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Tax Mobilization in Sub-Saharan Africa: The Impact of Tax and Business Law Reforms.

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Abstract: This paper contributes to measuring the influence of business (and tax) law reforms on sub-Saharan African countries' tax mobilization ability. Relying on a new business law reform indicator, our results validate the significant impact of corporate law modernization on governmental revenue, and unearth a complementary effect between business and tax law reforms.

Keywords: Tax revenue mobilization, Business law reform, Tax reform.

JEL classification: H20, O17.

1. Introduction

Revenue mobilization in developing countries ranks usually on top of the agenda of international summits on development. In particular, in Sub-Saharan African countries (SSA), tax-revenue ratios remain chronically low, while these countries have a considerable need of domestic resources to finance poverty reduction and develop their infrastructures. The most recent empirical contributions trying to unearth the determinants of this incapacity to increase tax-revenue ratios point towards structural as well as institutional factors.[2] In this context it is noteworthy to highlight Keen and Lockwood (2010)'s findings of a significant positive relationship between VAT adoption and government revenue, except for SSA countries. More generally, a positive impact of institutional quality, in interaction with other structural factors like natural resources, has been documented for SSA countries (e.g. Botlhole et al 2012). Our paper contributes to this empirical literature by (i) using a new indicator of a business law reform, and testing its impact on tax revenue and total revenue, for a large panel of SSA

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[2] See for instance, Gupta 2007; Keen and Mansour, 2010; Botlhole et al 2012; Keen and Lockwood, 2010; Thomas and Treviño 2013.

countries; and (ii) we account for potential endogeneity issues by relying on instrumental variables techniques using internal instruments (Lewbel, 2012).

2. Data and institutional background

Our analysis covers a large panel of 41 SSA countries over the period 1990 to 2013, making it one of the largest coverage so far for this type of studies.[3] We use alternatively as dependent variables tax revenue and total government revenue, both excluding grants, and expressed as a percentage of GDP. The difference between these two indicators essentially comes from income from property which is crucial for countries with oil or mining rents.

Our variable of business law reform is constructed so as to reflect fundamental institutional changes and avoid the usual distinction between Common law vs Civil (Napoleonic) law countries. Indeed, during the 1990s and 2000s decades, a lot of African countries which had inherited legal systems through colonialism undertook modernization of their business law. The OHADA[4] process is the most prominent. It associates 17 French-speaking countries in establishing harmonized acts applicable in every jurisdiction directly, mainly since 1997. But other countries (like Kenya, Rwanda, South-Africa…) also recently updated their Corporate law and instituted new rules to secure and modernize the legal environment for business (Astier 2012).

Our indicator variable captures the year of a fundamental change in the national business law. Identification of such a change is based on two sources: (i) the "Doing Business Law Library"[5] supplemented by (ii) Country Reports of KPMG Africa. While one shortcoming of our indicator is its binary nature, we thereby circumvent the criticism of the "law and development" literature, which argues that a bias may result from the use of perception indicators like the "rule of laws index" (Arndt and Omar 2006; Siems, 2011; Voigt, 2012).

Business law reforms have an impact on tax mobilization through several channels. Firstly, reforms may have the ambition to increase the size of the formal sector to the detriment of the informal, and hard to tax, sector. In this direct channel, often considered naïve, the informal sector is considered as a disease that should be reduced as much as possible. Secondly, and more importantly, business law reforms may permeate the informal sector by useful legal

[3] In a similar study, Gupta et al (2007) use a panel of 44 countries for the group of all low income countries.
[4] French acronym for "Organisation Pour l'Harmonisation en Afrique du Droit des Affaires".
[5] URL: www.doingbusiness.org/law-library : exhaustive collection of business laws and regulations (commercial and companies' laws, civil codes, bankruptcy and collateral laws, securities laws…).

vehicles, such as arbitration or Economic Interest Group (EIG), in order to increase the predictability of transactions while limiting government abuse (Moore-Dickerson, 2011). Finally, the essential goal of business reforms is to attract and secure (possibly foreign) investments, and hence indirectly increasing revenue mobilization.

Tax reforms are the natural way to mobilize tax revenues. In our empirical framework, we also take account of VAT adoption, which has been the main tax reform in SSA during the last decades (Fossat and Bua, 2013; Kloeden, 2011).

Finally, we control for a number of other structural variables, considered as standard determinants of tax revenue mobilization: income per capita; the share of agriculture in GDP, as a proxy of the informal sector size; trade openness; conflict; official development aid; and an indicator of natural resource rents. All definitions and sources of data are detailed in the Appendix (Table 2).

3. Empirical Methodology

We rely on the following specification, in order to measure the impact of business law reforms on tax mobilization:

$$y_{it} = \alpha + \beta_1 BLREF_{it} + \beta_2 VAT_{it} + X_{it}\beta' + \mu_i + \gamma_t + \varepsilon_{it}\ , \qquad (1)$$

where $y_{it}(= TRGDP\ or\ REVGDP)$ is the ratio of tax revenue (or total revenue excluding grants) to GDP, in country *i* during the period t. $BLREF_{it}$ is our indicator variable of business law reforms, and VAT_{it} accounts for tax reforms. X_{it} is a set of structural variables, listed in the previous section. Finally, μ_i denotes country specific, time invariant unobservables, γ_t is a time-effect and ε_{it} is the disturbance term.

A major issue we are facing comes from the endogenous nature of our two variables of interest $BLREF_{it}$ and VAT_{it}. To address this problem, in the absence of a valid external instrument satisfying the exclusion restriction, we rely on Lewbel (2012)'s internal instrumental approach, using higher order moment restrictions to tackle endogeneity. Identification is achieved through a two-stage procedure. In the first stage we regress $BLREF_{it}$ (VAT_{it}), resp. their interactions against X_{it}. We then use the mean-centered deviation of the vector of independent variables, X_{it}

interacted with the residual from the first-stage regression, as the identifying instruments.[6] Critical to the identification process is that errors obtained in the first stage are heteroscedastic. We rely on a Breusch-Pagan procedure to test this.

4. Results

In Tables 1 and 3, estimation results of specification (1) are presented, using panel data fixed effects techniques in the former table and adding instrumental variables in the latter. Each table is divided in two panels: a left panel relying on Tax Revenue as a percentage of GDP (TRGDP) as the dependent variable, and a right panel using Total Government Revenue as a percentage of GDP (REVGDP).

All control variables display expected signs. GDP per Capita (LNGDPCAP) is positive and significant, as the capacity to mobilize taxes goes hand in hand with economic development. Similarly, the coefficient of the Share of Agricultural Value Added in GDP (AGRICVA) has a negative and significant sign in all regressions, highlighting the difficulty in collecting taxes in sectors more prone to be informal. Development Aid (ODA) does not contribute to any of our dependent variables, neither positively nor negatively, as debated in the literature (Gupta 2007). Trade Openness (OPEN) and the Conflict Dummy (CONF) display changing significance according to the dependent variable. Property revenue, which is the main difference between the two dependent variables, is key here.

The main variable of interest, BLREF positively affects tax and governmental revenues in most regressions. In column Ia (Ib), results suggest that countries having undergone a business law reform will increase their tax revenue share (total governmental revenue share) by 0.9 (1.4) percentage points (compared to a median value of 13 (17) per cent). In column IIa, the effect remains positive (and is even reinforced in column IIb) when taking account of a possible interaction with the presence of natural resources (NRR). When considering REVGDP, only the interaction is significant, whereas the level effect of BLREF becomes marginally insignificant. Finally, columns IIIa, IIIb, IVa, and IVb of both panels take account of the adoption/substantial reform of a VAT system, and its interaction with the BLREF. As for the openness variable (OPEN),

[6] This approach has been adopted previously to analyse the effects of access to domestic and international markets on poverty in China (Emran and Hou, 2013), to estimate occupational choice on health behaviour (Kelly et al. 2014). A special case of this method has been used by Rigobon and Rodrik (2005) to specifically instrument institutions.

the VAT variable seems only to impact TRGDP. REVGDP including property revenues are only influenced by VAT via the presence of NRR. When taking jointly care of BLREF and VAT reform, these variables are mutually reinforcing, both for TRGDP and REVGDP. This result validates the intuition of complementary between tax and business law reforms (Dourado, 2013).

Table 3 presents results relying on Lewbel (2012)'s instrumental approach. Qualitatively, they are quite close to estimation results in Table 1. The coefficient on our variables of interest BLREF and VAT are slightly lower when using our instrumental variable approach, pointing towards an upward bias in Table 1 results (due to a positive correlation between BLREF and the dependent variables). Also the OPEN and the CONF variables have consistent signs across specifications, and in particular for both dependent variables, in line with results in most of the literature in the area. Interaction terms with our variables of interests are consistent and even sometimes reinforced compared to FE results. In particular, the interaction between VAT and NRR is now positive and significant, in column IVb of the second panel, in line with column IIIb results.

Further results are very similar in both tables, and therefore do not warrant further comments.

5. Conclusion

In this paper, we use a new indicator of a significant modernization of corporate law, meant at improving the legal environment for business. This complements the standard institutional indicators, based on perception. Furthermore, in order to overcome the potential endogeneity issue, we rely on an internal instrumental variable approach.

Our empirical results validate the influence of business (and tax law) reforms on countries' tax mobilization ability. Furthermore, the complementarity between business and tax law reform, amply discussed in the law and economics literature, is supported by our econometric results.

Table 1: Fixed effects estimations

VARIABLES	(Ia)	(IIa)	(IIIa)	(IVa)	(Ib)	(IIb)	(IIIb)	(IVb)
	TRGDP				REVGDP			
BLREF	**0.873****	**2.024*****		**0.311**	**1.392****	**0.655**		**-0.340**
	[0.403]	[0.446]		[0.699]	[0.542]	[0.614]		[1.001]
VAT			**1.264*****	**0.862**			**-0.812**	**-1.249***
			[0.454]	[0.539]			[0.623]	[0.739]
LNGDPCAP	3.375***	3.308***	3.405***	3.191***	3.312***	3.373***	3.456***	3.159***
	[0.694]	[0.680]	[0.684]	[0.686]	[0.933]	[0.930]	[0.941]	[0.945]
OPEN	2.631***	2.383***	2.726***	2.666***	1.162	1.289	1.093	1.054
	[0.826]	[0.811]	[0.807]	[0.808]	[1.133]	[1.129]	[1.132]	[1.135]
AGRICVA	-0.062***	-0.065***	-0.053***	-0.063***	-0.087***	-0.086***	-0.079***	-0.091***
	[0.021]	[0.021]	[0.021]	[0.021]	[0.029]	[0.029]	[0.029]	[0.029]
NRR	-0.053**	0.037	0.055**	0.054*	0.173***	0.118***	0.112***	0.110***
	[0.022]	[0.027]	[0.027]	[0.027]	[0.030]	[0.037]	[0.037]	[0.037]
CONF	-0.303	-0.566	-0.482	-0.674	-1.806***	-1.637***	-1.464**	-1.705***
	[0.438]	[0.431]	[0.428]	[0.429]	[0.587]	[0.589]	[0.587]	[0.590]
ODA	-0.204	-0.147	-0.022	-0.054	-0.089	-0.118	-0.141	-0.159
	[0.197]	[0.194]	[0.194]	[0.193]	[0.266]	[0.265]	[0.267]	[0.267]
BLREF*NRR		**-0.105*****		**-0.004**		**0.066****		**0.011**
		[0.019]		[0.033]		[0.026]		[0.045]
VAT*NRR			**-0.123*****	**-0.126*****			**0.084*****	**0.067**
			[0.019]	[0.033]			[0.026]	[0.046]
BLREF*VAT				**1.167***				**1.915****
				[0.660]				[0.935]
Constant	10.160***	9.359***	10.328***	11.010***	13.236***	13.734***	17.183***	18.067***
	[1.380]	[1.360]	[1.287]	[1.296]	[1.874]	[1.878]	[1.794]	[1.810]
Observations	772	772	772	772	770	770	770	770
Number of countries	41	41	41	41	41	41	41	41

Country fixed country and time dummies
Standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

6. Appendix

Table 2: Definition of variables and data sources

Variable	Definition	Source
TRGDP	Tax revenue/GDP, % of GDP.	GFS (IMF), complemented by Art. 4 reports from IMF
REVGDP	Total government revenue/GDP, % of GDP, excluding grants	GFS (IMF), complemented by Art. 4 reports from IMF
BLREF	Business law reform, (dummy variable 0/1)	Author's definition
VAT	Adoption of a VAT system, or fundamental reform of the VAT system, (dummy variable, 0/1)	IMF, Fossat P., Bua M., 2013 ; Kloeden D., 2011.
LNGDPCAP	GDP per capita (in Log form)	WB (WDI)
OPEN	Trade openness (Exports+Imports/GDP)	WB (WDI), Author's calculation
AGRICVA	Agriculture, value added (% of GDP)	WB (WDI)
NRR	Natural resource rents (% of GDP)	WB (WDI)
CONF	External and internal conflicts	Uppsala Conflict Data Program
ODA	Net Official Development Aid, billion US$	OECD

Table 3: Lewbel method

VARIABLES	(Ia)	(IIa)	(IIIa)	(IVa)	(Ib)	(IIb)	(IIIb)	(IVb)
	TRGDP				REVGDP			
BLREF	**0.446***	**1.643*****		**0.257**	**0.829*****	**0.058**		**-0.402**
	[0.247]	[0.200]		[0.163]	[0.309]	[0.281]		[0.307]
VAT			**1.486*****	**0.861*****			**-0.735****	**-1.257*****
			[0.250]	[0.140]			[0.329]	[0.252]
LNGDPCAP	2.916***	2.943***	2.954***	3.128***	2.471**	3.212***	3.622***	3.191***
	[0.683]	[0.496]	[0.481]	[0.256]	[0.962]	[0.683]	[0.660]	[0.409]
OPEN	4.267***	2.873***	3.157***	2.856***	2.769**	2.373***	2.616***	1.692***
	[0.878]	[0.541]	[0.534]	[0.255]	[1.138]	[0.819]	[0.768]	[0.498]
AGRICVA	-0.037**	-0.056***	-0.057***	-0.062***	-0.076***	-0.057***	-0.053**	-0.075***
	[0.016]	[0.011]	[0.012]	[0.006]	[0.027]	[0.020]	[0.021]	[0.013]
NRR	-0.074***	0.021	0.056***	0.055***	0.169***	0.087***	0.085***	0.110***
	[0.023]	[0.017]	[0.017]	[0.008]	[0.038]	[0.031]	[0.032]	[0.021]
CONF	-0.087	-0.480**	-0.379*	-0.671***	-1.213**	-1.136***	-1.108***	-1.480***
	[0.306]	[0.213]	[0.212]	[0.099]	[0.490]	[0.342]	[0.352]	[0.219]
ODA	-0.090	-0.144*	-0.009	-0.063*	-0.012	-0.028	-0.070	-0.105
	[0.137]	[0.076]	[0.071]	[0.032]	[0.193]	[0.149]	[0.141]	[0.088]
BLREF*NRR		**-0.096*****		**-0.007**		**0.081*****		**0.008**
		[0.009]		[0.005]		[0.017]		[0.015]
VAT*NRR			**-0.130*****	**-0.129*****			**0.086*****	**0.072*****
			[0.012]	[0.008]			[0.017]	[0.015]
BLREF*VAT				**1.210*****				**1.769*****
				[0.147]				[0.279]
Constant	13.601***	13.382***	12.987***	13.342***	15.381***	15.508***	15.905***	16.438***
	[3.857]	[3.950]	[3.858]	[3.812]	[4.875]	[4.775]	[4.906]	[4.839]
Hansen J statistic	111.914	72.693	115.389	165.208	79.5	108.75	111.311	229.836
(p-value)	*0.9177*	*0.2961*	*0.8755*	*1*	*0.141*	*0.9463*	*0.9239*	*1*
Observations	772	772	772	772	770	770	770	770
Number of countries	41	41	41	41	41	41	41	41

Country fixed country and time dummies
Breusch Pagan test reject null of no heteroskedasticity
Robust standard errors in brackets
*** p<0.01, ** p<0.05, * p<0.1

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