, using a database providing information on tax revenue over the period 1980–2015, covering forty-two sub-Saharan African (SSA) countries,[5] we analyse the efforts by Benin to raise tax revenue, as relates to its structural characteristics. The analysis aims to compare the non-resource tax-to-GDP ratio in Benin with its peers, to identify whether Benin is near to, or far away from, its tax frontier, before exploring possible scope for greater tax revenue raising and for tax policy and administration reforms.

We conclude that the tax effort in Benin has remained relatively stable during the period, with an average of 63.5 per cent of its total potential tax revenue over the period, ranked fourteenth out of forty-two countries. A tax effort of 63.5 per cent means that the level of non-resource tax revenue is at 36.5 per cent of the country's maximum capacity. Knowing that, on average, Benin collects 11.45 per cent of its GDP in non-resource tax revenue and is at 63.5 per cent of its capacity, it would have raised 18.03 per cent of its GDP as non-resource tax revenue if it had used all its potential, given its characteristics. The estimated gap is higher than that estimated by Cui et al. (2016), which was 1.5–2 per cent of GDP based on a sample of SSA countries for the period 1995–2011.

The analysis identifies a higher tax effort in Togo, which exhibits a tax effort of 69.9 per cent on average and is ranked fifth out of forty-two countries. Togo would have mobilised 21.61 per cent of non-resource tax revenue as a percentage of GDP if it had made the maximum tax effort. This result appears intuitive. Indeed, Togo has a lower GDP per capita than Benin (US$6,280 for the former and US$6,480 for the latter) and its agricultural share is more important (35.73 per cent of GDP in Togo; 35.11 per cent in Benin). These characteristics penalise the mobilisation of non-resource tax. At the same time, Togo mobilises more non-resource tax revenues (15.11 per cent of GDP in Togo; 11.45 per cent in Benin). Hence, unfavourable characteristics of Togo, combined with its relative success in mobilising revenues, translate into a higher tax effort of Togo with respect to Benin.

produced a Decision committing member states to assessing their main tax expenditures and publishing these in an appendix of their respective finance law. This exercise is still ongoing in Benin and Togo.

[4] Burundi is the only other French-speaking country that has experimented with the switch to a Semi-Autonomous Revenue Authority (SARA).

[5] The country list is provided in the Appendix to this chapter.

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Second, we study the effect of some economic and institutional variables on tax effort. While the calculation of the tax effort includes only structural supply factors of the tax pressure as inputs to the stochastic frontier analysis, we then study the effect of demand factors on the estimated level of tax effort.[6] Using a logistic regression, we study in particular the effect of the presence of natural resources, aid, transparency, corruption, and accountability, and the political regime and stability. We find that aid is associated with a lower probability of belonging to a quartile of high tax effort, while institutional quality – measured by the Country Policy and Institutional Assessment (CPIA) index – increases the probability of belonging to an efficient quartile in terms of tax effort. If the effect of the political system is not clear, political stability is strongly and positively associated with a greater likelihood of having a high tax effort.

Third, we analyse the potential policy and administrative sources of the tax gaps. We shed light in particular on the human resource policy of the tax administration[7] and the remuneration mechanisms, which may be obsolete.

The chapter is structured as follows: Section II presents the tax effort estimation; Section III proposes an empirical study of the effect of some institutional and economic factors on the estimated tax effort scores; Section IV reviews some tax policy and tax administrative issues and proposes reforms, with a view to improving tax mobilisation; and Section V concludes.

II EMPIRICAL ESTIMATION OF TAX EFFORT IN BENIN: A STOCHASTIC FRONTIER ANALYSIS

We define tax effort as the extent to which the actual tax revenue collected is near the maximum level of tax resource that could be collected. In other words, tax effort in Benin is the extent to which Benin makes use of its potential for tax revenue regarding its tax base and its structural supply characteristics.

The empirical analysis is based on a sophisticated stochastic frontier analysis in which commonly used supply factors driving government tax revenue are considered as the inputs and the total non-resource tax revenue as the output (see Box 6.1). The rationale behind these methods is that an economic agent cannot exceed an 'ideal frontier', which is the optimal level of output, given the limited endowment of inputs. The tax frontier refers to the tax capacity, which represents the maximum tax revenue that a country could raise given its structural characteristics. The model used in the study by Kumbhakar et al. (2014) makes it possible to distinguish country effects, persistent inefficiency, and time-varying inefficiency. Hence, we control for

[6] The distinction between supply and demand factors is made in Bird et al. (2014).
[7] Similar information was not available for the customs administration.

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Box 6.1 Estimation Strategy: Stochastic Frontier Analysis

An approach that is increasingly being used to capture countries' tax effort is the stochastic frontier method, which was introduced in the seminal work of Aigner et al. (1977) to model firms' production behaviour (see Pessino and Fenochietto, 2010; Langford and Ohlenburg, 2015). The literature proposes several parametric and non-parametric models for stochastic frontier estimation. Data envelopment analysis (Charnes et al., 2013) and the free disposal hull (Deprins et al., 1984) are the two main – and increasingly popular – methods used for non-parametric stochastic frontier models. The main disadvantage of such methods lies in the fact that the production function is more heavily influenced by outliers, and thus more vulnerable to measurement errors (Clements, 2002).

We draw on a parametric model to estimate the tax effort as we are dealing with a single output (the total non-resource tax-to-GDP ratio). In panel data analysis, parametric models can be categorised into five groups: (1) time-invariant technical inefficiency models; (2) time-varying technical inefficiency models; (3) models that separate firm heterogeneity from inefficiency; (4) models distinguishing persistent and time-varying inefficiency; and (5) models separating firm effects, persistent inefficiency, and time-varying inefficiency. We use the model by Kumbhakar et al. (2014) that makes it possible to distinguish country effects, persistent inefficiency, and time-varying inefficiency. We estimate the following equation:

$$NRTAX_{i,t} = \alpha + X_{i,t-1}\beta + \psi_i + \phi_{it} \tag{1}$$

$$\text{where} \begin{cases} \phi_{it} = \epsilon_{it} - \eta_i - \mu_{it} \\ \mu_{it} > 0;\ \eta_i > 0 \end{cases} \tag{2}$$

The dependent variable $NRTAX_{i,t}$ (Equation 1) represents the natural logarithm of total non-resource tax revenue. The subscripts i and t and denote country and time dimensions, respectively. $X_{i,t-1}$ is a vector of structural and institutional factors explaining countries' tax ratios, which are one period lagged to mitigate endogeneity issues and to account for delays in their effect on non-resource tax revenue. Time-invariant country-level characteristics that could potentially affect government non-resource tax revenue are captured by ψ_i. The last term, ϕ_{it}, is a three-component error term (Equation 2) including time-invariant tax inefficiencies η_i (i.e. persistent tax inefficiencies owing, for instance, to sociological, cultural, religious, or geographical factors) and time-varying tax inefficiency μ_{it} (e.g. tax losses due to tax policy, tax administration, or tax officials' qualifications, which can change over time). Thus, the model makes it possible to identify persistent and time-varying factors determining SSA countries' tax effort.

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The combination of Equation 1 and Equation 2 can be rewritten as follows:

$$NRTAX_{i,t} = \alpha_0^* + X_{i,t-1}\beta + \alpha_i + \vartheta_{it} \quad (3)$$

with:

$$\alpha_0^* = \alpha - E(\eta_i) - E(\mu_{it}) \quad (4)$$

$$\alpha_i = \psi_i - \eta_i + E(\eta_i) \quad (5)$$

$$\vartheta_{it} = \epsilon_{it} - \mu_{it} + E(\mu_{it}) \quad (6)$$

Equation 3 is then estimated following a three-stage procedure: (1) In *stage 1*, the $\hat{\beta}$ is estimated by performing a random-effect-based regression (Equation 3). This stage gives the predicted values $\hat{\alpha}_i$ and $\hat{\vartheta}_{it}$ of α_i and ϑ_{it}, respectively. (2) In *stage 2*, the time-varying tax inefficiency, μ_{it}, is estimated using the predicted values $\hat{\alpha}_i$ and $\hat{\vartheta}_{it}$ from the first stage. To do this, Equation 6 is estimated by performing a standard stochastic frontier technique. Using Battese and Coelli's (1988) model, this procedure gives the prediction of the time-varying tax effort, $exp(-\mu_{it} \mid \vartheta_{it})$; (3) Finally, in *stage 3*, the persistent tax inefficiency component η_i, is estimated by performing a stochastic frontier model on Equation 5 as in the previous stage. The persistent tax effort is then predicted and given by $exp(-\eta_i)$. Hence, the overall tax effort is obtained by the product of the time-varying tax effort and the persistent tax effort.

country effects – which capture the effect of time-constant variables for each country – and obtain a total level of inefficiency that is the result of an identified persistent inefficiency and of a time-varying inefficiency for each country.

In the first stage of the estimation, countries' tax ratio is regressed on a vector of structural explanatory variables. The calculation of the tax effort includes only structural supply factors of the tax pressure as inputs to the stochastic frontier analysis. Demand factors are excluded from the estimation of the tax effort: the impact of these factors on the level of tax effort is studied in the second part of the analysis. Based on the relevant literature on the determinants of government tax revenue, we introduce the following set of inputs in the stochastic frontier analysis:

i. *The level of development*: Countries' tax capacity is positively associated with the level of economic development (proxied by real GDP per capita), which is linked to the efficiency of tax administration, the degree of economic and institutional sophistication, and the demand for public

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goods and services (see Lotz and Morss, 1967; Tanzi, 1987; Pessino and Fenochietto, 2010; Crivelli and Gupta, 2014).

ii. *Agriculture value-added (percentage of GDP)*: In addition to the numerous sectoral tax exemptions and tax holidays typically provided in developing countries, agriculture is often considered hard to tax in developing countries. Focusing on SSA countries, Stotsky and WoldeMariam (1997) emphasise that the share of value-added of this sector in GDP is negatively associated with tax revenue.

iii. *Trade openness*: Trade liberalisation policies implemented in most developing countries in the early 1970s have substantially increased trade volume in these countries. Therefore, trade openness expressed as total trade (imports and exports) as a share of GDP is expected to influence tax revenue, in particular through household consumption and domestic corporate profits (Stotsky and WoldeMariam, 1997; Pessino and Fenochietto, 2010; Keen and Perry, 2013, among others).

iv. *Financial development*: High financial development combined with high access to credit allows individuals and firms to finance profitable projects, which favour tax collection (Gordon and Li, 2009). On the other hand, in the presence of an ineffective financial system, firms can successfully evade tax payment by conducting business in cash, which is harder for tax administrations to monitor.

Table 6.1 displays the pairwise correlation between interest variables. As expected, all variables are positively associated with non-resource tax revenues, except the agriculture sector, which is significantly and negatively correlated with non-resource tax revenues. The detailed sources and definitions of variables are provided in the Appendix to this chapter (Table 6.A1).

Table 6.2 presents the summary statistics for the full sample and for Benin and Togo. Benin is generally below the mean for the full sample (except for the agriculture share). It is slightly above the average of its income group, the low-income countries. Benin and Togo have very similar characteristics. As we noted, however, the ratios of tax and non-resource tax over GDP are higher

TABLE 6.1 *Pairwise correlation between interest variables*

	[1]	[2]	[3]	[4]	[5]
(1) Non-resource taxes (% GDP)	1				
(2) GDPPC (constant 2010 US$)	0,51*	1			
(3) Total trade (% of GDP)	0,43*	0,63*	1		
(4) Agriculture, value-added (% GDP)	−0,54*	−0,62*	−0,62*	1	
(5) Financial development index	0,62*	0,37*	0,37*	−0,59*	1

Source: Authors' calculations.

* Coefficient significant at 10% level. GDPPC, gross domestic product per capita.

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TABLE 6.2 *Descriptive statistics*

Variable	Mean	Standard deviation (SD)	Median	Min	Max
Full sample					
Total taxes (% GDP)	16.19	8.97	13.79	0.57	53.33
Non-resource taxes (% GDP)	12.46	6.67	11.14	0.55	49.85
GDPPC (constant 2010 US$)	6.92	1.06	6.68	4.87	10.16
Agriculture, value-added (% GDP)	27.64	15.74	29.14	0.89	72.03
Total trade (% of GDP)	73.97	47.07	60.98	6.32	531.74
Financial development index	0.11	0.08	0.10	0.00	0.64
Benin					
Total taxes (% GDP)	11.92	2.57	12.45	6.76	16.04
Non-resource taxes (% GDP)	11.46	2.29	12.02	6.36	14.96
GDPPC (constant 2010 US$)	6.50	0.09	6.48	6.36	6.70
Agriculture, value-added (% GDP)	35.11	1.92	31.92	31.54	39.01
Total trade (% of GDP)	55.37	8.00	56.24	38.30	76.53
Financial development index	0.09	0.01	0.09	0.07	0.11
Togo					
Total taxes (% GDP)	16.89	5.96	15.28	7.71	30.15
Non-resource taxes (% GDP)	15.11	4.57	15.07	6.27	26.17
GDPPC (constant 2010 US$)	6.26	0.09	6.26	6.01	6.53
Agriculture, value-added (% GDP)	35.73	4.22	35.20	26.96	44.14
Total trade (% of GDP)	90.22	15.61	92.32	56.48	125.03
Financial development index	0.10	0.01	0.10	0.07	0.12

Source: Authors' calculations.

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on average in Togo than in Benin (Figure 6.1), while Benin has a higher GDP per capita and a lower agriculture share, which should facilitate tax revenue mobilisation. Although Togo has a higher trade openness and a better financial development index, this is not sufficient to explain the far higher tax over GDP ratio for Togo relative to Benin. While Benin's performance is growing relatively steadily, Togo's performance is more unstable. Except over the period 1992–2002, the ratios of tax and non-resource tax over GDP have been lower in Benin than in Togo (for more details see Caldeira and Rota-Graziosi, 2019).

Table 6.3 presents the three-stage estimation results. The first-stage estimation involves regressing countries' tax ratio on a vector of explanatory variables. All variables have the expected sign and are strongly significant at the 1 per cent level: per capita real GDP, trade openness, and financial development are positively associated, while the share of the agriculture sector is negatively and significantly correlated with non-resource tax revenues (Table 6.3 A). The level of development measured by the per capita real GDP has a significant effect on countries' non-resource tax ratio: a 1 per cent increase in real GDP per capita is associated with a 0.243 percentage point increase in non-resource tax revenue.

From that first stage, the Kumbhakar et al. (2014) model determines the maximum tax potential for each country, given its structural characteristics, estimates the persistent and time-varying inefficiencies, and computes the total inefficiency. On average in the period, SSA countries are at 53.96 per cent of their potential, so that they have room for about 46.04 per cent additional non-resource tax revenue (see Table 6.3 D). Knowing that, on average, countries collect 12.46 per cent of their GDP in non-resource tax revenue, *they would have raised 23.09 per cent of their GDP as non-resource tax revenue if they achieved their maximal capacity, given their characteristics*. The differences in total tax effort across SSA countries are mainly driven by persistent factors: the full sample average stands at 0.8005, 0.6724, and 0.5396 for the time-varying, the persistent, and the total tax effort, respectively. That room includes both tax administration (e.g. corrupt tax officers, tax evasion, inadequacy of tax administrations, tax exemptions, etc.) and tax policy. It is hard to determine whether persistent and variant inefficiencies are attributable to a tax gap or an administrative gap. If there is a tendency to associate the persistent inefficiencies with an administrative gap, and time-varying inefficiencies with a tax policy gap, significant administrative reforms may be implemented over time while tax policy may experience some persistence over time. In any case, the persistent factors – whether they come from administrative or tax policy inefficiencies – explain the major part of the inefficiencies.

Table 6.4 provides a country ranking over the period studied based on their total tax effort scores.[8] Lesotho, Burundi, and Malawi appear to be the

[8] Table 5 in Caldeira and Rota-Graziosi (2019) gives the tax effort over time for the full sample.

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TABLE 6.3 *Three-stage estimates of the tax effort in sub-Saharan African countries*

(A) First-stage random-effect estimates

Dependent variable	[1] NRTAX		[3] CIT	[4] PIT	[5] Goods and services
Log $GDPPC_{(-1)}$ (constant 2010 US$)	0.235***	(0.0331)	0.457***	0.240***	0.202***
		(0.0361)	(0.0552)	(0.0565)	(0.0725)
Agriculture, $value\text{-}added_{(-1)}$ (% of GDP)	−0.056***	(0.0141)	0.406***	0.456***	0.141*
		(0.0420)	(0.0625)	(0.0682)	(0.0847)
$Total\ trade_{(-1)}$ (% of GDP)	0.018***	(0.0042)	−0.0128	−0.440***	−1.018***
			(0.0121)	(0.0137)	(0.0173)
$Financial\ development_{(-1)}$	0.526***	(0.1238)	−0.0827***	−0.142***	0.0274
		(0.133)	(0.199)	(0.223)	(0.269)
Constant	0.622***	(0.247)	−4.452***	−2.260***	1.028
		(0.405)	(0.580)	(0.617)	(0.818)
Observations	1190	1.204	1.117	1.12	1.185
R-squared	0.1994	0.794	0.656	0.739	0.568
No. of countries	39	41	40	40	41
Country FE	yes	yes	yes	yes	yes

(B) Second stage, estimation of the time-varying tax inefficiency (stochastic frontier)

Log likelihood = 73.1133

Number of observations = 1,190
Wald $chi^2(1)$ = 430.30
Prob > chi^2 = 0.000

	Error	Coefficient	Standard error	z	P>|z|	[95% confidence interval]
frontier	one	0.238***	0.0114	20.74	0.000	0.2159
						0.2609
usigmas	_cons	−2.385***	0.0911	−26.16	0.000	−2.5637
						−2.2064

(*continued*)

TABLE 6.3 (*continued*)

	Error	Coefficient	Standard error	z	P>|z|	[95% confidence interval]
vsigma	_cons	−3.875***	0.1076	−36.02	0.000	−4.0862 −3.6645
(C) Third stage, estimation of time-varying tax inefficiency (stochastic frontier)						
Log likelihood = −543.512		**Number of observations = 1,190** **Wald chi²(1) = 1447.19** **Prob > chi² = 0.000**				
	Error	**Coefficient**	**Standard error**	**z**	**P>|z|**	**[95% confidence interval]**
frontier	one_te	0.509***	0.0133	38.04	0.000	0.482 0.535
usigmas	_cons	−1.009***	0.0584	−17.27	0.000	−1.124 −0.894
vsigma	_cons	−3.463***	0.1078	−32.12	0.000	−3.6747 −3.2520
(D) Summary of the estimation results						
	Observations	**Mean**	**Standard deviation**	**Min**	**Max**	
Time-varying tax effort	1,190	0.8005	0.1043	0.1689	0.9577	
Persistent tax effort	1,190	0.6724	0.1702	0.0444	0.9307	
Total tax effort	1,190	0.5396	0.1548	0.0218	0.8268	

Source: Authors' calculations.

Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. CIT, corporate income tax revenue; NRTA, non-resource tax revenue; PIT, personal income tax revenue.

TABLE 6.4 *Full sample tax effort-based ranking*

Country	Average tax effort	Rank	Country	Average tax effort	Rank
Lesotho	0.767	1	Swaziland	0.555	21
Burundi	0.758	2	Uganda	0.547	22
Malawi	0.72	3	Seychelles	0.545	23
Ethiopia	0.704	4	Mali	0.539	24
Togo	0.699	5	Cabo Verde	0.524	25
Gambia	0.695	6	Ghana	0.495	26
Senegal	0.669	7	Guinea	0.484	27
Mozambique	0.669	8	Cameroon	0.474	28
Namibia	0.658	9	South Africa	0.462	29
Kenya	0.658	10	Sierra Leone	0.446	30
Zambia	0.656	11	Mauritius	0.405	31
Côte d'Ivoire	0.652	12	Guinea-Bissau	0.384	32
Rwanda	0.649	13	Botswana	0.366	33
Benin	0.635	14	Congo Republic	0.331	34
Comoros	0.615	15	Gabon	0.274	35
Niger	0.6	16	Chad	0.274	36
Burkina Faso	0.598	17	Nigeria	0.257	37
Central African Republic	0.583	18	Angola	0.219	38
Madagascar	0.579	19	Equatorial Guinea	0.033	39
Tanzania	0.571	20			

Source: Authors' calculations.

most efficient countries, while Equatorial Guinea, Angola, and Nigeria record the lowest tax efforts. The tax revenue ratio as a percentage of GDP is high in efficient and low in non-efficient countries. At the same time, Angola and Equatorial Guinea have GDP per capita levels well above the average. Thus, Angola and Equatorial Guinea's poor performance are the result of the combination of low output and advantageous inputs. These two countries are rich in natural resources and the effort made to raise non-resource tax revenues appears to be very low. By contrast, Burundi manages to raise more revenues than the average while its characteristics are very unfavourable. Over the 2001–2015 subperiod, Togo emerges as the top performer, with a tax effort score of 0.78 in 2015 (rank 1).

The average tax effort score for the full sample – which amounts to around 54 per cent – remained on average relatively stable (Figure 6.2) during the period. Starting in the late 1980s for Benin and early 1990s for Togo, the performance in terms of tax effort for both countries has improved. The trend for Togo is more one of boom and bust, but the gap in performance between the

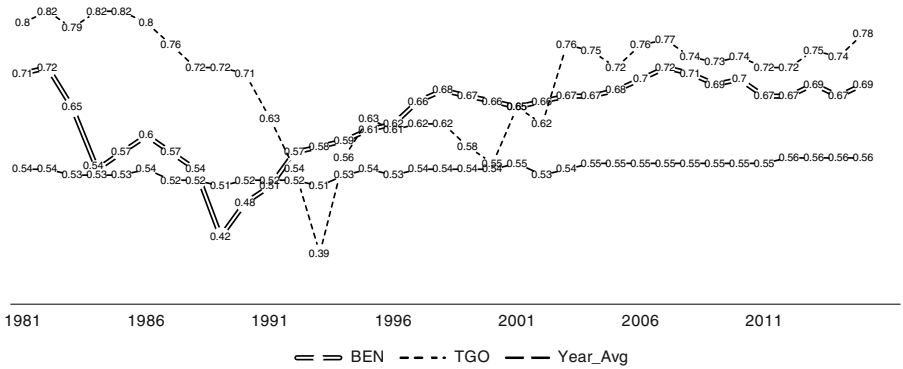

FIGURE 6.2 Tax performance over time
Source: Authors' calculations.

two countries stands around 6 percentage points. Togo has 9 percentage points more than Benin at the end of the period and ranks first among all countries. However, with a total tax effort level of 0.78 and 0.69 in 2015, Togo and Benin have not recovered their level of tax effort of the beginning of the period. Nigeria, Côte d'Ivoire, Cameroon, and Malawi also experienced an overall decline in performance during the period. Togo has experienced an increase in the last fifteen years (Figure 6.3). By contrast, Benin's tax effort has declined over the same period.

We extend the analysis by estimating the tax effort by type of tax: value-added tax (VAT), corporate income tax, personal income tax, trade tax, and excise (Table 6.5). These results should be interpreted with caution. Indeed, tax revenue determinants of the different taxes (inputs) may differ. At the same time, comparison would be complex if a different model were determined for estimating the tax effort for each type of tax. We therefore chose to maintain the same model.

The tax effort is heterogeneous according to the type of tax. In particular, Benin appears relatively better ranked in terms of VAT (rank 4) and corporate income tax (rank 13) than in terms of trade tax (rank 28), excise (rank 15), and personal income tax (rank 14). The tax effort for VAT is 0.686 and on trade tax 0.666, and only 0.344 and 0.396 on average for corporate income tax and personal income tax. The ranking in terms of Togo's performance is more homogeneous, but the values of the tax effort vary according to the type of tax: from 0.676 for trade tax to 0.504 for corporate income tax and only 0.452 for personal income tax. These results tend to corroborate those of Cui et al. (2016), which show an under-performance in terms of income tax relative to the performance in terms of trade tax in Benin.

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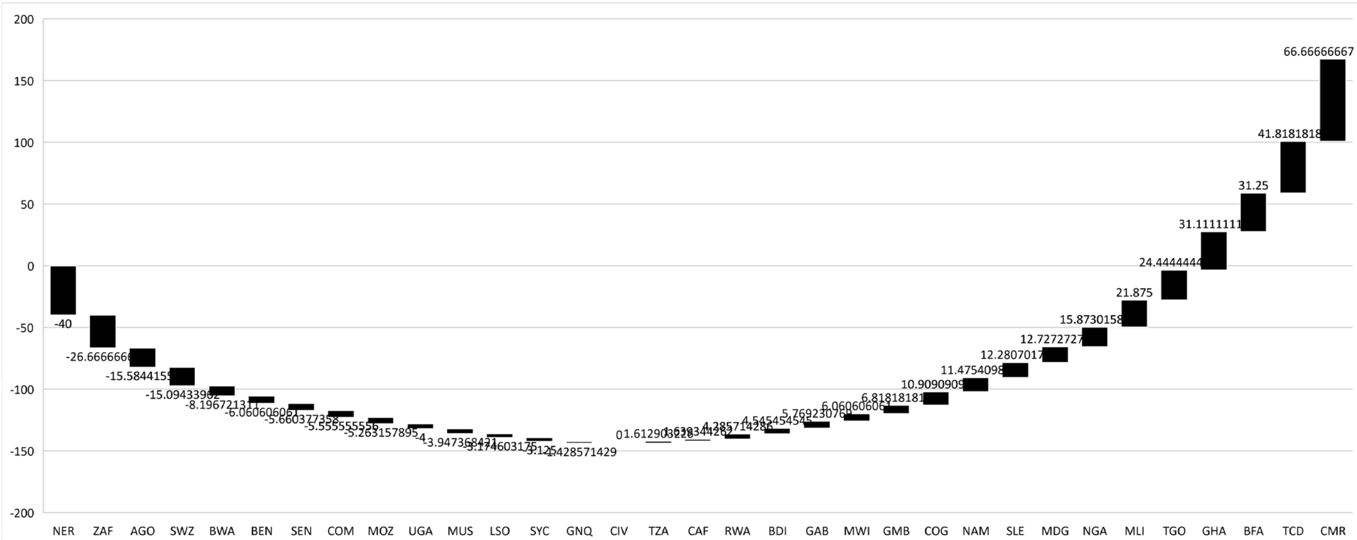

FIGURE 6.3 Growth rate of tax effort over the period 2000–2015
Source: Authors' calculations.

TABLE 6.5 *Tax effort by type of tax*

VAT	Tax effort	Rank	Corporate income tax	Tax effort	Rank	Personal income tax	Tax effort	Rank	Trade tax	Tax effort	Rank	Excise	Tax effort	Rank
Angola	NA	NA	Angola	NA	NA	Angola	NA	NA	Angola	0.683	5	Angola	NA	NA
Burundi	NA	NA	Burundi	0.712	2	Burundi	0.544	2	Burundi	0.663	31	Burundi	NA	NA
Benin	0.686	4	Benin	0.344	13	Benin	0.396	14	Benin	0.666	28	Benin	0.739	15
Burkina Faso	0.677	6	Burkina Faso	0.326	14	Burkina Faso	0.445	10	Burkina Faso	0.677	10	Burkina Faso	0.748	6
Botswana	0.634	12	Botswana	0.169	33	Botswana	0.14	35	Botswana	0.677	9	Botswana	NA	NA
Central African Rep	0.469	27	Central African Rep	0.184	31	Central African Rep	0.456	6	Central African Rep	0.657	37	Central African Rep	0.739	16
Côte d'Ivoire	0.479	25	Côte d'Ivoire	0.24	27	Côte d'Ivoire	0.339	22	Côte d'Ivoire	0.673	15	Côte d'Ivoire	0.708	28
Cameroon	0.664	9	Cameroon	0.279	22	Cameroon	0.315	23	Cameroon	0.669	25	Cameroon	0.746	7
Congo, Dem. Rep.	NA	NA	Congo, Dem. Rep.	NA	NA	Congo, Dem. Rep.	NA	NA	Congo, Dem. Rep.	NA	NA	Congo, Dem. Rep.	NA	NA
Congo, Rep.	NA	NA	Congo, Rep.	0.199	29	Congo, Rep.	0.197	32	Congo, Rep.	0.662	33	Congo, Rep.	NA	NA
Comoros	0.446	30	Comoros	0.283	20	Comoros	0.208	30	Comoros	0.671	19	Comoros	0.738	17
Cabo Verde	0.709	3	Cabo Verde	0.282	21	Cabo Verde	0.299	26	Cabo Verde	0.683	4	Cabo Verde	NA	NA
Ethiopia	0.61	15	Ethiopia	0.666	4	Ethiopia	0.273	28	Ethiopia	0.67	21	Ethiopia	0.734	20
Gabon	0.476	26	Gabon	0.177	32	Gabon	0.142	34	Gabon	0.697	2	Gabon	NA	NA
Ghana	0.571	21	Ghana	0.296	19	Ghana	0.39	18	Ghana	0.678	7	Ghana	0.738	18
Guinea	0.569	22	Guinea	0.105	37	Guinea	0.186	33	Guinea	0.663	32	Guinea	0.731	22
Gambia, The	0.669	8	Gambia, The	0.574	5	Gambia, The	0.446	9	Gambia, The	0.68	6	Gambia, The	0.723	25
Guinea-Bissau	0.462	29	Guinea-Bissau	0.157	34	Guinea-Bissau	0.202	31	Guinea-Bissau	0.67	22	Guinea-Bissau	0.727	24
Equatorial Guinea	0.236	33	Equatorial Guinea	0.031	38	Equatorial Guinea	0.018	38	Equatorial Guinea	0.651	39	Equatorial Guinea	NA	NA
Kenya	0.595	17	Kenya	0.729	1	Kenya	0.519	3	Kenya	0.667	27	Kenya	0.748	5
Lesotho	NA	NA	Lesotho	0.267	24	Lesotho	0.394	16	Lesotho	0.726	1	Lesotho	NA	NA
Madagascar	0.587	18	Madagascar	0.301	18	Madagascar	0.307	24	Madagascar	0.672	17	Madagascar	0.744	12

Mali	0.643	11	Mali	0.271	23	Mali	0.348	21	Mali	0.675	12	Mali	0.703	29
Mozambique	0.679	5	Mozambique	0.478	7	Mozambique	0.449	8	Mozambique	0.669	24	Mozambique	0.741	14
Mauritius	0.318	31	Mauritius	0.141	35	Mauritius	0.136	36	Mauritius	0.666	29	Mauritius	0.662	30
Malawi	0.608	16	Malawi	0.69	3	Malawi	0.546	1	Malawi	0.667	26	Malawi	0.745	10
Namibia	0.677	7	Namibia	0.35	12	Namibia	0.426	11	Namibia	0.684	3	Namibia	0.728	23
Niger	0.581	19	Niger	0.386	11	Niger	0.393	17	Niger	0.671	18	Niger	0.733	21
Nigeria	0.315	32	Nigeria	0.265	25	Nigeria	0.125	37	Nigeria	0.669	23	Nigeria	0.71	27
Rwanda	0.624	14	Rwanda	0.435	10	Rwanda	0.473	5	Rwanda	0.66	36	Rwanda	0.746	8
Senegal	0.715	2	Senegal	0.303	17	Senegal	0.36	20	Senegal	0.675	13	Senegal	0.742	13
Sierra Leone	0.463	28	Sierra Leone	0.26	26	Sierra Leone	0.42	13	Sierra Leone	0.664	30	Sierra Leone	0.737	19
Sao Tome and Principe	NA	NA	Sao Tome and Principe	NA	NA	Sao Tome and Principe	NA	NA	Sao Tome and Principe	NA	NA	Sao Tome and Principe	NA	NA
Swaziland	0.646	10	Swaziland	0.212	28	Swaziland	0.305	25	Swaziland	0.673	16	Swaziland	0.712	26
Seychelles	0.749	1	Seychelles	0.304	16	Seychelles	0.298	27	Seychelles	0.677	8	Seychelles	0.756	1
Chad	NA	NA	Chad	0.141	36	Chad	0.362	19	Chad	0.67	20	Chad	NA	NA
Togo	NA	NA	Togo	0.504	6	Togo	0.452	7	Togo	0.676	11	Togo	0.745	9
Tanzania	0.553	23	Tanzania	0.323	15	Tanzania	0.423	12	Tanzania	0.662	35	Tanzania	0.744	11
Uganda	0.581	20	Uganda	0.19	30	Uganda	0.213	29	Uganda	0.674	14	Uganda	0.748	4
South Africa	0.532	24	South Africa	0.456	9	South Africa	0.394	15	South Africa	0.662	34	South Africa	0.749	3
Zambia	0.627	13	Zambia	0.46	8	Zambia	0.48	4	Zambia	0.657	38	Zambia	0.75	2
Zimbabwe	NA	NA	Zimbabwe	NA	NA	Zimbabwe	NA	NA	Zimbabwe	NA	NA	Zimbabwe	NA	NA

NA, not available.

Source: Authors' calculations.

III THE DETERMINANTS OF TAX EFFORT: A LOGISTIC REGRESSION ANALYSIS

Using a logistic regression, we now study the effect of some variables – natural resources, aid, institutional quality, political regime, and political stability – on tax effort.

As a first step of the analysis we present some general descriptive statistics. We can observe that non-resource-rich countries and non-fuel exporters have higher tax effort scores than their resource-rich peers. This may support the view that governments in resource-rich countries have less incentive to mobilise tax revenues when they have resource rent. Similarly, landlocked countries make a more intense tax effort and countries that are considered as offshore financial centres have low performance in terms of tax effort. East African Community (EAC) and WAEMU member countries appear to have better performance than Communauté Economique et Monétaire d'Afrique Centrale (CEMAC) and South African Community (SAC) countries. If we look at the evolution of tax effort in the WAEMU and CEMAC countries, it appears that WAEMU countries are on average better performing, which lends some support to the arguments in favour of regional harmonisation (of both customs and domestic tax policies).

Benin has little room to increase tax revenues unless it addresses the reasons why it is below weak taxable capacity by conducting institutional reforms to expand its tax revenue potential. Using the International Country Risk Guide (ICRG) database and following Frankel et al. (2013), we compute an index of institutional quality based on an average of four normalised variables: investment profile, corruption, law and order, and bureaucratic quality. Higher values of the index are associated with better economic and political institutions that should favour tax revenue collection.

In order to study rigorously the determinants of tax effort, we carry out an econometric analysis to complement the previous statistical analysis. Based on an international comparison, we examine the effect of some variables on tax effort scores. Our focus here is on the effect of natural resources, official development assistance (ODA), transparency, corruption and accountability (CPIA indicator), and the political regime and stability.

The analysis of the factors explaining the level of tax effort is based on a logistic regression. Tax effort scores range from 0 to 1, the most efficient countries having the highest scores. The ranking is grouped in quartiles according to the score obtained: we have four classes, from Q_1 to Q_4. Thus, the observations with the lowest scores belong to the first quartile, while the observations with the highest scores are in the fourth quartile. These quartiles are considered as the dependent variable. Using quartiles allows us to estimate the effects associated with each group of countries.

As the dependent variable is thus an ordinal variable, we use a mixed-effects ordered logistic model (see Liu and Hedeker, 2006; Rabe-Hesketh and Skrondal, 2012). This model is an ordered logistic regression containing both fixed and random effects. The identification strategy makes it possible to control for the

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characteristics of countries that can affect the evolution of efficiency over time. We use a two-tier model. For M countries, the cumulative probability that a Y_{it} observation belongs to an efficiency quartile greater than q is given by:

$$Pr\left(Y_{it} > q \mid X_{it}, \varphi_q, u_i\right) = H\left(X_{it}\beta + Z_{it}u_i - \varphi_q\right)$$

with X_{it} a set of covariates, φ_q a set of cut points,[9] and u_i a set of random effects (i=1,…,M country, each i has a given number of occurrences in time t=1,…,n occurrences). H() is the cumulative logistic distribution function that represents the cumulative probability. The X_{it} vector of dimension 1*p represents covariates for fixed effects with β coefficients. The 1*q vectors of Z_{it} are covariates corresponding to random effects and can be used to represent intercepts and random coefficients.

While the estimation of tax effort scores requires focusing on structural supply variables, we now consider the potential effect of demand factors on the estimated level of tax effort: natural resource rent, aid, institutional quality (transparency, corruption, and accountability), political regime, and political stability.

The effect of natural resource rent on tax revenue ratio is widely evidenced in the literature. Natural resource endowment is associated with lower non-resource tax revenue, suggesting a natural resource curse (Sachs and Warner, 2001; Eltony, 2002; Melou et al., 2017). In particular, during commodity price upswings, governments in resource-rich countries have less incentive to mobilise tax revenues so that resource rent crowds out tax revenue. We consider in our model total natural resource rents (percentage of GDP) as the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents.[10]

ODA can also modify government behaviour (Bahl, 2000; Bird and Smart, 2002). The literature highlights several effects. Among the most documented, the flypaper effect is an empirical regularity: any increase in transfers/aid leads to greater public spending than an equivalent rise in the private revenue of the population (Hines and Thaler, 1995). In a context of informational asymmetries, aid challenges the fiscal discipline of recipient governments by raising a moral hazard problem (Pisauro, 2001; Kornai et al., 2003): it can be perceived as a kind of windfall resource, which crowds out own-source revenue by reducing the willingness of governments to improve their tax effort. More broadly, aid dependency seems to erode governments' accountability, a prerequisite for the quality of public expenditure and taxpayers' voluntary compliance. Hence, we consider in our model 'Net ODA' (from the World Bank). This consists of 'disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC

[9] The cut-off points φ are φ1, φ2, φ3, because we have four efficiency groups (quartiles).
[10] World Bank estimates based on sources and methods described in Lange et al. (2018).

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countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients'.[11]

Institutional quality may also play a key role in mobilising resources. Indeed, it can improve tax policies and administrations' ability to collect revenues, as well as taxpayers' voluntary compliance. In particular, the degree of transparency, accountability, and corruption in the public sector determines the extent to which citizens can hold the executive accountable for its use of funds, and for the results of its decisions and actions. It also determines the extent to which public employees within the executive are required to account for administrative decisions, use of resources, and the final results obtained. Using the 'CPIA transparency, accountability, and corruption in the public sector rating' variable makes it possible to account for these potential effects. The three main dimensions assessed in that indicator are 'the accountability of the executive to oversight institutions and of public employees for their performance, access of civil society to information on public affairs, and state capture by narrow vested interests' (World Bank, 2009, p. 301).

Beyond the institutional aspects, the political regime in place may explain the level of tax effort. A growing body of literature suggests that political regime type matters in determining taxation. Garcia and Von Haldenwang (2016) identify three different causal mechanisms that affect the relation between regime type and taxation: economic growth, redistribution, and legitimacy. First, based on a positive link between democratic rule and economic growth, democracy should lead to higher tax collection because of growing taxable income. Second, based on the median voter theorem (Milanovic, 2000; Acemoglu and Robinson, 2006), the expansion of suffrage induced by democracy should lead to higher levels of redistribution and more public services, which may impact the level of taxation. Third, tax contractualism emphasises the importance of legitimacy and credibility in bargaining processes and tax compliance (Moore, 2008; Timmons, 2005; Levi and Sacks, 2007; Bates and Lien, 1985; Mahdavi, 2008). In this context, democracy should lead to higher tax collection, as taxpayers can be more confident that fiscal resources are spent for the common good and that the distribution of the tax burden is fair. Empirical research on the relationship of political regimes to taxation yields mixed results and it appears that there is no linear trend in favour of democracy. To test for these potential effects, we use a modified version of the 'Polity' variable proposed by the Center for Systemic Peace that allows the use of a regime measure in time-series analyses. This variable captures the political regime authority spectrum on a 21-point scale ranging from –10 (hereditary monarchy) to +10 (consolidated democracy).[12]

[11] It includes loans with a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent). World Bank DataBank, https://databank.worldbank.org/metadataglossary/sustainable-development-goals-(sdgs)/series/DT.ODA.ODAT.CD1.

[12] The Polity scores can also be converted into regime categories in a suggested three-part categorisation of 'autocracies' (–10 to –6), 'anocracies' (–5 to +5 and three special values: –66, –77, and –88), and 'democracies' (+6 to +10). The performance score is from 0 to 100. The highest score reflects the best situation.

TABLE 6.6 *Logistic regression results*

Quartiles of tax effort	(I)	(II)	(III)	(IV)	(V)	(VI)
ODA	−0.001***					−0.001*
	(0.000)					(0.000)
Natural resource rent		0.048				−0.003
		(0.017)				(0.032)
CPIA			1.626***			1.030*
			(0.203)			(0.770)
Political regime				−0.027		−0.060**
				(0.022)		(0.026)
Political Stability					0.617***	−0.207
					(0.160)	(0.386)
Cut1	−2.351***	−1.501***	0.418	−1.891***	−1.833***	1.549
	(0.305)	(0.263)	(0.966)	(0.489)	(0.258)	(2.596)
Cut2	−0.554	0.176	2.316**	−0.064	−0.106	3.696
	(0.296)	(0.258)	(0.972)	(0.481)	(0.251)	(2.613)
Cut3	0.567*	1.286***	3.769***	0.821*	1.093***	5.222**
	(0.299)	(0.262)	(0.981)	(0.484)	(0.255)	(2.620)
Var (Const)	1.475*	1.474***	1.454***	1.465***	1.453***	1.515**
	(1.097)	(0.203)	(0260)	(0.345)	(0.212)	(0.842)
Observations	851	845	684	288	864	216
Number of groups	24	24	19	8	24	6
Log-likelihood	−779.05	−795.29	−662.16	−261.35	−801.82	−223.43

Source: Authors' calculations.
* Coefficient significant at 10% level.

Tax effort may also be influenced by political instability. An important literature shows that political stability determines the level of taxation (Cukierman et al., 1992; Aizenmana and Jinjarak, 2008; Melo, 2011). A rise in the level of political instability generates a decrease in the resources available and public expenditure in the next period. Moreover, the risk of radical policy changes in the future can have a detrimental effect on the tax behaviour of governments and on tax compliance. We include in the empirical analysis a variable from the World Bank that measures 'perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. The estimate gives the country's score on the aggregate indicator, in units of a standard normal distribution, i.e. ranging from −2.5 to 2.5'.[13]

Table 6.6 presents the results of the regression of the logistic model. We regress successively each of the interest variables (columns 1 to 5) and then

[13] World Bank DataBank, https://databank.worldbank.org/metadataglossary/worldwide-governance-indicators/series/PV.EST.

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all these variables at the same time (column 6). Aid is associated with a lower probability of belonging to a quartile of high tax effort, while institutional quality (measured by the CPIA index) increases the probability of belonging to an efficient quartile in terms of tax effort. If the effect of the political system is not clear, political stability is strongly and positively associated with a greater likelihood of having a high tax burden. When the model is regressed across all variables, the effects of aid, institutional quality, and the political system appear to be significant.

IV TAX POLICY OR REVENUE ADMINISTRATION REFORMS

In this section, we review some tax policy and tax administrative issues in Benin, and suggest some reforms to improve tax mobilisation.

A Tax Policy and Tax Expenditures

The Beninese government sets the tax policy under the control of the legislative authority and following the WAEMU tax Regulation (*Règlement* in French), Directives, or Decisions.[14] WAEMU tax Directives define the rates and bases of the main taxes: VAT, corporate income tax, excises, portfolio incomes, and so on. Therefore, WAEMU member countries share a similar set of tax laws, which are encompassed in their respective national tax codes. However, tax effort analysis highlights the leading role of Senegal, which belongs to WAEMU too. Senegal displays a tax effort above 70 per cent, meaning a tax gap of less than 30 per cent of potential tax revenue over the most recent period (2015).

A potential explanation of this discrepancy between Benin and Senegal (or Togo) is a derogatory tax regime, such as the Investment Code (IC). Indeed, all the WAEMU countries, like almost developing countries, provide some tax incentives through their IC (or Act). Such a policy, sometimes suggested by the World Bank, aims to attract foreign direct investment. The main issue is in the details of these incentive schemes, which may also reflect the effects of lobbying.

The comparison of the Beninese IC, enacted in 1990 and modified in 1998 and 2008, with the Togolese one (in force since 2012) yields the conclusion of a greater generosity towards investors in Benin. Indeed, the Beninese IC offers a complete corporate income tax exemption over a period from five to nine years (even fifteen years if the investment is located in remote areas). Moreover, tax advantages and their duration increase with the investment

[14] These three regional legal texts do not have the same power of enforcement. While the WAEMU Regulation has immediate force of law and must be transferred into national legislation, WAEMU Directives and Decisions can be interpreted when they are integrated into the national laws.

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amount. Meanwhile, the Togolese IC does not provide such a corporate income tax break, but only a 50 per cent rebate on corporate income tax owed. Moreover, this advantage is limited to five years and does not apply to some sectors, such as mobile phone companies, banks, insurance companies, retailers, or firms in charge of seaport and airport infrastructure. Another noticeable difference between the Beninese IC and the Togolese one concerns the importation of second-hand materials necessary for projects: Togo raises a unique 5 per cent tax for VAT and duty purposes, while Benin provides a complete exemption.

If the efficiency of such incentives in attracting foreign direct investment remains uncertain (see Van Parys and James, 2010), tax revenue losses captured through tax expenditure assessment are more obvious.[15] Consequently, despite similar tax laws between Benin and Togo, tax expenditures such as these provided in ICs may differ significantly, partly explaining the gap in tax effort between these two countries. Yearly tax expenditure assessments and publications contained in the appendices to finance laws, in accordance with the 2015 WAEMU Decision, would contribute to streamlining these incentives, and improving the tax effort by reducing the policy gap.

B Tariff Policy and Informal Trade with Nigeria

Beyond tax policy, an important component for Benin is the tariff policy, which is determined by the WAEMU Commission and, officially since 2015, by the Economic Community of West African States (ECOWAS) Commission. ECOWAS is a customs union with fifteen members.[16] The ECOWAS Common External Tariff implementation is still ongoing, but it will impact Benin's tax revenue, given the weight of the transit activity in this country. Tax revenue collected at the border represented almost half of total tax revenue in 2015: 4.41 per cent of GDP for trade taxes and 2.64 per cent of GDP for VAT collected at the border.

A large part of Beninese imports is not for the domestic market, but for the Nigerian one, and for landlocked countries (Burkina Faso, Mali, and Niger). Indeed, Nigeria has developed a protectionist trade policy by banning the importation of some goods (e.g. poultry meat, beer, used clothes, tyres, used

[15] Anderson (2008) defines tax expenditures as 'provisions of tax law, regulation or practices that reduce or postpone revenue for a comparatively narrow population of taxpayers relative to a benchmark tax'. The assessment of tax expenditures usually follows such a revenue loss approach, which involves assuming unchanged (investment or consumption) behaviour: the investor (consumer) would have invested (consumed) the same amount with or without the derogatory tax regime (see OECD, 2010). Such an assumption may induce an overestimation of tax expenditure.

[16] In addition to the eight WAEMU members, ECOWAS also includes Cabo Verde, Gambia, Ghana, Liberia, Nigeria, and Sierra Leone.

cars, etc.) or raising high tariff rates on some other goods (e.g. 50 per cent on rice or sugar). This trade policy fuels smuggling activity in Benin and Togo. The former manages to extract significant tax revenue from this activity, which is estimated at 14 per cent of total tax revenue, or equivalent to 2.4 per cent of GDP in 2008 (see Golub, 2012; IMF, 2012). Despite a geographical advantage for Benin given the common border with Nigeria, there is competition between Benin and Togo to attract this illegal transit activity. This competition may seriously limit efforts to improve domestic revenue mobilisation, at least at the border. For instance, despite or because of the WAEMU Common External Tariff in place in Benin and Togo since 2000, competition takes place on the reported value of imported goods for the Nigerian market. Such competition does not respect the World Trade Organization transaction value principle. Hence, special attention should be given to tariff policy in Benin, taking into account the existence of the informal trade with Nigeria.

C Administration Capacity

Tax effort is closely related to the tax and customs administration capacity. Benin still has a 'classic' organisation of these administrations, while Togo implemented a SARA in 2014. While it may be too early to assess the efficiency of such a reform in this particular case, Ebeke et al. (2015) found a significant positive impact of SARA on domestic revenue mobilisation: an increase by 4 percentage points of GDP. A natural question, then, would be whether Benin should switch to a revenue agency.

First implemented in Africa by Ghana in 1985, the SARA is a drastic reform, which can be understood as a strategic delegation of taxation power to an autonomous agent. The autonomy, which differs significantly across countries, is a signal of a more credible audit policy, since control occurs, at least theoretically, without any political interference. Two main advantages of SARAs are advanced in the literature. First, SARAs involve the merger of tax and customs administrations in order to (1) exploit synergies, in particular for VAT on imports (Keen, 2008); and (2) save costs by combining operational functions in tax collections (World Bank, 2010). The second advantage is human resource management. Recruitment, promotion, and dismissal do not have to respect civil service rules, allowing a number of flexibilities, such as higher wages (Fjeldstadt and Moore, 2009; Moore, 2014). Table 6.7 shows preliminary evidence of a positive correlation between public-sector wages and salaries[17] and estimated tax effort.

Switching to a SARA is a radical reform and the transition may be costly and risky, as it involves the replacement of a significant share of the staff. Alternative reforms may focus on the payment and incentive mechanisms in

[17] Data concerning civil service wage bill come from the Banque Centrale des Etats d'Afrique de l'Ouest (BCEAO) database: https://edenpub.bceao.int/index.php.

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TABLE 6.7 *Correlation between civil service wage bill and tax effort*

	[1]	[2]	[3]	[4]
Payroll [1]	1.0000			
Total tax effort [2]	0.1766*	1.0000		
Time-varying tax effort [3]	0.1473*	0.9697*	1.0000	
Persistent tax effort [4]	0.1423*	0.3395*	0.1017	1.0000

Source: Authors' calculations.

place in the Beninese tax and customs administrations. In 2016, the Beninese tax administration numbered less than 500 staff[18] (there are more than 1,500 in Togo and there are 1,200 in Senegal). These staff receive several premiums in addition to their wage: *prime de rendement*, *prime d'incitation*, *prime d'impulsion*, and potentially a risk premium. A large part of these premiums remains collective, reducing their incentive dimension. Several empirical studies have highlighted the advantage of reviewing such incentives. For instance, Khan et al. (2016) show that a reward scheme based on collected revenue significantly improved property tax revenue in Pakistan. However, they emphasise also that the revenue gain resulted from a small number of properties, the values of which were reassessed, and that a risk of higher bribes emerged with the increase in collectors' bargaining power because of this new incentive mechanism. Thus, the introduction of individual performance contracts may be necessary, but is not sufficient to reduce the risk of corruption. As with a SARA, this mechanism should be complemented by extensive and effective monitoring (see Fjeldstad, 2002).

In 2017, Benin carried out a reform of its tax administration through a significant reorganisation,[19] which follows the segmentation approach of taxpayer population. It introduced a risk analysis for its audit policy and human management based on results. The details of this reform are unknown and the previously described incentive mechanisms seem to remain.

The 2017 tax administration reform also established a tax policy unit. This unit is in charge of defining the tax policy, forecasting expected tax revenue and the effect of tax reforms, and assessing tax expenditure. If the creation of a tax policy unit is an improvement in designing the Beninese tax system, the location of this unit inside the tax administration itself may seriously limit the efficiency of such a reform. First, it reflects a common inconsistency in French-speaking countries, and even in France, in which the tax administration not only collects taxes, but also designs the tax policy. Moreover, given the role of the tax policy unit in forecasting tax revenue,

[18] Data are not available for customs administrations.
[19] Decree N°3005/MEF/DC/SGM/DGI/SP.

the tax administration seems to have complete control over the goals to be achieved in terms of tax revenue, and the bonuses to be distributed to its staff. Second, customs remains an important tax collector and should be included in any tax reform and tax expenditure assessment. A natural location of the tax policy unit would have been 'above' both revenue administrations, headed by the special tax adviser of the Ministry of Finance. There is a need to clarify the role of each stakeholder: the revenue authorities, which collect taxes, and the Ministry of Finance, which designs the tax policy, with parliamentary control.

V CONCLUSION

Based on a large database covering forty-one SSA countries and the period 1980–2015, we analysed the effort by Benin to raise non-resource tax revenue in light of its structural characteristics. The stochastic frontier analysis, by comparing the non-resource tax-to-GDP ratio in Benin with its peers, identified whether Benin was away from the tax frontier: the tax effort in Benin remained relatively stable during the period, with an average of 65.1 per cent over the period and a rank of thirteen out of forty-two countries. A tax effort of 65.1 per cent means that the level of non-resource tax revenue is at 34.9 per cent of the country's maximum capacity. Knowing that, on average, Benin collects 11.14 per cent of its GDP in non-resource tax revenue and is at 65.1 per cent of its capacity, it would have raised 17.11 per cent of its GDP as non-resource tax revenue if it had used all its potential, given its characteristics. Hence, Benin has little room – insufficient to reach the WAEMU criterion of 20 per cent of tax revenue to GDP – to increase tax revenues, unless it addresses the reasons for the weak taxable capacity and conducts institutional reforms to expand its tax revenue potential.

In order to study rigorously the determinants of tax effort, an econometric analysis then complemented the previous statistical analysis. Based on an international comparison, we examined the effect of natural resources, ODA, transparency, corruption and accountability (CPIA indicator), and the political regime and stability on tax effort scores. We found that aid is associated with a lower probability of belonging to a quartile of high tax effort, while institutional quality (measured by the CPIA index) seems to increase the probability of belonging to an efficient quartile in terms of tax effort. Political stability appears to be strongly and positively associated with a greater likelihood of having a high tax burden.

Analysing potential policy and administrative sources of these tax gaps, we shed light on the human resource policy of the tax administration and the remuneration mechanisms, which may be obsolete. The payment and incentive mechanisms in place in Beninese tax and customs administrations should be reviewed and associated with extensive and effective monitoring to improve tax effort and limit the risks of corruption. The 2017 tax administration reform may improve tax revenue through a more efficient organisation of

departments and divisions. However, it also raises a critical issue of providing the decision-making power in tax policy to the tax administration through the creation of a tax policy unit.

APPENDIX

The countries included in the study are Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Ethiopia, Gabon, The Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, Uganda, Zambia, and Zimbabwe.

Table 6.A.1 reports the definition and sources of data used.

TABLE 6.A.1 *Data sources and definitions*

Variables	Definition	Sources
Total non-resource tax (% GDP)	Total tax revenues excluding resource rent	Mansour (2015)
Total natural resource rent (% GDP)	Sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents over GDP	World Bank World Development Indicators (WDI), https://databank.worldbank.org/source/world-development-indicators
GDP per capita (constant 2010 US$)	Volume of imports and exports divided by GDP	
Total trade (% of GDP)	Volume of imports and exports over GDP	
Agriculture, value-added (% GDP)	Net output of forestry, hunting, and fishing, as well as cultivation of crops and livestock production, after adding up all outputs and subtracting intermediate inputs, divided by GDP	
Financial development index	Aggregate of nine indices that summarise how developed financial institutions and financial markets are in terms of their depth, access, and efficiency	Svirydzenka (2016)

Source: Authors' calculations.

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