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Assessing the relationship between democracy and domestic taxes in developing countries

Helene Ehrhart
CERDI - University of Auvergne and Banque de France

Abstract

To what extent differences across developing countries in their domestic tax mobilisation can be explained by their political regime? Using a panel of 66 developing countries over 1990-2005, we found that democracy matters for achieving higher domestic taxes mobilisation. The constraints on the executive are especially of importance to counter the government's propensity to cave in for special interests and be insufficiently welfare minded. Moreover, democracy is specifically needed in natural resource rich countries to make natural resource rents contribute to higher domestic taxes and no longer be an impediment to a sustained tax system.

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Contact: Helene Ehrhart - helene.ehrhart@gmail.com.
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1. Introduction

Coordinated tax-tariff reforms in developing countries favour a decrease in tariffs to enhance efficiency with an increase in domestic taxation in order to maintain enough revenue to finance public goods. However, Baunsgaard and Keen (2010) found that, for many low-income countries, this revenue substitution is difficult since they recovered, at best, no more than about 30 cents of each lost dollar. These countries are really in need of increased domestic tax revenues (direct taxes - taxes on income and profit - and domestic indirect taxes – value added/sales taxes and excises) since the 66 countries in our sample collected only, on average over the period 1990-2005, about 10 percent of GDP from domestic taxation compared with the figure of 27 percent of GDP for OECD countries.[1] Burgess and Stern (1993) highlighted that the constraints on raising revenue through personal income taxation in developing countries are many and include problems of income measurement, administrative capability and poor accounting. These differences in tax revenue collection can also partly be explained by the existence of a larger shadow economy in developing and transition economies compared to OECD countries (Enste and Schneider, 2000).

The only slow progresses in domestic tax mobilisation might however not only be due to the structural impediments prevalent in developing countries but also to political economy factors which should be taken into consideration. As far as trade taxes are concerned, it is well established in theoretical and empirical works that trade policy decisions are used by governments of both developed and developing countries to favour special interest groups, making a trade off between welfare and rents (see Grossman and Helpman, 1994; Goldberg and Maggi, 1999 among others). The importance of political economy factors in the developing countries' domestic tax decisions has however been less studied. Nonetheless, experiences in these countries let us think that they may play a huge role. Indeed, governments could be tempted either to protect specific sectors by enacting non neutral Value Added Taxes (VAT) and excises and by according exemptions to some interest groups or to set the VAT threshold at a particular level,[2] leading to significantly less tax revenues.

Given this background, the contribution of this paper is to show that, if political economy factors matter in domestic tax policies, they can be accommodated by increased democracy. We thus examine whether the type of political regime in place, with all its inherent features, is relevant for explaining the performances of domestic tax revenues in developing countries. In the presence of a weak system of checks and balances and if powerful economic elites control the political process, the government might be less welfare minded and it will easily grant favours to special interests resulting in lower tax revenue collected.

Institutional factors as determinants of tax revenue in developing countries have been taken into consideration in some studies. Bird et al. (2008) postulate that if taxpayers both perceive that their interests are properly represented in political institutions and that the governance is good, their willingness to contribute by paying taxes increases. Using cross section data, they find that corruption and voice and accountability play a significant role in the determination of developing countries tax effort. Cheibub (1998) studied in 108 countries over the period 1970-1990 whether the infant democracies are as able as autocracies to collect taxes. The use of a discrete measure of political regime is quite limiting but he found that there are no grounds for believing that democracies are any less able than dictatorships to extract resources from society through taxation.

Our study is in the continuity of this research field but sheds a light on the detrimental effect of interest groups on domestic tax revenues, effect that could be accommodated by more democratic institutions. The contribution is threefold. Firstly, we use several measures

[1] It is assumed throughout the paper, as do Keen and Mansour (2010), that increasing tax revenues is an accepted policy objective for low income and lower middle income countries.

[2] In Uganda, for instance, the near-failure of the VAT introduced in 1995 was quelled in large part by rapidly increasing the threshold from $20 000 to $50 000 (Keen and Mintz, 2004).

for political regime, both continuous and discrete to ensure the robustness of the result. Secondly, we treat the political regime as being endogenous to the performance of tax revenue and propose an original instrument, inspired by the democracy determinants literature, namely the democracy level of the country's neighbours. Thirdly, we use disaggregated measures of democracy in order to understand which aspect is of importance for enhanced tax mobilization and we investigate in which kind of countries democracy could especially be beneficial for tax collection.

To preview our results, we find that higher levels of democracy are leading to increased domestic tax revenue performance. Our evidence reveals that the level of constraints on the executive seems to be the driving force behind the result. These democratic institutions are particularly important in natural resource abundant countries where higher levels of democracy can transform the negative influence of the initial presence of natural resource rents on domestic tax revenue into a positive one. The paper is divided into five sections. Section 2 presents the relationship between the political regime and taxation. Section 3 describes our empirical framework and section 4 presents the results of the panel analysis. Finally, section 5 concludes.

2. Political regimes and taxation

How might a country's political regime influence its domestic tax performance? The economic theory highlights some features of political regimes that might be of importance for enhanced domestic tax mobilisation.

First of all, representation is critical since the economic reforms implemented depend on who controls the political office. Indeed, Acemoglu and Robinson (2006) model autocracy as a dictatorship of the rich and democracy as a dictatorship of the poor or middle classes. As the rich are acting against redistribution and therefore against taxation, less reforms to increase taxes should be implemented in an autocracy. Alesina and Rodrik (1994) confirm this idea by predicting that, in societies where the choice of policy is determined by the median voter theorem, as in democracies, and where a large proportion of population does not have access to capital, there will be a strong demand for taxation. This corresponds particularly to developing countries where the median voter's share of capital income (relative to his labour income) is low, thus his ideal tax is high. Mitra et al. (2002), using Turkish industry level data, found that the government's weight on welfare, compared to the weight on lobbies' contributions, is generally higher for democratic regimes than for dictatorships. Drawing on these predictions, it can be hypothesised that democracies might take more into account the social welfare and be characterised by larger tax reforms, taking the form of higher taxation, to mobilise more revenue for redistributive policies.

Secondly, the accountability structures might also be different according to the political regime. In democracies, the level of constraints on both executive and legislative powers should be greater since they demand accountability to a broad set of citizens at regular intervals whereas dictatorships are mainly accountable to a smaller group such as the military. Adam et al. (2011) found both theoretically and empirically that democratic institutions are able to restrain public sector inefficiencies because of electoral control. Thus, more accountability structures in democracies give less latitude for decision makers to respond to special interests. For instance, in Morocco, the value added tax, implemented in 1986, still generates insufficient revenues because of its complexity and the numerous exemptions that were granted in response to various interest groups (Brun et al., 2007). Acemoglu and Robinson (2008) show that the impact of institutions on economic outcomes depends on the interaction between de jure political power, whose allocation is determined by political institutions, and de facto political power, which is determined by the equilibrium investments and organisations of different groups. In democracy, the balance of de jure power is tilted toward the citizens, while in nondemocracy the elite have greater de jure power. If the elite is able to garner sufficient de facto political power in democracy, the

equilibrium probability of pro-elite institutions may be higher in democracy than in nondemocracy. However, if democracy creates a substantial advantage in favour of the citizens, it may destroy the incentives of the elite to engage in activities that increase its de facto power. This idea is confirmed by Calderon and Chong (2006) who found that higher political constraints in the policy decision process are negatively and significantly associated with rent-seeking behaviour. Therefore, democracies with specific constraints structures, effective checks and balances, can decrease the possibilities for leaders to respond to interest groups seeking for less domestic taxation.

Given these theoretical predictions, democracies in developing countries should be more able than autocracies to implement tax reforms, taking the form of higher domestic tax revenues. Indeed, they should implement more redistributive policies and less respond to special interests, by enacting fewer specific tax exemptions detrimental to public revenues.

3. The empirical framework

To estimate the influence of the political regime on domestic tax revenue, we use a panel data analysis for 66 developing countries (see Table 1). We retained the countries belonging to the low income and the lower middle income groups in the World Bank classification.[3] With this classification, China and India are inside the sample but the two other BRIC countries, namely Russia and Brazil are excluded. We will therefore present our main results without any BRIC country in the sample and then with the 4 BRIC countries included to assess the robustness of our estimations. Our period of analysis is 1990-2005.[4] All variables are three year averages, the sub periods being 1990-1992, 1993-1995, 1996-1998, 1999-2001 and 2002-2005. The basic estimated equation is of the following form:

$$Domestictaxrev_{it} = \alpha + \beta Democracy_{it} + \delta X_{it} + \mu_i + \lambda_t + u_{it} \qquad (1)$$

where *i* and *t* are country and time period indicators respectively, *Domestictaxrev* is the domestic tax revenue as part of GDP composed of direct taxes (taxes on income and profit) and domestic indirect taxes (value added/sales taxes and excises), *Democracy* is the measure of democracy and the vector *X* captures other explanatory variables, discussed further below, affecting the domestic tax ratio. The term μ_i is a country specific effect, λ_t is an unobserved time effect included to rule out results driven by common time varying factors not otherwise included in our model and u_{it} is an unobserved random error term.

3.1 Data sources and statistics

Domestic tax revenues, domestic indirect taxes plus income taxes, are based on the Government Finance Statistics (GFS) and completed by the Article IV data.

We resort to a variety of variables to capture the level of democracy. Firstly, as in De Haan and Sturm (2003) or Tavares and Wacziarg (2001) among others, we employ Freedom House's ranking of countries with respect to their political rights. This political rights measure expresses the degree to which individuals have control over those who govern. Secondly, we follow Besley and Kudamatsu (2006) and Mulligan et al. (2003) and use the Polity2 variable, from the Polity IV project, which captures the regime authority spectrum from hereditary monarchies to consolidated democracies. All these variables were normalised so that they range between zero (autocracy) and unity (full democracy). Thirdly, in order to show that our results are not sensitive to the choice of the democracy measure, we

[3] 96 countries belong to these groups but, due to missing values for some low income countries, our final sample comprises 66 countries.

[4] We begin the sample in 1990 to ensure that the data on domestic taxes are reliable. Indeed, before this date, what was recorded as international trade taxes often also included value added taxes and excises collected at the border leading to an underestimation of the domestic tax revenue. This flaw has progressively been corrected and, since 1990, the distinction has been generally correctly made.

use as alternative indicator, the dichotomous regime classification from the dataset Democracy Dictatorship introduced by Alvarez et al. (1996) and Przewroski et al. (2000) [5] and recently extended by Cheibub et al. (2009). The democracy dummy takes the value of one if the country is a democracy and zero otherwise.

Drawing on the empirical literature that models the share of tax revenues in GDP (Adam et al., 2001; Khattry and Rao, 2002; Keen and Lockwood, 2009), we include the following variables as control. The GDP per capita is a proxy for overall development, higher level of per capita income is usually found to be positively related to domestic tax revenues. The structure of the economy is both measured by the share of agriculture in GDP usually negatively associated with domestic tax revenues and by the degree of urbanisation which is expected to have a positive impact on domestic tax revenues. The level of imports should be positively associated with domestic tax performance given that, in developing countries, a large part of the VAT collected is levied on imports. Higher inflation is supposed to reduce domestic tax yields according to the Tanzi Olivera effect. Evidence shows that foreign aid and especially grants have been associated with increases in tax revenue over the period 1985-2005 (Clist and Morrissey, 2011). We also include the proportion of the population over 65 years and the share under 14 years old, the tax ratio usually being increasing with the number of dependent in the population. All these variables are from the World Development Indicator (WDI) database. Finally, we introduce the measures of bureaucracy quality and of corruption compiled by the Political Risk Services Group (ICRG) and rescaled from 0 to 1 as additional control variables. Descriptive statistics are presented in Table 2.

3.2 The econometric issues

Given the persistence of domestic tax revenues, there is a suspicion of serial correlation which is confirmed by a Wooldridge test. To correct for it, we use an estimator which fits panel regression models when the disturbance term is first-order autoregressive. A concern may also arise about the endogeneity of democracy with tax performance. One can argue that the relationship between democracy and tax revenue is unlikely to be unidirectional for two reasons. Firstly, a higher level of taxes might be needed to invest and build expensive democratic institutions. Secondly, the Tilly (1975) hypothesis postulating that citizens are provoked into scrutiny by taxation was tested empirically by Ross (2004) who finds that the larger the share of government expenditure financed through taxation, the more likely the government is to become representative. There is therefore a potential reverse causality from taxes to democracy. To correct this endogeneity, we resort to an instrumental variable estimation with an original instrument for democracy, namely the democracy level of the country's neighbours. The choice of adequate instruments for democracy is not widely addressed in the literature. However, following Persson and Tabellini (2009), it is easily imagined how the experience with democracy in foreign, and especially in neighbouring countries could spill over into greater domestic appreciation of democracy and greater willingness to defend these values. Persson and Tabellini (2009) use a weighting matrix of the distance between all countries in the world whereas we deviate slightly by considering only the neighbouring countries with a weighting matrix taking the value of one if two countries are neighbours and zero otherwise. We postulate that citizens in a country are even more aware of what is happening and how democratic is their direct neighbourhood since they meet more easily citizens from a country with which they share a border than citizens from countries further away. Thus, we create the variable neighbouring democratic capital to measure a country's "closeness to democracy", given the incidence of democracy in neighbouring countries. Specifically, for the country i with n_i neighbours j in year t, we define

[5] This dichotomous measure was used, for instance, by Lee (2003) to asses the level of democracy.

$$Ndemocracy_{it} = \frac{1}{n_i} * \sum_{j=1}^{n_i} democracy_{jt} .$$

Given this formula, the variable neighbouring democratic capital of Cameroon, for instance, will be the mean of the levels of democracy prevalent in its neighbouring countries, namely Nigeria, Chad, Central African Republic, Republic of Congo, Gabon and Equatorial Guinea. This variable is constructed for each of our democracy measures, namely NPoliticalRights, NPolity2, NDummyDemo, NPoliticalcompetition and NExecutiveconstrainsts. The first stage regressions will be presented in order to check whether our instrument is significantly related to democracy.

4. Results

In this section, we will firstly examine whether the political regime has an impact on domestic tax mobilisation. Secondly, we test which aspect of the political regime is crucial to reach higher domestic tax revenues. Lastly, we investigate in which countries the positive effect of a certain kind of political regime might be especially necessary.

4.1 The influence of the political regime on domestic tax revenues

Estimations of the influence of the political regime on the domestic tax ratio are reported in Table 3 for our first measure of democracy, Polity2. The fourth column shows the results of the instrumental variable regression with random effects (the Hausman test did not reject the null hypothesis that the random effects model is consistent and efficient) corrected for first-order autocorrelation of a basic tax effort equation. These results, corrected for endogeneity, suggest a positive and significant effect of democracy on domestic tax revenues as part of GDP. The results of the associated first stage equation in column 1 indicate support for the validity of our instrument, the level of democracy in the neighbourhood being a highly significant determinant of democracy.[6] After introducing additional control variables (column 5) and adding the four BRIC countries in the sample (column 6), the coefficient of democracy remains strongly positive and significant at one percent. With the last specification, an increase of one standard error in the democracy index permits a rise of 9.163*0.29=2.66 percentage points in the domestic tax revenue as part of GDP. For the mean level of domestic tax revenue in our sample, 9.86 percent of GDP, this corresponds to a non negligible rise of about 25 percent. A number of regularities among the control variables emerge. As expected, the level of imports is positively and significantly related to domestic tax revenues and a higher bureaucracy quality leads to significantly higher domestic taxes. The proportions of dependent in the population are significantly associated to the domestic tax revenues. Lastly, the coefficients of the level of per capita GDP and of the agricultural sector share are negative though not significant.

In order to corroborate our results and check whether they are robust, whatever the democracy indicator used, we present the results with two additional alternative measures for democracy using the instrumental variable estimator. In Table 4, we present the results with the Political Rights indicator (columns 5 and 6) and with the Democracy Dummy (columns 7 and 8). The coefficient of democracy, measured with the Political Right indicator, remains significantly positive, without and with the BRIC countries. The corresponding instrument, NeighbourPoliticalRights, is statistically significant, at one percent, in the first stage equation (column 1). In column 7, the democracy index is a discrete measure extracted from the Democracy Dictatorship dataset. The 2SLS estimates, corroborate the result that more democratic regimes achieve higher domestic tax revenues hypothetically because they are able to accommodate political economy factors and grant less tax exemptions.

[6] With only one instrument, it is the Student t statistics and the corresponding p-value which should be considered to assess the strength of the instrument.

Another concern is whether this positive effect of democracy on domestic taxes is not only due to a better quality of public spending in democracies which could enhance the citizen's tax morale, leading to an increased tax mobilisation. Rajkumar and Swaroop (2008) show that higher public spending quality can be achieved only when good governance is present, because low levels of corruption and good bureaucracy quality are necessary to ensure the development effectiveness of public spending.[7] Therefore, the two control variables, bureaucracy quality and level of corruption, in our estimations, permit to ensure that our result of democracies achieving higher domestic tax mobilisation is not only due to an enhanced quality of public expenditure under democratic regimes but might also come from the fact that, as developed in the theoretical part, democracies are more social welfare oriented and respond less to private interests and are therefore able to achieve higher tax revenues. We will now investigate this issue by distinguishing the different components of the democracy measure.

4.2 What matters in democracy for increased domestic tax revenues?

It is interesting to understand which aspect of democracy is the driving force behind the result of increased domestic tax collection in more democratic regimes. We explore this issue by using two component measures of the Polity2 index that might be of importance, namely Political Competition and Constraints on Executive. The variable Political Competition represents the extent of competitiveness in political participation whereas the Executive Constraints variable assesses the extent of institutional constraints on the decision making powers of the chief executive. If our hypothesis of autocracies being less welfare minded, since they tend to respond more to special interest groups who seek less domestic taxation is valid, it might be particularly high levels of executive constraints that could limit the possibility for the governments to cave in for special interests. In Table 5, we test the impact of both components of democracy to assess whether one aspect of democracy is predominantly important to achieve higher domestic tax mobilisation. The level of constraints on the executive (column 2) impacts significantly the domestic tax performance whereas column 4 reveals that the level of political competition has a statistically non significant impact on domestic tax revenues. One may conclude that the level of executive constraints in a country is really of significantly great importance for enhanced domestic tax mobilisation. The reason is probably that they oblige policy makers to take more into account the social welfare in their decision making process, through redistributive taxation and less favours accorded to various interest groups.

4.3 Where can the positive effects of democracy be especially needed?

Since we identified a positive effect of democracy on domestic taxes, one may wonder in which countries this positive effect of democracy will especially be needed? The abundance of natural resource rents as part of GDP is expected to be an impediment to tax mobilisation (Bornhorst et al., 2009). Indeed, the availability of high natural resource rents in the beginning of our period of analysis (id est the first three years of the 1990s) might have created a soft budget constraint and not induced governments to implement substantial domestic tax reforms therefore leading to lower tax revenues on the entire time period. In their model, Collier and Hoeffler (2009) show that the abundance of natural resources might be detrimental to tax mobilisation probably both because higher rents are creating lower incentives for governments to mobilise tax revenue and because governments of oil rich countries consciously set low tax rates so as not to provoke scrutiny of the natural resource revenues. The measure of natural resource rents is calculated using environmental economic data from the World Bank which includes costs of production and world prices. Higher levels of democracy might induce resource rich governments to undergo through substantial tax

[7] Frey and Torgler (2007) found that tax morale is increasing with these two aspects of institutions quality.

reforms to create a sustainable tax system. Hence, as expressed by Robinson et al. (2006), countries with institutions that promote accountability might be able to benefit from resource booms since democratic institutions are able to limit the detrimental political economy aspects generated by resource booms. In presence of an efficient tax system, the existence of natural resource rents can contribute to increased tax revenues both through direct profit taxation and through increased VAT revenues. We test this assumption in Table 6 by introducing an interactive variable between the democracy measure and the level of natural resource rents in the beginning of the 1990s[8] (INatRes).

Results with the 2SLS estimator are presented for two measures of democracy, the Polity2 index and the component that was found of importance to increase tax mobilisation, the level of constraints on the executive. We instrument both the democracy and the weighted variable INatRes*Democracy (see in columns 1, 2 and 4, 5 the first stage equations). Across all specifications, the natural resource rents variable is negative and significant whereas the weighted variable (Initial Natural Resource Rents * Democracy) is significantly positive. Consequently, for a given level of natural resources, sufficiently high levels of democracy and of constraints on the executive can transform the negative impact of the presence of these initial natural resource rents on tax mobilisation into a beneficial one.

To explore more deeply the idea of a turning point in the natural resource influence, the threshold of democracy above which the negative impact of natural resource rents on tax revenue disappears is calculated in Table 7. For levels of democracy, either Polity2 or Executive Constraints, below the threshold, the initial natural resource endowment has a negative effect on domestic taxes mobilization but for sufficiently high levels of democracy, this negative effect becomes a positive one. The thresholds are higher than the mean level of democracy in our sample. Among the natural resource abundant economies, only few are characterised by levels of democracy above the estimated threshold but it corresponds, for example, to democratic institutions like the ones in Bolivia, Mongolia or Papua New Guinea. In Mongolia, for instance, significant steps have been taken to improve procedures and fiscal discipline within governments and noteworthy achievements were made in improving transparency (IMF, 2001). So conditional to sufficiently high levels of democracy, the net influence of natural resources can be positive because governments will not anymore rely solely on these rents but build a sustainable tax system where the natural resources sector could be a major contributor to tax revenues.

5. Concluding remarks

Little analytical or empirical works have studied the importance of political economy factors, in addition to traditional factors, as determinants of domestic tax revenue performance. Using a panel of 66 developing countries over the period 1990-2005 and properly correcting for the endogeneity of democracy with an original instrument, we found strong evidence that more democracy in a country does influence the extent to which domestic tax reforms are implemented and higher domestic tax revenues achieved. The estimated effect of increased democracy on tax revenue is quite large and it is the level of constraints on the executive that seems to be the driving force behind the result. Increased checks and balances are needed to counter the propensity of governments to cave in for special interests and to be less social welfare minded. We find that high levels of democracy are specifically needed in natural resource rich countries to make natural resource rents contribute to higher domestic taxes revenues and no longer be an impediment to a sustained tax system. This result can be viewed as complementary to the proposal of Devarajan et al. (2011) of redistributing to citizens a share of the oil rent and taxing it back in order to generate a virtuous circle in resource rich economies. Finally, the results of this paper bear important policy implications by showing which dimension of democracy, namely

[8] We use this indicator to make sure that the level of natural resources rent is exogenous to tax mobilisation.

constraints on executive, could help developing countries, whether endowed or not with natural resources, to achieve higher domestic tax mobilisation.

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Table 1 - Illustrative list of countries used in the regressions

Angola, Armenia, Benin, Bangladesh, Benin, Bhutan, Bolivia, Burkina Faso, Burundi, Cambodia, Cameroon, Central African Republic, Chad, Colombia, Congo Rep., Côte d'Ivoire, Djibouti, Ecuador, Egypt, El Salvador, Eritrea, Ethiopia, Gambia, Georgia, Ghana, Guatemala, Guinea, Guinea Bissau, Honduras, Indonesia, Kenya, Laos, Lesotho, Liberia, Malawi, Mali, Moldova, Mongolia, Morocco, Mozambique, Nepal, Nicaragua, Niger, Nigeria, Pakistan, Papua New Guinea, Paraguay, Republic of Syria, Rwanda, Senegal, Sierra Leone, Sudan, Swaziland, Tajikistan, Tanzania, Thailand, Togo, Tunisia, Uganda, Ukraine, Vietnam, Yemen, Zambia, Zimbabwe. BRIC countries: Brazil, China, India, Russia

Table 2 - Summary statistics

	Obs.	Mean	Std. Dev.	Min.	Max.
DomTaxRev	277	9.86	4.64	1.73	24.67
Political Rights	277	0.41	0.27	0	1
Polity 2	277	0.54	0.29	0	1
Democracy Dummy	277	0.37	0.47	0	1
Political Competition	275	0.45	0.27	0	0.90
Executive Constraints	273	0.49	0.31	0	1
GDP capita (log)	277	6.15	0.87	4.67	8.35
Population sup 65	277	3.93	1.91	2.16	15.48
Population inf 14	277	41.25	6.46	15.44	51.24
Aid capita (log)	277	3.92	0.53	2.12	5.39
Imports (%GDP)	277	40.66	20.04	8.98	124.29
Agriculture (%GDP)	277	28.04	14.05	3.45	73.83
Urbanisation	277	36.85	18.99	5.98	85.26
Inflation (log)	252	2.74	0.84	0.09	7.89
Corruption	209	0.577	0.14	0.17	1
Bureaucracy Quality	209	0.39	0.20	0	0.87
Initial Natural Resources	259	5.73	7.64	0	38.34

Table 3: Influence of democracy on domestic tax revenues (%GDP)

	Polity2 *First Stage*			Domestic tax rev. (%GDP) IV AR(1) correction		
VARIABLES			*With BRIC*			*With BRIC*
	(1)	(2)	(3)	(4)	(5)	(6)
Polity 2				**6.11****	**9.304*****	**9.163*****
				(2.60)	(3.427)	(3.002)
GDP capita (log)	0.012	0.05	0.058	0.38	0.242	0.583
	(0.03)	(0.05)	(0.04)	(0.68)	(0.96)	(0.85)
Imports (%GDP)	-0.002**	0.0003	0.0002	0.04**	0.056**	0.053**
	(0.001)	(0.001)	(0.001)	(0.02)	(0.02)	(0.02)
Agriculture (%GDP)	-0.001	0.001	0.002	-0.06*	-0.044	-0.045
	(0.002)	(0.002)	(0.002)	(0.03)	(0.04)	(0.04)
Inflation (log)		-0.006	0.004		-0.133	-0.120
		(0.02)	(0.02)		(0.23)	(0.19)
Urbanisation		-0.003*	-0.002		-0.051	-0.058
		(0.002)	(0.002)		(0.04)	(0.04)
Population sup 65		-0.035*	-0.022		1.065***	1.006***
		(0.02)	(0.02)		(0.37)	(0.32)
Population inf 14		-0.023***	-0.015**		0.279**	0.217**
		(0.006)	(0.006)		(0.13)	(0.11)
Aid capita (log)		0.066*	0.053		0.299	0.292
		(0.04)	(0.04)		(0.63)	(0.57)
Corruption		-0.263*	-0.237*		2.920	2.729
		(0.14)	(0.14)		(1.87)	(1.69)
Bureaucracy Quality		-0.188**	-0.064		4.444***	3.403***
		(0.09)	(0.10)		(1.42)	(1.25)
Npolity2	0.52***	0.444***	0.478***			
	(0.07)	(0.09)	(0.09)			
Observations				277	192	207
Nb of countries				66	47	51
Hausman Test (p-val)				0.93	0.98	0.19
R-squared	0.298	0.331	0.278	0.21	0.293	0.286

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1.
Constant and time fixed effect included.

Table 4: Robustness – Influence of democracy on domestic tax revenues (%GDP)

	First Stage				Domestic Tax Revenue			
VARIABLES	Political Rights		Democracy Dummy		IV AR(1)			
		With BRIC		*With BRIC*		*With BRIC*		*With BRIC*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Political Rights					**10.77****	**10.27****		
					(4.98)	(4.25)		
Democracy Dummy							**3.149***	**2.712***
							(1.901)	(1.523)
GDP capita (log)	0.027	0.034	0.099	-0.006	0.281	0.617	0.249	0.935
	(0.04)	(0.04)	(0.08)	(0.07)	(0.89)	(0.81)	(0.93)	(0.80)
Imports (%GDP)	-0.0002	-0.0003	0.005**	0.005**	0.067***	0.062***	0.054**	0.050**
	(0.001)	(0.001)	(0.002)	(0.002)	(0.02)	(0.02)	(0.02)	(0.02)
Agricult. (%GDP)	-0.001	0.00003	0.007*	0.005	-0.02	-0.03	-0.062	-0.047
	(0.002)	(0.002)	(0.004)	(0.004)	(0.04)	(0.04)	(0.04)	(0.04)
Inflation (log)	-0.009	0.007	0.018	0.005	-0.098	-0.160	-0.172	-0.043
	(0.02)	(0.02)	(0.04)	(0.03)	(0.22)	(0.197)	(0.23)	(0.19)
Urbanisation	-0.003**	-0.002	-0.005	-0.002	-0.024	-0.037	-0.041	-0.048
	(0.0016)	(0.002)	(0.003)	(0.003)	(0.04)	(0.035)	(0.04)	(0.04)
Pop sup 65	-0.017	-0.014	0.01	-0.041	1.041***	1.044***	0.824**	0.997***
	(0.02)	(0.02)	(0.03)	(0.03)	(0.32)	(0.29)	(0.34)	(0.30)
Pop inf 14	-0.018***	-0.012**	-0.019*	-0.026**	0.332***	0.268***	0.218**	0.220**
	(0.006)	(0.005)	(0.01)	(0.01)	(0.12)	(0.10)	(0.10)	(0.10)
Aid capita (log)	0.137***	0.127***	0.023	-0.008	-0.537	-0.519	0.904	0.817
	(0.04)	(0.04)	(0.07)	(0.07)	(0.9)	(0.77)	(0.57)	(0.54)
Corruption	-0.164	-0.154	-0.239	-0.265	2.897	2.752*	1.694	1.654
	(0.14)	(0.14)	(0.25)	(0.25)	(1.80)	(1.63)	(1.64)	(1.53)
Bureaucracy Quality	-0.072	0.056	0.040	0.258	3.861***	2.642**	2.837**	2.391*
	(0.09)	(0.09)	(0.18)	(0.18)	(1.32)	(1.2)	(1.25)	(1.26)
NPoliticalRights	0.297***	0.333***						
	(0.078)	(0.08)						
NDemoDummy			0.497***	0.589***				
			(0.10)	(0.09)				
Observations					205	220	205	220
Number of countries					50	54	50	54
Hausman Test (p-val)					0.95	0.57	0.99	0.44
R-squared	0.260	0.213	0.286	0.256	0.291	0.281	0.299	0.288

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1.
Constant and time fixed effect included.

Table 5: Influence of democracy's components on domestic tax revenue (%GDP)

VARIABLES	Executive Constraints *First Stage* (1)	Domestic Tax Revenue IV-AR(1) (2)	Political Competition *First Stage* (3)	Domestic Tax Revenue IV-AR(1) (4)
Executive Constraints		**6.88****		
		(2.86)		
Political Competition				**14.11**
				(9.46)
GDP capita (log)	0.07	0.0008	0.05	-0.14
	(0.06)	(0.98)	(0.05)	(1.07)
Imports (%GDP)	-0.0007	0.09***	-0.001	0.10***
	(0.002)	(0.02)	(0.001)	(0.03)
Agriculture (%GDP)	0.005	-0.09*	-0.00007	-0.06
	(0.003)	(0.05)	(0.003)	(0.05)
Inflation (log)	0.01	0.05	0.02	-0.12
	(0.03)	(0.28)	(0.02)	(0.35)
Urbanisation	-0.003	-0.02	-0.003*	-0.009
	(0.002)	(0.04)	(0.002)	(0.04)
Population sup 65	-0.05**	1.09***	-0.03	1.26***
	(0.02)	(0.39)	(0.02)	(0.47)
Population inf 14	-0.03***	0.35**	-0.02***	0.41*
	(0.007)	(0.15)	(0.01)	(0.21)
Aid capita (log)	0.06	0.66	0.09**	-0.22
	(0.05)	(0.67)	(0.04)	(1.07)
Corruption	-0.35**	2.08	-0.23	2.23
	(0.17)	(2.27)	(0.16)	(2.79)
Bureaucracy Quality	-0.009	3.34**	-0.12	5.24***
	(0.11)	(1.55)	(0.10)	(1.90)
NExecutiveConstraints	0.49***			
	(0.1)			
NPoliticalCompetition			0.17**	
			(0.08)	
Observations		157		157
Number of countries		45		45
R-squared	0.36	0.42	0.24	0.42

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1.
Constant and time fixed effect included.

Table 6: Natural resources influence on domestic tax revenue conditional to democracy

VARIABLES	Polity2	INatRes*Polity	DTaxRev	ExConst.	INatRes* Exconst	DTaxRev
	First Stage		IV AR(1)	*First Stage*		IV AR(1)
	(1)	(2)	(3)	(4)	(5)	(6)
Polity2			3.4			
			(4.263)			
INatRes*Polity			**0.7****			
			(0.32)			
ExConstraints						0.92
						(3.64)
INatRes*ExConst						**0.63*****
						(0.21)
INatural Resource	0.01	0.28***	**-0.42****	-0.002	0.06	**-0.34*****
	(0.01)	(0.08)	(0.19)	(0.006)	(0.07)	(0.12)
GDP capita (log)	-0.001	0.76	0.12	-0.001	0.19	-0.12
	(0.05)	(0.57)	(0.96)	(0.06)	(0.71)	(0.96)
Imports (%GDP)	-0.0002	-0.01	0.08***	0.00009	-0.01	0.1***
	(0.001)	(0.02)	(0.02)	(0.002)	(0.02)	(0.02)
Agriculture (%GDP)	0.0004	0.068**	-0.09*	-0.0002	0.024	-0.12**
	(0.002)	(0.03)	(0.05)	(0.003)	(0.04)	(0.05)
Inflation (log)	0.001	0.34	-0.33	0.0006	0.28	-0.08
	(0.02)	(0.24)	(0.26)	(0.03)	(0.34)	(0.28)
Urbanisation	-0.0001	-0.03	-0.02	0.0001	-0.01	-0.004
	(0.002)	(0.02)	(0.04)	(0.002)	(0.02)	(0.04)
Population sup 65	-0.002	-0.15	1.32***	0.0001	-0.17	1.29***
	(0.02)	(0.26)	(0.38)	(0.03)	(0.31)	(0.38)
Population inf 14	-0.001	-0.04	0.39***	0.00	-0.01	0.40***
	(0.009)	(0.10)	(0.14)	(0.01)	(0.13)	(0.15)
Aid capita (log)	0.01	0.76	-0.08	-0.005	0.45	0.25
	(0.04)	(0.53)	(0.7)	(0.05)	(0.62)	(0.68)
Corruption	0.001	-0.33	3.39*	0.0009	-0.86	1.74
	(0.15)	(1.84)	(1.93)	(0.18)	(2.23)	(2.21)
Bureaucracy Quality	0.01	1.69	2.84*	-0.003	0.92	2.94*
	(0.10)	(1.21)	(1.55)	(0.12)	(1.4)	(1.56)
Polity2 hat	1.10***	4.82*				
	(0.24)	(2.83)				
INatRes*Polity hat	-0.01	0.56***				
	(0.01)	(0.13)				
Exconst hat				0.96***	1.63	
				(0.24)	(2.86)	
INatRes*ExConst hat				0.004	0.90***	
				(0.01)	(0.13)	
Observations			188			155
Nb of countries			46			44
R-squared	0.32	0.75	0.39	0.37	0.72	0.46

Robust standards errors in brackets. ***p-value<0.01, **p-value<0.05, *p-value>0.1. Constant and time fixed effect included. Following Wooldridge (2002), Polity2 hat is the predicted dependent variable of a preliminary regression:

Polity2 = NPolity2 +INatRes +Corrupt +BurQual +GDP +Imports +Aid +Infl +Urb +Pop65 +Pop14 +Agri + λ_t

and INatRes*Polity hat is the result of Polity hat * INatRes. These two variables are then used as instrument for our two endogenous variables: Polity and Polity*INatRes. A similar procedure was used for the ExConst variable.

Table 7: Turning point in the effect of natural resources rents on domestic taxes

	Polity 2	Executive Constraints
$\frac{\partial Tax\ \mathrm{Re}\ venue}{\partial INat\ \mathrm{Re}\ s}$	= -0.42 +0.7*Polity2	= -0.34+0.63*ExConst
Threshold	Polity2 = 0.61	ExConst = 0.54