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A Comparative View on the Tax Performance of Developing Countries: Regional Patterns, Non-Tax Revenue and Governance

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Abstract Some countries fail to ensure that their citizens and businesses make an appropriate contribution to the financing of public tasks. But not all countries with a low tax ratio automatically fall into this category. This paper presents an approach to bridge the gap between probabilistic statements based on statistical analyses, and country-specific information. Rather than defining general across-the-board criteria, the approach accounts for different development levels and other influencing factors, such as regional patterns, non-tax revenue and governance. Findings on individual countries or groups of countries should put governments, donors and international organisations in a better position to decide on tax reform programmes and aid modalities.

JEL H20, O23, O19

Keywords Tax system; tax ratio; governance; developing countries

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1 Introduction

Pressure is mounting for countries with low tax yields or lax enforcement of tax laws. International players as the Organisation for Economic Co-operation and Development (OECD), the World Bank and the G20 are calling for more determined action to combat tax evasion and avoidance. With the world still fighting the effects of the global financial and economic crisis, there is growing pressure on tax havens to increase the transparency of their tax systems and put an end to unfair competitive practices. Developing countries, too, are being urged to do more to mobilize domestic resources rather than rely on a constant inflow of official development assistance (ODA) funds (OECD 2010; European Commission 2010).

Some countries clearly fail to ensure that their citizens and businesses make an appropriate contribution to the financing of public tasks. In such cases there are a number of reasons for changing the development portfolio, reducing ODA or even stopping cooperation altogether. But not all countries with a low tax ratio automatically fall into this category. Governments, donors and international organizations need to be able to assess the performance of tax systems in a broader context of development, governance and international cooperation.

The most important providers of this kind of information are the World Bank's Country Policy and Institutional Assessments (CPIAs) and Doing Business Reports, the OECD reports and databases, especially on sub-Saharan Africa, the European Commission's Fiscal Blueprints, the Public Expenditure and Financial Accountability (PEFA) Reports and the Collecting Taxes database funded by USAID. Additionally, several new benchmarking and assessment tools are currently being developed (see IMF et al. 2011; OECD 2012), but with an almost exclusive focus on tax administration. Still, most developing countries are already the subject of at least some country-specific information on tax systems and revenues.

Much of the available in-depth information, however, is not truly comparative,¹ and much of the comparative information is not truly in-depth. As a result, governments and donors approach tax reform in developing countries

¹ It could be argued that PEFA and CPIA scores do lend themselves to (within-country or cross-country) comparisons. De Renzio (2009) and PEFA Secretariat (2009) discuss this issue with regard to PEFA scores.

strictly on a case-by-case basis. Tax-related criteria of donor programs or new aid modalities are defined without the potential of available comparative data being fully tapped. The tax ratio (tax revenue as a percentage of GDP) in developing countries is often assessed according to absolute threshold values, regional averages or OECD tax ratios. None of these procedures appears to be convincing, however, as they do not take into account the conditions and development levels of individual countries.

The present paper combines quantitative and qualitative approaches in the comparative analysis of tax systems. As a first step it argues that 'tax performance' should not be assessed against absolute values (such as the average OECD tax ratio) or theoretical tax yields.² Rather, it should be approached as a function of tax ratio and development level (using the logged GDP per capita as a proxy). The relation between both variables is well-founded both in theoretical and empirical terms (Musgrave 1969; Chelliah 1971; Tanzi 1992; Piancastelli 2001; Gambaro et al. 2007), which is why it is used here to determine three broad groups of tax performers ('low', 'average' and 'high'). In subsequent steps of the analysis, we introduce and discuss additional variables, such as regional patterns, non-tax revenue and governance levels, within a qualitative analytical framework specifically focusing on the group of 'low tax performers'.

Section 2 presents the analytical narrative and discusses the problem of data quality and accessibility. Section 3 follows up with the main findings of the analysis. Section 4 summarizes the results and addresses the question of how development cooperation partners should handle the findings.

² The paper refers to 'tax performance' primarily from a revenue-raising perspective, which is probably the most prominent approach in the literature. It is, however, not the only one: Other assessment criteria consider the impact of taxes on economic growth, efficiency and equity (see Di John 2009; 2011). For instance, several recent studies produced under the roof of the UN Economic Commission for Latin America and the Caribbean (ECLAC) address the issue of tax system efficiency and progressiveness in Latin America. See Gómez Sabaini et al. (2011); Gómez Sabaini and Jiménez (2011). Other studies explore the relationship of tax collection and inequality, such as for instance Bird et al. (2004) and Timmons (2010).

2 Assessing tax performance – concepts, literature and data

State capacity includes the capacity to collect taxes. States with low per capita income do not, as a rule, meet the administrative and institutional requirements for a tax system at OECD level. Public expenditure, on the other hand, increases with higher development levels, generating pressure to mobilize revenue (Wagner’s Law, see Musgrave 1969; de Ferranti et al. 2004). An appropriate appraisal of a state’s efforts to tax its citizens must therefore take its level of development into account.

Hence, the **first assumption** made in this paper is that the capacity of a government to raise tax revenue increases with that country’s development level. This assumption does not establish a *causal* relationship between tax ratio and development level. We do not think that rich countries raise more taxes simply *because* they are rich.³ Rather, we suspect that a number of underlying causal links drive this relationship, some of which are mentioned, for instance, by Cheibub (1998: 358–359):

“Per capita income indicates the availability of resources to be taxed, as well as the existence of administrative capabilities for collecting taxes: at higher levels of per capita income, economies tend to be more monetized and less informal, making it easier for the government to collect taxes”.

Against this background, there is little sense in assessing a low-income country’s tax effort by comparing it to OECD levels or to some absolute values – a reference we find astonishingly often in development policy (see for instance UNDP 2010). Linking tax revenue to development levels also leads to more realistic expectations concerning changes in tax revenue. Drastic alterations from

³ Cheibub (1998) as well as Pessino and Fenochietto (2010) present evidence on the significance of GDP per capita even controlling for factors such as trade openness, agricultural production, foreign debt or political variables. Several other studies show, however, that the variable tends to lose statistical significance or even changes signs once additional control variables are introduced. For instance, see Tanzi (1992); Burgess and Stern (1993); Piancastelli (2001); Teera and Hudson (2004) (all controlling for country income groups); Clist and Morrissey (2011) (distinguishing income groups and time periods); Mkandawire (2010) (controlling for historical world market integration based on labour or cash crops).

one year to another are typically the outcome of external shocks, or the product of data corruption and misreporting.

The paper relates the tax ratios of 177 countries to their logged GDP per capita. This relationship provides a first standard of comparison: by means of an OLS regression it establishes a trend line (fitted values) and determines the distance of each country from this line.⁴ According to their position relative to the trend line, countries are then grouped into three categories: average, high and low tax performers. Grouping countries into these broad categories gives us a first idea of how they fare in terms of tax collection at a given point in time. By choosing 2007 to 2008 as the most recent observation period, we cover the years before the outbreak of the world economic crisis, with its rather distorting impact on the public finances of many developing and developed countries. We are also able to gather data for a large group of countries.⁵

Besides gaining an impression of recent tax performance, we want to know how tax performance changes over time. For instance, it could be that a country is still below the trend line, although it has increased its tax ratio in recent years. Only long-term observation will provide information on the fiscal development of a country or group of countries. We build two additional series for the periods 1997–99 and 2001–03 (roughly ten and five years from the 2007–08 period). As governments, donors and international institutions are likely to be especially interested in countries with a persistently low, or even diminishing, tax performance, we take a closer look at this group in our analysis.

⁴ Starting with early contributions to the debate (Lotz and Morss 1967), authors have ranked countries according to their ‘tax effort’. With better data and more potent statistical tools at hand, rankings have become more complex in terms of variables observed. For instance, Stotsky and WoldeMariam (1997) construct an index based on GDP shares of agriculture, manufacturing and mining, per capita income and trade. Gupta (2007) develops a ‘revenue performance index’ which uses log GDP per capita (alternatively: GDP share of agriculture), trade, aid and debt. For an insightful critique of the attempts to measure tax capacity and effort, see Bird (1976), who observes that “it is inherently extremely difficult to specify correctly any model of (usable) taxable capacity” (ibid, 253).

⁵ For each of the countries of our sample, data from 2007 and 2008 were averaged and then compiled into one series. For 14 countries (Anguilla, Antigua and Barbuda, Barbados, Cameroon, Dominica, Eritrea, Gabon, Qatar, Oman, São Tome and Principe, Sudan, United Arab Emirates, Uzbekistan, West Bank and Gaza), one of the two observations was missing. In these cases we took the remaining one.

The **second assumption** discussed in this paper relates to regional patterns of tax performance. Even though every country has a tax system which reflects its specific political, social and economic conditions, we would expect some regional factors to exert a measurable influence on the tax performance of individual countries. To give an example, neighbouring countries may compete for private sector investments, forcing them to take the tax levels (on corporate income, trade, etc.) of their competitors into account. Political and cultural exchange or shared religious beliefs may contribute to regionally similar views on the state, its relations to society and the functions it should perform. A common colonial heritage (such as in Latin America or in parts of sub-Saharan Africa) could also lead to a certain assimilation of taxation patterns – even more so if it is connected to specific economic structures and patterns of world market integration (Mkandawire 2010, Daude et al. 2011).

Few studies have explored regional patterns of tax performance. Profeta et al. (2011) examine the relation between political variables and tax revenue, focussing on three areas: Asia, Latin America and new EU-members. Using pooled OLS-regressions with regional dummies they find that “in some cases the relationship between the tax structure and political variables appears to be region-specific” (ibid., 4). Davoodi and Grigorian (2007) distinguish income groups as well as regions, using a sample of 141 countries and the observation period 1990 to 2004. They find some “interesting regional patterns” (ibid., 31), but do not relate findings to theoretical assumptions. Other authors (for instance Jiménez et al. 2010; di John 2008; Le et al. 2008; Burgess and Stern 1993) account for regions in some parts of their analysis, but do not approach the subject in a systematic manner.

The **third assumption** guiding our analysis concerns the relationship between tax and non-tax revenue. Most approaches to the subject assume that governments with ‘easy’ access to alternative sources of finance do not have a strong incentive to engage in cumbersome domestic tax collection. On the one hand, exporters of non-renewable energy sources (oil, gas) and minerals (copper, gold) may not have to achieve high tax ratios in order to finance public services. A state that receives substantial rents from oil or gas exports will feel little inclination to resort to the laborious business of depriving its citizens of some of their income when it can finance its essential functions as things are. The best example of this is the Persian

Gulf states, some of which maintain single-digit tax ratios despite having medium to high per capita incomes.

On the other hand, states heavily dependent on ODA grants may be tempted to refrain from additional domestic revenue mobilization – unless ODA conditions (such as co-financing schemes or tax collection targets) change the incentive structure, or longer-term political perspectives lead governments actively to seek independence from ODA inflows. There is a growing body of research on these issues (Bräutigam and Knack 2004; Knack 2008; Carter 2010; Gupta et al. 2003; Gambaro et al. 2007; Benedek et al. 2011; Clist and Morrissey 2011), but findings are still inconclusive.

The **fourth assumption** concerns the governance dimension of revenue mobilization. A low tax yield is not always the outcome of some kind of error or defective governance. Different societies have different views on what states should do and how much they should cost. Of the OECD member countries, the USA and Japan stand out as having a rather low tax yield, whereas the Nordic countries are famous for their high tax ratio. Neither does our trend line necessarily represent the ‘golden middle’ between under- and overtaxation, nor does every society aspire to become another Sweden or Denmark.

Consequently, we should distinguish between states that collect few taxes because citizens *want* them to have a low tax ratio and those where other aspects may be more important than the political will of the citizens. Factors such as democratic participation, free and fair elections and regime stability determine the capacity of societies to reach political decisions based on the common interest, while such factors as administrative capacity, level of corruption and rule of law determine the capacity of public administrations to implement these policies.

Societies with low levels of governance are typically not in a position to choose and implement a tax system from a common interest perspective. Hence, in cases where low tax performance coincides with low levels of governance we find it hard to believe that the tax ratio is the product of transparent, democratic decision-making and capable public administration. Rather, we would assume that in these cases some powerful groups are imposing a tax system according to their particular interests – or that they are successfully obstructing tax reform initiatives. In addition, we consider it easier in political terms to have a low tax ratio than a

high one. We therefore assume lower levels of governance to be more conducive to lower tax ratios.⁶

To summarize, states with a relatively low or diminishing tax performance do not automatically qualify as ‘bad’ or ‘defective’ cases. It is possible that their tax ratio is low because they enjoy ‘easy’ access to alternative sources of finance, or because societies have chosen to limit the range of state action. Tax performance may also be shaped by specific conditions, such as natural disasters or violent conflicts (Everest-Phillips 2010).

2.1 The data challenge

Gathering data on actual tax revenue collection in developing countries is still a difficult task. For one thing, the informal sector accounts for a significant part of the economic activity of many developing countries (Olken and Singhal 2009; Le et al. 2008). This may lead to effective tax rates and to the tax ratio being overstated (Aizenman and Jinjark 2009). Some states do not report GDP or revenue data at all. Various states have changed to accrual accounting, while many others still rely on cash accounting (though this difference is less relevant to revenue than to expenditure). Furthermore, data series often use different definitions of governments or different classifications of revenues – sometimes simultaneously and without prior explanation.

Levels of government: From the IMF’s Government Finance Statistics (GFS), the standard source of information on public finances in developing countries, we take *general government* (GG) as the broadest category in terms of revenue statistics. It comprises central government (CG), state and local governments, social security funds and non-market non-profit institutions. However, quite a few countries (especially developing countries) report data only on CG (sometimes including social security funds), not on GG. Therefore, many research papers that

⁶ This is in line with findings from other studies. See for instance Cheibub (1998: 365); Garcia and von Haldenwang (2011). Looking at tax systems as an outcome of political choice does not mean to ignore that causation can also go from higher revenue collection to better governance. Several contributions to the debate explore this latter relationship. See Ross 2004; Di John 2009; Mahon 2005; Altunbas and Thornton 2011; Moore 2007; Freeman and Quinn 2012.

consider developing countries use CG data (see, for example, Teera and Hudson 2004; Gambaro et al. 2007; Le et al. 2008).

For our purposes, however, we would favour a different approach, taking into account of all government revenues in as many countries as possible. Subnational governments are important tax collectors in some countries, especially in the higher-income groups, although in most of the low- or lower-middle-income countries they play only a minor role: in 2008, the mean difference between GG and CG tax revenue among lower-middle-income countries was 1.31 per cent of GDP (in those 19 countries that report both data in IMF GFS), while in higher-income countries it was 5.76 per cent (27 countries). Thus, relying solely on CG data would tilt our findings substantially ‘in favour’ of the lower-income countries in our sample.⁷

Classification of revenues: The GFS distinguish four kinds of general government revenue: taxes, social contributions, grants and other revenues. ‘Grants’ refer to grants from international organizations or governments of third countries. ‘Other revenues’ refer to property income, sales of goods and services, fines, voluntary transfers and others. The lines between these categories may be somewhat blurred, as countries interpret them differently. For instance, some countries (such as Australia) do not report social security contributions, since they treat them as taxes.

Against this background we opt for a broad view of tax revenue, taking it to cover taxes and social security contributions. Again, omitting one of these sources would distort the overall picture of tax revenue. Social security contributions are hardly a relevant source of public revenue in low-income countries, but it is obvious that social security is considered a public task in most countries with higher tax ratios. In Germany, for example, more than EUR 80 billion is transferred from the government budget to the public pension system year by year. Therefore, omitting these revenues from our calculations would not be justified.⁸

⁷ Of course, including GG data for only a part of our sample (and CG data for the rest) also produces biased results, albeit on a much smaller scale. In our analysis we check for such bias by adjusting the tax revenue of those countries that report only CG with local tax revenue estimates, using data from Ivanyna and Shah (2011). See Section 3.

⁸ To check for sample bias, we also consider tax revenue without social contributions. We find that the slope of the trend line changes, but there are few changes with regard to the low tax performers’ group. See Section 3 for more details.

Data sources: For GDP per capita, we take data from the World Development Indicators. We consider GDP per capita in constant 2000 US dollars and GDP per capita in constant 2005 *Purchasing Power Parity* (PPP) units. Both variables produce similar results (see Table 1 below). We consider constant 2000 US dollars to be more appropriate for our analysis, because (i) it is a more ‘neutral’ indicator of levels of development (differences between constant US dollars and PPP already take account of differences in development levels due, for instance, to cheaper services in developing countries), (ii) the sample is slightly larger (177 compared to 174 countries) and (iii) the indicator appears to be more transparent, as determining PPP is in itself a complex operation and subject to debate.

For tax revenues, we take data from the following sources (ranked according to priority): (i) OECD, (ii) Eurostat, (iii) UN Economic Commission for Latin America and the Caribbean (ECLAC, or CEPAL for its Spanish name), (iv) IMF GFS GG, (v) IMF GFS CG, (vi) individual country data from IMF ‘Article IV consultation’ and ‘Selected issues’ reports (for observation periods 1997–99 and 2001–03), (vii) Asian Development Bank, (viii) Collecting Taxes database. In the last two sources, the definition of tax revenue is not always clear. We found various cases where GG and CG data were used without distinction, or where social contributions were treated incoherently.

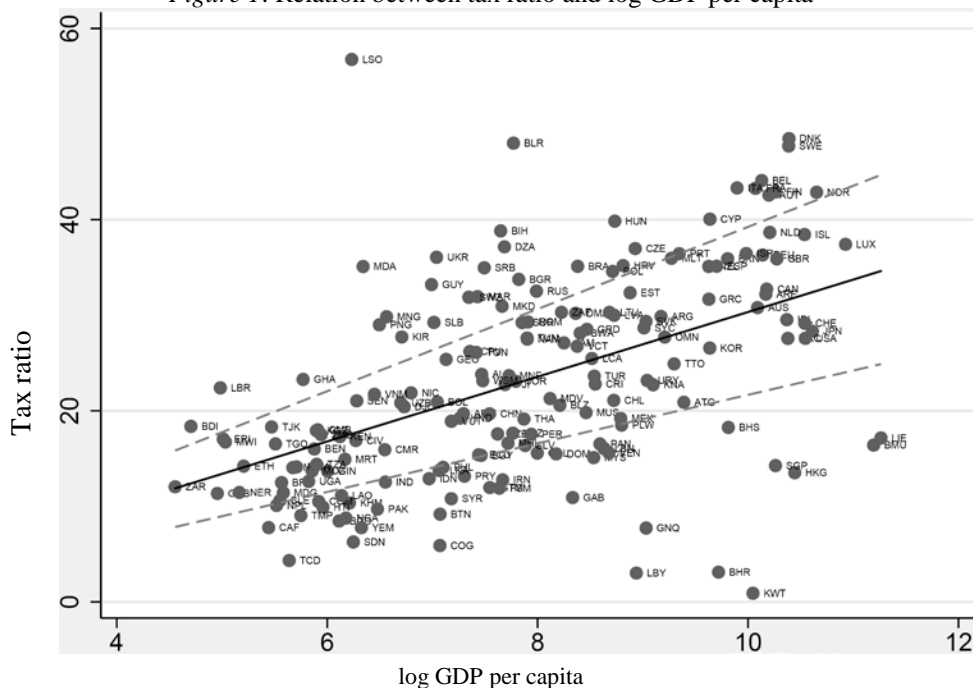
Consequently, there are 189 countries in our sample for the construction of the trend line (see Table I in the Appendix). GDP per capita is available for only 177 of these countries, but the missing data mostly concern small countries and territories in the Pacific Ocean and the Caribbean.

3 Results of the analysis

3.1 Classification of countries

Figure 1 shows a scatter plot of tax ratio (tax revenue as per cent of GDP) versus logged GDP per capita for 177 countries. Table 1 contains the results of the regression analysis. The relationship between tax ratio and log GDP per capita is statistically significant, even though the effect is rather small: in statistical terms, an increase of 10 per cent in log GDP per capita would increase the tax ratio by about 0.34 additional percentage points.

Figure 1: Relation between tax ratio and log GDP per capita



Note X-axis: tax revenue in per cent of GDP (= tax ratio), 2007/08. Y-axis: log GDP per capita in constant 2000 US dollars as of 2008. Source: see Table I (Appendix). The solid black line is the trend line (fitted values). The broken grey lines are the lower and upper boundaries of the 95 per cent confidence interval, i.e. there is a 95 per cent probability that the “real” trend line is located within the range marked by the broken lines. N=177.

Table 1: Tax ratio and log GDP per capita – regressions

Variable	(I)	(II)
log GDP /capita	3.42*** (.45)	4.6*** (.55)
N obs.	177	174
R ²	.27	.3

Note *** – significant at 1 per cent level. Dependent variable: tax ratio as defined in Table I (Appendix). Right-hand side variable: column (I) – log GDP/capita, constant 2000 USD; column (II) – log GDP/capita, constant 2005 PPP – see definitions in Table I. Estimation method: OLS. Standard errors are heteroscedasticity-robust.

With the approach we have chosen, 36 of 177 countries qualify as high tax performers, whereas 41 countries fall into the low tax performing category. The remaining 100 countries are average performers. Table 2 is a list of all countries with their respective distance from the trend line.

Table 2: All countries, distance from the trend line

Above the trend line				Below the trend line			
Lesotho	39.18	Spain	5.68	Oman	-0.04	Philippines	-6.47
Belarus	25.17	Germany	5.37	Benin	-0.36	Sri Lanka	-6.67
Moldova	17.14	Dominica	5.34	Cote d'Ivoire	-0.83	Haiti	-6.74
Denmark	16.69	Cape Verde	4.78	Armenia	-1.51	El Salvador	-6.85
Bosnia & Herzegovina	16.41	Georgia	4.73	Mali	-1.61	Timor-Leste	-6.89
Sweden	15.93	UK	4.50	Rwanda	-1.66	Centr. Afr..	-7.10
Ukraine	15.72	Tonga	4.48	Turkey	-1.84	Mexico	-7.13
Algeria	14.61	Lithuania	4.35	Guinea-Bissau	-1.86	Cambodia	-7.16
Hungary	13.72	Tunisia	4.33	Honduras	-1.87	Indonesia	-7.19
Italy	13.21	Namibia	4.21	Vanuatu	-1.92	Antigua & Barbuda	-7.48
Belgium	13.18	Latvia	3.89	Tanzania	-2.04	Palau	-7.85
Serbia	13.07	Luxembourg	3.79	Ireland	-2.19	Colombia	-8.04
Guyana	13.03	Eritrea	3.63	China	-2.37	Paraguay	-8.08
France	12.57	Vietnam	3.41	Mauritania	-2.43	Nigeria	-8.62
Finland	11.55	Tajikistan	3.33	Niger	-2.47	Bangladesh	-8.70
Austria	11.43	Senegal	3.30	Mozambique	-2.57	Pakistan	-8.71
Mongolia	11.13	Grenada	3.30	Korea, Rep.	-2.66	Dominican Republic	-8.73
Cyprus	10.83	Malawi	3.26	Costa Rica	-2.69	Panama	-9.12
Bulgaria	10.74	Botswana	3.12	Cameroon	-2.72	Iran, Islamic Rep.	-9.71
Papua New Guinea	10.52	Jamaica	2.62	Maldives	-2.75	Lebanon	-9.74
Swaziland	10.50	Greece	2.49	Burkina Faso	-2.81	Syrian Arab Rep.	-10.02
Morocco	10.27	Nicaragua	2.37	Guinea	-3.11	Guatemala	-10.10

Table 2 continued

Above the trend line				Below the trend line			
Brazil	10.19	Argentina	2.24	Switzerland	-3.14	Yemen	-10.12
Czech Republic	10.18	Slovak Republic	2.21	Trinidad & Tobago	-3.15	Malaysia	-10.34
Norway	10.17	Albania	2.01	Uganda	-3.56	Venezuela	-10.35
Liberia	9.09	St. Vincent & Gren.	1.84	Belize	-3.76	Micronesia, Fed. Sts.	-10.47
Slovenia	9.01	Canada	1.66	Madagascar	-3.93	Chad	-11.21
Solomon Islands	9.00	Uzbekistan	1.66	Uruguay	-4.01	Bhutan	-11.27
Russian Federation	8.94	Seychelles	1.59	Thailand	-4.04	Sudan	-11.36
Croatia	8.79	Gambia	1.53	Macao, China	-4.19	Bahamas, The	-11.57
Poland	8.52	Kyrgyz Republic	1.50	Japan	-4.22	Gabon	-13.84
Kiribati	8.51	Togo	1.43	Sierra Leone	-4.63	Congo, Rep.	-14.55
Macedonia	8.48	Samoa	1.31	St. Kitts & Nevis	-4.65	Singapore	-17.09
Portugal	8.22	United Arab Emir.	1.16	United States	-4.75	Liechtenstein	-17.63
Malta	7.98	Djibouti	1.14	Azerbaijan	-4.75	Bermuda	-18.14
Netherlands	7.50	Montenegro	0.98	Chile	-5.01	Hong Kong, China	-18.45
Ghana	7.28	Zambia	0.92	Nepal	-5.05	Equatorial Guinea	-19.42
Iceland	6.15	Bolivia	0.55	Kazakhstan	-5.16	Libya	-23.81
Suriname	6.12	Congo, Dem. Rep.	0.21	Mauritius	-5.39	Bahrain	-26.39
Brunei Darussalam	6.10	Fiji	0.19	Peru	-5.88	Kuwait	-29.72
Israel	6.06	Jordan	0.18	Comoros	-6.01		
Burundi	6.01	Ethiopia	0.14	Marshall Islands	-6.06		
Romania	5.99	Kenya	0.10	Lao PDR	-6.12		
New Zealand	5.92	St. Lucia	0.09	India	-6.12		
South Africa	5.91	Australia	0.03	Ecuador	-6.31		
Estonia	5.72			Egypt	-6.45		

Note Based on the estimate (I) from Table 1, distance in per cent tax revenue/GDP, average of 2007–08. High / low tax performers: values shaded grey.

We propose to call those countries whose tax ratio lies within the 95 per cent confidence interval of the trend line (i) *average tax performers*,⁹ countries with a tax ratio above the 95 per cent confidence interval (ii) *high tax performers* and those with a tax ratio below the 95 per cent confidence interval (iii) *low tax performers*.¹⁰

3.2 Robustness checks and specifications

We performed several robustness checks and looked for alternative specifications of our main variables.¹¹ In this section we discuss determinants of tax performance and alternative tax measures.

Determinants of tax performance: As has been outlined above, GDP per capita is not the only variable researchers take into account when discussing tax effort or tax performance. Other variables typically found in the literature refer to economic structure (above all, GDP shares of agriculture and foreign trade), or to socio-political factors, such as ethnic, linguistic and religious fractionalization.¹² We

⁹ In addition, average tax performers can be distinguished as a function of their location above (average-high) or below (average-low) the trend line.

¹⁰ We consider the confidence interval a more appropriate measure than absolute values, because a specific variation in tax ratio means something different for countries with lower levels of tax revenue as against countries with higher levels. Low-income Burundi is therefore classified as a high tax performer with a tax ratio 6.01 per cent GDP above the trend line, whereas high-income Malta, 7.98 per cent distant from the trend line, is an average tax performer. See Figure 1 and Table 3.

¹¹ For instance, checking for outliers such as Lesotho (high tax performer) or Kuwait, Bahrain and Libya (low tax performers) led to minor changes in the resulting lists, with four countries changing categories in the first exercise and seven countries in the second. Using alternative functional forms (level data of GDP per capita and GDP per capita squared) resulted in much broader lists of low and high tax performers, but did not change the general ranking. See Table II in the Appendix for results. We also ran several semiparametric spline-models to check for more complex non-linear relationships and found that our log-linear model fits the data best.

¹² For the use of agriculture and trade, see for instance Lotz and Morss 1967; Musgrave 1969; Chelliah 1971; Piancastelli 1991; Stotsky and WoldeMariam 1997; Cheibub 1998; Fauvelle-Aymar 1999; Teera and Hudson 2004; Mulligan et al. 2004; Bird et al. 2004; Le et al. 2008; Profeta and Scabrosetti 2010; Mkandawire 2010; Pessino and Fenochietto 2010; OECD et al. 2010; Thies 2010; Ehrhart 2012. Fractionalization has been applied to taxation by Thies 2010; Mulligan et al. 2004; and Timmons 2010, based on the seminal work of Alesina et al. (2003). All in all, some 40-50 explanatory variables can be found in the literature on tax effort or tax performance.

check whether, after controlling for GDP per capita, tax ratio is associated with these factors. We then check whether controlling for these factors results in significant changes in the group of low tax performers.¹³

The share of agriculture in GDP is not significantly associated with tax ratio once we control for GDP per capita. Nevertheless, there is a high degree of multicollinearity between the two variables, confirming findings from other studies (for instance, see Fauvelle-Aymar 1999; Gupta 2007). This leads to an imprecise estimation of coefficients and, hence, to wider boundaries for 'average' tax performance. As a result, the groups of low and high tax performers shrink significantly. Yet, there do not seem to be significant changes in qualitative terms. First, no new country enters the low or high tax performers group after adding agriculture as a determinant. Second, the correlation between residuals from the main regression (only GDP per capita) and the regression with agriculture is almost perfect (0.993). No country from the group of low or high tax performers changes its location with regard to the trend – all 'initial' low tax performers remain below and all 'initial' high tax performers remain above the trend line.

Results are similar with other determinants of tax performance. Trade openness, measured as the sum of exports and imports as a percentage of GDP, is not significant after GDP per capita is controlled for. The changes caused to the groups of low and high tax performers are even smaller than those caused by the share of agriculture in GDP. Ethnic fractionalization of societies seems to be an important variable in assessing tax performance. It remains statistically significant even after controlling for GDP per capita. Yet, including this variable does not significantly change our results: the correlation between the residuals from our main regression and the residuals with fractionalization is still very high (0.93). This means that very few countries change their location with regard to the trend (from above to below, or in the opposite direction), and none of these countries belongs to the group of low or high tax performers.

Alternative tax revenue measures: A broad definition of tax revenue was introduced above, covering general government information (where available) and including social security contributions. There are, however, alternative approaches: (i) a first option would be to use tax revenue without accounting for social

¹³ Descriptive statistics and results of the regression analyses can be found in Tables III and IV (Appendix).

contributions, while (ii) a second option would be to adjust for local tax revenue in those countries that report only CG data.

(i) In the first case (excluding social contributions) the trend line becomes flatter, as expected, since many high-income countries rely heavily on social contributions, whereas many developing countries do not report social contributions at all. As a result, many European countries drop out of the group of high tax performers, to be replaced by countries with lesser reliance on (or different treatment of) social contributions (for example, Botswana, Namibia, Georgia, Iceland and Malta). At the same time, the list of low tax performing countries changes only slightly: the Philippines, Dominican Republic, Lebanon, Sri Lanka, the Bahamas and Palau move into the average performers group, whereas Costa Rica, Madagascar, Greece, Sierra Leone, El Salvador and Ecuador join the low tax performers group.

(ii) The second alternative is to adjust the tax ratio for local tax revenue in the case of those countries that report only CG data. Non-reporting of GG data is clearly skewed towards lower income countries.¹⁴ But is the difference between CG and GG relevant to them?

- Data from Ivanyna and Shah (2010) reveal that, in 2005, the average subnational government (SNG) expenditures of countries reporting GG data was 23.7 per cent of total expenditures (comparable to total revenue). For countries that only report CG data, the figure is 9.7 per cent, and for countries whose data we derive from ASDB or ColTax, it is 9.6 per cent.
- Subnational tax revenues are typically much lower than expenditures, especially in the case of the poorer countries. Ivanyna and Shah (2010) have estimated the *vertical gap* – the difference between a country's SNG expenditures and own SNG revenues (excluding intergovernmental transfers). According to these estimates, SNG in countries which report GG finance 56 per cent of their expenditures with own revenues. SNG in 'CG only' countries finance 57 per cent, and SNG in 'AsDB and ColTax' countries finance 49 per cent.

¹⁴ Of the 113 countries in the sample (excluding AsDB and ColTax sources), 35 report only CG data. High-income countries: 2 of 37; upper-middle-income countries: 4 of 23; lower-middle- and low-income countries: 29 of 53.

- To give an example, the average tax revenue of ‘CG only’ countries in our sample was 16.3 per cent of GDP in 2007/2008. If their presumed GG tax revenues were comparable to the GG expenditures reported by Ivanyna and Shah (2010), local government in an average ‘CG only’ country would collect $9.7 \text{ per cent} * 0.57 = 5.5 \text{ per cent}$ of GG tax revenues. This means that, by using CG data, we are underestimating the actual GG tax revenue for an average ‘CG only’ country by $16.3 \text{ per cent} * 0.055 = 0.9 \text{ per cent}$. Even OECD and Eurostat data often differ by more than 0.9 per cent.

As expected, the results of the regression with the ‘adjusted’ data are practically the same as in the main specification (even the point estimates are very close). Colombia and the Philippines change their position marginally (from ‘close to average’ low tax performers to ‘close to low’ average tax performers). Yet there is one major change: India makes a significant leap from the low to the average tax performing group: as a federal state, it has a much higher degree of fiscal decentralization than other developing countries. However, since the data we use in this exercise stem from 2005 and earlier, and there is no direct measure of local tax revenue for CG states, we do not use this adjustment in the main specification.

Different effects in different income groups: Several studies suggest that the relationship between tax ratio and level of development is different for poorer countries (Tanzi 1992; Burgess and Stern 1993; Piancastelli 2001; Teera and Hudson 2004; Clist and Morrissey 2011). To address this question¹⁵ we split the sample in two: countries with lower GDP per capita (less than the median) and countries with higher GDP per capita (more than the median). We find that the slope is flatter for richer countries (the point estimates are economically different), which is not surprising, given that we use logged GDP. Yet the difference is not significant in statistical terms (at a 5 per cent significance level).

A second way of identifying non-linearities in the relationship between tax ratio and income is by way of regressing the tax ratio on income group dummies, as classified by the World Bank. The group of low-income countries is chosen as the baseline. The biggest jump is from the low-income to the lower-middle-income group, after which the relationship flattens and then jumps again from upper-middle-income to high-income countries. This pattern supports our choice of log

¹⁵ The results can be found in Table V in the Appendix.

GDP per capita as a proxy for economic development (since it also assumes a similar non-linearity between income and tax ratio).

3.3 Tax performance: changes over time

Also of interest to our paper are changes in tax performance over time. The sample includes 1905 observations for tax revenue in the period 1997–2008. There is at least one non-missing observation in 193 countries, 10 being the average number of available time observations for a country. Most of the missing observations are in sub-Saharan African and small Caribbean countries. In general terms, data show that tax revenue is increasing slightly over time, in line with GDP per capita, which is consistent with our story.

Poor countries are underrepresented in the sample in the earlier observation periods. This raises concerns about sample selection and the possibility of comparing the relative tax performance of a country over time: If samples from previous observation periods were qualitatively different from the period 2007–08, a country's change in position vis-à-vis the trend line could be due to sample selection rather than to its own development.

However, the fact that missing observations before 2007 mostly concern poor countries, does not necessarily mean that those countries are low tax performers. It is impossible, of course, to test this claim directly (since the relevant data are the data that are missing), but there are indirect checks.¹⁶ For instance, we analysed variables such as the lead selection indicator and the number of years that a country *i* reports tax revenue. We also reran the main regression for our 2007–08 sample, but excluded those countries that did not report in 2006. Finally, we assumed that there was indeed a sample selection problem, and reformulated our main specification with only those countries that reported data in 1997–99 as well as in 2001–03 (158 countries, not shown in Table IV). The results did not significantly differ from our original argument, which means that there is no evidence of sample selection.

Table 3 summarizes the changes of category for each period – 1997–99 and 2001–03 – compared to 2007–08. We apply the same technique as for 2007–08 to

¹⁶ See Table VI in the Appendix for the results.

Table 3: Tax performance progress matrix: 1997–99 and 2001–03 vs. 2007–08

	Low tax perf. 2007–08	Average tax perf. 2007–08	High tax perf. 2007–08
Low tax perf. 1997–99	SGP, DOM, LBN, BTN, COG, URY, GTM, BHR, IRN, VEN, KWT, HKG, BHS, LBY, GNQ, PLW, KHM, SDN	ECU, MEX, SLV, ARE, CHN, MAC, BRN, OMN, KAZ	none
Average tax perf. 1997–99	PRY, PAN, COL, YEM, PAK, BGD, NPL, MYS, PHL, SYR, IND, FSM, LAO, HTI, IDN, LKA, TCD, CAF, COM, NGA	71 countries	BRA, MAR, MNG, CYP, SLB, PRT, LBR, KIR, PNG, RUS
High tax perf. 1997–99	none	SVK, LTU, EST, UZB, NAM, LVA, ROM, ERI, MWI, NLD	21 countries
Low tax perf. 2001–03	KWT, BHR, PAN, IRN, COG, HKG, BTN, FSM, BGD, HTI, VEN, DOM, KHM, GTM, LBN, URY, SGP, GNQ, SYR, LBY, BHS	CHN, OMN, MEX, MAC, SLV, MDV, PER	none
Average tax perf. 2001–03	TMP, PAK, LKA, PLW, NPL, PHL, MYS, COL, IDN, IND, LAO, COM, NGA, TCD, CAF	76 countries	LBR, SLB, CYP, KIR, PRT, MAR
High tax perf. 2001–03	none	MWI, VNM, SVK, ERI, UZB, ROM	26 countries

Note: The same technique as for 2007–08 (see Section 3) is applied to identify groups of low, average and high tax performers in 1997–99 and 2001–03

identify low, average, and high tax performers in each period, using the 95 per cent confidence interval. As can be seen, a total of 53 countries changed categories

between 1997–99 and 2007–08. Out of these, 32 registered a downward trend, with 21 moving from average to low and 11 from high to average tax performance. In contrast, 21 countries improved their relative position, with 11 moving from low to average and another 10 from average to high tax performance. Again, these changes do not necessarily imply an increased effort to collect taxes (or the lack of it) in each individual case. In the growth period from 2003 to 2008 in particular, global economic activity helped many countries to improve their domestic revenue collection without major interventions in tax policy or administration. But some countries may have benefited more from this situation than others.

As a result, several countries changed their relative position in the world distribution of tax performance, but not their absolute performance. Nepal, the Central African Republic, Eritrea, Malawi and Haiti increased their tax ratio over time without positive changes in GDP/capita and yet ended up in the low performing group. These countries did make progress in tax collection, but not as fast as the world average. With less certainty, the same can be said of Sri Lanka, the Philippines, Indonesia, Vietnam, Romania, Bangladesh and Cambodia.

Regional patterns

The qualitative analysis reveals some regional patterns. As can be seen, many Latin America and Caribbean countries find themselves below the trend line, with Guatemala, Venezuela, Paraguay, Panama, the Dominican Republic and Colombia in the group of low tax performers. The only high tax performers in this region are Brazil and Guyana. Another part of the world where tax performance is particularly low is South and Southeast Asia. Bangladesh, Pakistan, Malaysia, Cambodia, Indonesia, Laos, Sri Lanka, India, Nepal and the Philippines are among the low performers. In this part of the world, high tax performers are virtually absent (Papua New Guinea and a few small island states constitute exceptions).

In contrast, Africa shows some mixed results, with countries such as Burundi, Liberia, Morocco and Algeria being among the high tax performers, and countries such as Chad, Sudan, the Central African Republic and Nigeria as low tax performers. Finally, average-high and high tax performance predominates in Western Europe and in many formerly socialist states of Eastern Europe and the former Soviet Union. The most important high-income countries with tax ratios below the trend line (but still within the 95 per cent confidence interval) are the USA, Japan, Ireland and Switzerland.

Table VII (Appendix) presents the results of pooled OLS and fixed effects regressions of country and regional tax ratios between 1990 and 2008 on a world-wide scale. It shows a strong statistical relationship between the tax ratio of individual countries and the average tax ratio of their respective region. The magnitude of the relationship is weaker though still strongly significant if we include country fixed effects in the panel. These findings should not be over-interpreted,¹⁷ but they lend further support to the hypothesis that regions do matter.

Even though the regional setting appears to be a relevant factor for the tax performance of individual countries, we cannot be sure of which causalities lie below the observed correlation. Our guess would be that the relationship is driven by different causal factors in each region. When looking at individual regions, however, it is much more difficult to establish statistically significant profiles, since the sample sizes are much smaller and every region has its individual outliers. This effect becomes apparent from the box plot shown in Figure 2.

The grey boxes indicate the central 50 per cent of countries in each region (with the regional mean marked by the horizontal line within each box), while the upper and lower T-bars refer to the sample's upper vs. lower 25 per cent. As can be seen, Europe and Central Asia is the only region with more than 75 per cent of all countries above the trend line. However, all the other regions have overlapping values, the only exception being South Asia, which, as a region, is located below the European and Central Asian region. The MENA region shows the broadest spread of tax performers (including, of course, the three outliers Bahrain, Kuwait and Libya). Latin America / Caribbean provide an interesting picture, with countries above the regional mean being quite heterogeneous and countries below the mean showing a high degree of uniformity.¹⁸

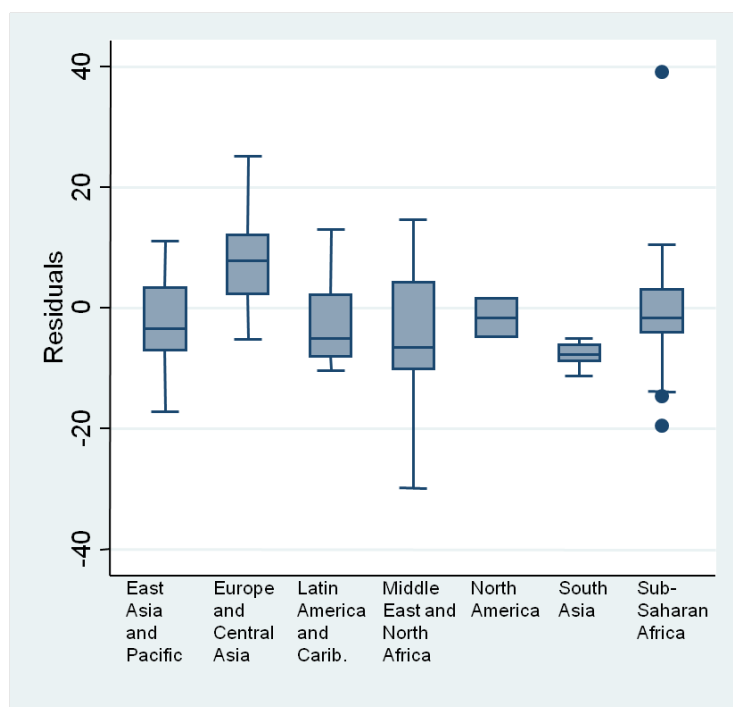
Some regional patterns in changes over time are also worth mentioning. For instance, among those who improved their performance are two transformation

¹⁷ Teasing out causal relationships between regions (or other spatial variables, see Beck et al. 2006) and tax performance would require a much more refined statistical model. Developing such a model lies beyond the scope of this paper.

¹⁸ We test for differences between regions by running OLS with regional dummies on our 2007-08 data, taking Latin America & Caribbean as the numéraire. See column (iv) in Table VII, Appendix. The results confirm the findings presented above.

countries in Eastern Europe and Central Asia: Kazakhstan and Russia. On the

Figure 2: Distance from the trend line: regional averages



Note Based on the estimate (I) from Table 1, distance in per cent tax revenue/GDP, average of 2007–08. The graph only includes countries with a population size above 500.000.

other hand, six countries in that region changed to lower categories (Slovak Republic, the Baltic states, Romania and Uzbekistan). Many South and Southeast Asian countries also lost ground and moved to the low tax performers group, examples being Nepal, Pakistan, Bangladesh, Laos, the Philippines, Indonesia, India, Sri Lanka and Vietnam. An important exception is China, a country that changed from low to average performer. Similarly, nine sub-Saharan African countries moved to lower categories (e.g. Chad, the Central African Republic, Nigeria, Malawi and Namibia), while Liberia alone went from average to high performance.

In Latin America and the Caribbean, three countries moved from average to low tax performance (Paraguay, Haiti and Colombia), while four (Ecuador, Mexico, Peru and El Salvador) changed from low to average and one (Brazil) from average to high performance.¹⁹ In the Middle East / North Africa (MENA) region, three countries managed to move to higher categories (the United Arab Emirates, Morocco and Oman), while Syria and Yemen joined the low performance group.

An increase in non-tax revenue could have been a major reason for the decline in tax performance of Malaysia, Colombia and Vietnam. The Central African Republic, Malawi and Haiti experienced significant increases in ODA grant inflows in the period considered, which could be an indicator of the substitution of foreign aid for tax effort in these countries. For the remaining countries, changes in ODA grants (in per cent of GDP) were either insignificant or even negative.

3.4 Alternative sources of revenue

As pointed out in Section 2, governments finance some of their expenditures from revenue sources other than taxation. Major alternative sources are property income, which also includes dividends and profit withdrawal from state enterprises, and grants from foreign governments and international organizations. ODA grants include direct transfers to governments, transfers to other stakeholders and debt relief. They may serve as substitutes for domestic revenue mobilization either through direct budget support or through a reduction in expenditure needs for programs directly funded by ODA. In addition, governments may engage in borrowing to raise funds. Our aim in this section is to explore whether low tax performers use alternative revenue sources and what sources they ‘specialize’ in.

In 2007–08 only five of 41 low tax performers – Timor-Leste, Libya, Kuwait, the Republic of Congo and Equatorial Guinea – registered government revenue above the world average (32.9 per cent of GDP),²⁰ but 16 countries achieved

¹⁹ It should be noted, however, that several sub-Saharan African and smaller Caribbean states were not included in the analysis because of the lack of data.

²⁰ The regression results presented in columns (i) and (ii) of Table VIII (Appendix) show that the coefficients on total government revenue and expenditure are negative and statistically significant controlling for GDP per capita. This means that, on average, low tax performers obtain lower revenues and spend less than the rest of the countries.

above-average rates of non-tax revenue (total revenue minus tax revenue, the world average being 10.1 per cent of GDP). For some countries, the obvious reason for this is that their governments collect most of their revenue from state-owned enterprises dedicated to the extraction of natural resources (mainly oil) – Libya, Kuwait and Bahrain being the most prominent examples.

Low tax performers do not, on average, receive a great deal of foreign aid.²¹ More than a half of them (23) finance less than 1 per cent of GDP with ODA grants. Only six of the 41 countries – Timor-Leste, Micronesia, Palau, the Central African Republic, Haiti and the Comoros – score higher than the world average (6.7 per cent of GDP) for ODA grants. Out of the 16 high non-tax revenue countries mentioned above, six (Timor-Leste, Micronesia, the Comoros, Bhutan, Chad and Sudan) receive more than 3.4 per cent of GDP (half the world average) in ODA grants. The remaining ten countries obtain non-tax revenue from other (domestic) sources.

The pattern described here is further supported by the net debt flows of low tax performers, even though the statistical evidence is less clear (see Table VIII, column iii, Appendix). Out of the ten high non-tax revenue countries with low ODA levels, only Gabon received external loans in substantial amounts (11 per cent of GDP in 2007–08). From the group of countries with high non-tax revenue and high ODA inflows, Bhutan and the Comoros stand out because they obtain large loans in addition to grants. Borrowing is also an important source of revenue for Lebanon (10 per cent of GDP in 2007–08), being an average country as to non-tax revenue. Still, only in the cases of Lebanon and Gabon loans could be considered a real alternative to tax revenue in 2007–08.

3.5 Governance levels

The size of the public sector and the quality and quantity of public services may reflect structural constraints, but they may also be the outcome of choice. If a country is governed in a democratic and transparent manner and if the government implements public policies effectively, revenue mobilization may not be a major issue, even if the country has a low tax ratio. Yet we suspect that in a majority of

²¹ The coefficient on ODA grants in Table VIII (column iv) is negative (though not statistically significant), indicating that on average low tax performers do not get more ODA than other countries.

cases low tax performance coincides with below-average governance ratings, especially in lower-middle-income and low-income countries.

We consider several governance indicators to analyze low tax performers in this respect. First, we take the Polity IV democracy / autocracy index (POLITY2) and the World Governance Indicators (WGI) Voice and Accountability index to determine whether political decision-making is democratic and participatory. Then we use the WGI Government Effectiveness dimension to see whether public policies are implemented effectively. We also check whether the durability of political regimes has a bearing on tax performance – which, from our findings, does not seem to be the case. On average, low tax performers score significantly lower than the rest of the world in all the governance indicators we observe.²²

- According to the **Polity IV democracy index**, 13 of 35 countries qualify as ‘democracies’²³ in this group. The Comoros, India and Panama with a score of +9 are followed by the Dominican Republic, Guatemala, Indonesia, Paraguay and the Philippines with a score of +8. Colombia, Lebanon and Timor-Leste score +7, Nepal and Sri Lanka +6. A total of 15 countries fall into the “anocracy” category, while seven countries qualify as outright autocracies. For those 22 countries with a score below +6, we would not have much confidence in the common interest orientation of the political decision-making process, but detailed political analysis may prove us wrong.
- The results on the **WGI Voice and Accountability** index are even more telling.²⁴ Only nine countries achieve a higher-than-average rating (above

²² Regression results are presented in Table VIII (Appendix), columns (v) to (viii). The individual ratings are presented in Table IX (Appendix).

²³ As the Polity IV index covers only countries with a population above 500,000, there are data on only 35 of the 41 low tax performing countries. The index assigns scores ranging from +10 to -10. (i) Countries with a score of +10 are called “full democracies.” (ii) Those ranging from +9 to +6 are “democracies.” (iii) Scores from +5 to +1 refer to “open anocracies” – an “anocracy” being a neither fully democratic nor fully autocratic regime with only a limited ability to provide public services and ensure its own survival.. (iv) Countries with a score from 0 to -5 are classified as “closed anocracies,” and (v) those with scores from -6 to -10 are “autocracies.” See Marshall and Cole (2009: 8-12) for the description. For the data, see www.systemicpeace.org/inscr/inscr.htm (accessed 03.11.2011).

²⁴ The index covers all our low tax performers with the exception of Palau. It assigns a score between approx. +2.5 and approx. -2.5, with the mean at zero and the standard deviation at one. See Kaufmann, Kraay and Mastruzzi (2009: 15). The data can be found at

zero), and five of them are small high-income countries²⁵ not included in the Polity IV index (such as Liechtenstein, Bermuda and the Bahamas). Of the larger countries, only four (Panama, India, the Dominican Republic and Timor-Leste) score better than the mean. Twenty countries range between zero and -1, and eleven more lie between -1 and -2.5. The overall picture produced by the two indices thus suggests that only a minority of the low tax performers may have decided on their tax systems from a common interest perspective.

To assess whether a society has the tax system it wants, it is not enough to consider the political process. Governments must also be able to implement the policies that have been adopted in an orderly and transparent way. Where this is not the case, it can be assumed that taxpayers (especially the wealthier and more powerful ones) are finding ways to evade or avoid taxes and that tax laws are not being properly enforced.

From the **WGI Government Effectiveness Index** we deduce that only a few low tax performers have a capable public sector. Thirteen of 40 countries achieve scores above zero (though India, the Philippines and Colombia only by a narrow margin). They include several small high-income countries mentioned above as well as some rather non-democratic (or even blatantly authoritarian) states such as Singapore, Malaysia, Bahrain, Bhutan and Kuwait. Two countries, Colombia and the Philippines, qualify as “democracies” in the Polity IV index and are rated above the mean in terms of Government Effectiveness, but register below-average scores on the Voice and Accountability Index. They could be considered borderline cases.

Consequently, just two countries (Panama and India) score positively in all three indicator sets, and neither of them is a typical developing country. In fact, of the lower-middle-income and lower-income countries with low tax performance, India is the only one with a high governance ranking, and it would most probably jump to average tax performance if subnational tax collection were taken into account.

Checking for two other WGI indices (Corruption and Regulatory Quality) as possible proxies for public-sector capability shows little difference – the correlation between these indices and Government Effectiveness is almost perfect.

<http://info.worldbank.org/governance/wgi/index.asp> (accessed 10.11.2011) .

²⁵ With the exception of Micronesia, which is an upper-middle-income country.

Only Bhutan scores higher than the mean in Government Effectiveness, but has a lower score for regulatory quality. Colombia and Panama register high levels of corruption according to the WGI. Obviously, corruption is a major factor for tax administration and tax compliance. If we took this finding into account, our “group” of high governance, low tax performers would be narrowed down to India plus the Philippines as a borderline case.

An analysis of the other indicators shows that none of the low tax performers combines high non-tax revenues with high levels of governance. This finding is consistent with the general perception that rentier states (with high non-tax revenue) are usually “cursed” by low levels of governance and democracy. It is also notable that the 17 low tax performers with significant grant levels (above 1 per cent of GDP) score low in terms of governance. In contrast, of the 23 countries with low levels of grants, 12 achieve above-the-average ratings in at least one of the WGI indicator sets, Government Effectiveness and Voice and Accountability.

Finally, we analyse whether countries face circumstances that may inhibit tax collection, regardless of the government’s political will. In particular, we consider the number of battle-related deaths as a proxy for civil unrest or war in a country, and the number of displaced persons as a proxy for major humanitarian catastrophes (e.g. natural disasters or violent conflicts).²⁶ Both indicators fail to produce statistically significant results (Table VIII, columns xi and xii), but it appears that special circumstances may have an influence on tax performance in several countries, including Sri Lanka, Chad, the Central African Republic, Pakistan, Sudan, Timor Leste and Colombia.

²⁶ Four of 22 countries with low non-tax revenue and low levels of governance suffered from armed conflicts in 2007-08: Sri Lanka (number of victims: 0.3 per thousand of population), Chad (0.09), Pakistan (0.03), Sudan (0.01). At the same time, nine countries in this group reported displaced persons: Central African Republic (4.6 per cent of the population), Timor-Leste (3.66), Sudan (3.0), Sri Lanka (2.4), Chad (1.6), Lebanon (1.6), Yemen (0.4), Nepal (0.2), Pakistan (0.1). Of the other countries, only one (Colombia) suffered significant losses in armed conflicts in 2007-08 (0.06 per thousand), along with a significant number of displaced persons (6.7 per cent of the population).

4 Conclusion

The findings presented in the previous section allow us to discuss low tax performing countries with reference to their regional location as well as their (i) levels of non-tax revenue, (ii) ODA grants and (iii) governance. Looking at the latter three indicators, it is possible to identify three relatively distinct groups of low tax performing countries:²⁷

- those countries that have high non-tax revenue and low ODA grants combined with low levels of governance: Libya, Kuwait, Equatorial Guinea, Bahrain, Gabon, Nigeria, Iran, Venezuela and Colombia;
- those with comparatively high levels of governance and low non-tax revenue: the Bahamas, India, Bermuda, Liechtenstein, Panama and Hong Kong. Three other countries with low non-tax revenue and above-average scores in at least one of the two WGI indexes (Voice & Accountability, Government Effectiveness) can also be ascribed to this group, i.e the Dominican Republic, Malaysia and Singapore;
- and a third group comprising 22 countries with low levels of governance, low non-tax revenue and, in most cases, relatively high levels of ODA grants or external borrowing, though both indicators may still be low compared to the world average.

Reasons for the first group's low tax performance are relatively clear: their high non-tax revenues provide them with no real incentive to engage in tax collection, while at the same time low levels of governance stand in the way of rapid improvements in tax administration. As for the second group, it can be argued that countries have no preference for collecting much in the way of taxes, as indicated by comparatively high governance levels. Furthermore, almost all countries in this group are high-income or upper-middle-income countries. India is the only lower-middle-income country in this group, and it would almost certainly not be a low tax performer if its subnational tax collection was taken into account.

²⁷ As shown above, among the 41 low tax performing countries we find 16 countries with high (above-average) rates of non-tax revenue, the world average standing at 10.1 per cent of GDP in 2007–08. A total of 18 countries received significant (more than 1 per cent of GDP) amounts of ODA grants. Finally, only six countries achieved high governance levels, i.e. above-average scores in both WGI dimensions, the Voice & Accountability as well as the Government Effectiveness Index.

Regarding the third group, reasons for low tax performance are less apparent and potentially more diverse. Possible explanations include a lack of capacity (ineffective tax administration) or tax effort (for instance, resistance to tax policy reform, high levels of “permitted” tax evasion), at least for those countries with a poor government effectiveness record. Various countries in this group also receive ODA grants well above the world average (Timor-Leste, Micronesia, the Comoros, the Central African Republic and Haiti). In these cases, crowding-out effects caused by ODA funding could be one reason for low tax performance.

It should be noted that, according to Table 3, 16 out of the 22 countries belonging to the third group were average tax performers ten years ago. Most of them are located in South or Southeast Asia and sub-Saharan Africa. In a period of growth and expanding public revenues worldwide, it appears that these states were in a weak position to improve their fiscal standing in line with the rest of the world.

At the same time, the results indicate that regional patterns may play a role in at least some parts of the world. The significance of regional patterns found in the preceding section corroborates previous research and lends additional weight to those initiatives that raise the issue of domestic revenue mobilization on a multilateral level, such as the Inter-American Center of Tax Administrations (CIAT, in its Spanish acronym) and the newly established African Tax Administration Forum (ATAF). Development partners should take regional patterns into account, even if other factors such as natural resource endowments or aid dependency tend to dominate the development agenda.

Some Asian societies are known to have a preference for small states, low levels of regulation and free markets. We have identified many low-tax performers in this region, and most of them worsened their tax performance since 1997 or 2001. With regard to the quality of the political regimes, however, the region has seen some important improvements over the past twenty years. Countries such as Nepal, Malaysia, Philippines, Indonesia and Sri Lanka changed from average to low tax performance, but belong to the group of “democracies” in the Polity IV index. This suggests that at least part of the story of tax performance in this region could include the “democratic choice of society” not to increase the tax take of the state.

In Latin America, the prevalent political mood in recent years has been to expand the size of government and step up social spending. Many countries saw

the rise (and a few, the demise) of social democratic or socialist governments with a redistributionist political agenda. In terms of tax performance, however, progress has been rather slow. Several South American countries have achieved higher tax ratios in recent years, but mostly because of the favourable economic development and its impact on corporate income tax and value added tax revenues. Concerning the tax structure, Latin America appears to be stuck in its elitist and autocratic past (Jiménez et al. 2010).

In Eastern Europe the story is different. The transition from socialism to market economy naturally involved a decreasing size of the state, accompanied by higher levels of democracy throughout the region. In addition, over the last decade many countries in this region embarked on a fierce tax competition with each other and with their Western European neighbours, driven by increased capital mobility within the region and East-bound investment flows in the manufacturing sector. As a result, most of the countries in the region decreased their income taxes and many introduced flat tax schemes.

Africa and the MENA region have probably the most complex tax performance patterns. In both regions the trend lines we obtained from regional regression analysis seem to be dominated by a handful of outliers, in particular some resource-rich countries that do not collect taxes but rather profits from their state-owned corporations. Gabon and Equatorial Guinea are the most prominent examples in Africa, Bahrain, Kuwait and Libya in MENA. Some other countries in MENA, for instance the United Arab Emirates or Oman, classify their oil-related government revenues as taxes. This makes them excellent tax performers. In Africa, there does not seem to be a clear relationship between tax revenue and level of development. Most countries in this region are very poor and collect very little taxes. They tend to have weak tax collection capacities and it seems that the differences in tax revenues between countries in the region stem mostly from differences in the countries' historical and present exposure to global markets via the natural resources they export or the supply of labour they provide (Mkandawire 2010).

More reliable data on many countries would be necessary if this type of analysis was to be expanded to include, for example, sub-national revenues and the characteristics of tax administration. International cooperation can play an important role in this context, for instance regarding the modernization of customs systems. Several new benchmarking and assessment initiatives undertaken by the

World Bank, the IMF and others point in this direction (see OECD 2012). Recent initiatives to broaden the PEFA on tax matters, to gather data on developing countries' tax efforts (see OECD et al. 2010), and to expand existing time series will without doubt contribute to further improving the data situation.

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Appendix

Table I: Tax ratio and log GDP per capita – descriptive statistics

Name	Data source	N obs.	Mean	St. dev.	Min	Max
Tax ratio	final	189	23.04	10.77	0.9	56.76
“	OECD	30	35.59	7.12	19.2	48.48
“	Eurostat	30	37.84	5.72	28.9	49.45
“	CEPAL, GG	7	26.15	10.43	10.9	42.35
“	IMF GFS,	71	31.11	11.57	0.9	71.2
	GG					
“	CEPAL, CG	20	17.07	4.5	9.85	26.46
“	IMF GFS,	102	24.22	10.65	0.9	70.29
	CG					
“	ASDB	40	18.51	3.95	8.3	22.72
“	ColTax	189	20.09	9.13	0.9	51.73
Tax ratio, no soc. contr.	All above	189	20.27	8.75	2.69	60.44
Tax ratio, adjusted	All above, Ivanyna and Shah (2011)	189	23.07	10.69	0.9	56.76
GDP per cap., USD	thousands, WDI	185	8.69	13.22	0.1	77.88
GDP per cap., PPP	thousands, WDI	177	12.28	13.79	0.29	73.03

Note Abbreviations: GG – general government; CG – central government; OECD – Organisation for Economic Co-operation and Development; CEPAL – UN Economic Commission for Latin America and the Caribbean (= ECLAC); IMF GFS – International Monetary Fund’s Government Finance Statistics; AsDB – Asian Development Bank; ColTax – Collecting Taxes. For all sources, tax ratio is tax revenue for general government (unless otherwise specified), with social contributions included, average of 2007 and 2008, in per cent of GDP. AsDB and ColTax do not specify their definitions. Tax ratio, adjusted – CG data adjusted for local revenue, according to Ivanyna and Shah 2011. GDP/capita, USD – GDP per capita in constant 2000 US dollars, thousands, average of 2007 and 2008. GDP/capita, PPP – GDP per capita in constant 2005 PPP units, thousands, average of 2007 and 2008.

Table II: Tax ratio and log GDP per capita – alternative specifications

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
log GDP/capita	3.56*** (.43)	3.73*** (.42)			2.03*** (.36)	3.28*** (.45)
GDP/capita			.29*** (.1)	.93*** (.13)		
GDP/capita ²				-.01*** (.00)		
N obs.	176	174	177	177	177	178
R ²	.31	.33	.12	.25	.14	.24
out, low tax perf.	NPL	none	none	LIE, BMU	PHL, LBN, BHS, PLW	DOM, LKA, IND, PHL
in, low tax perf.	SLV	MEX, MHL, EGY, ECU	ATG, SLV, 45 countries	43 countries	CRI, GRC, SLV, ECU	MDG, SLE, 18 countries (Europe)
out, high tax perf.	none	PRT	none	FIN, NOR, AUT	18 countries (Europe)	none
in, high tax perf.	ERI, MLT	none	39 countries	33 countries	15 countries	none

Note Column (i): regression excluding Lesotho. Column (ii): regression excluding Kuwait, Bahrain, Libya. Column (iii): GDP/capita instead of log GDP/capita. Column (iv): GDP/capita squared. Column (v): tax ratio excluding social contributions. Column (vi): local tax revenue added for countries with only CG data. *** - significant at 1 per cent level. Dependent variable: columns (i), (ii), (iii), (iv) - tax ratio as defined in Table I; column (v) - tax rev. excluding social contributions; column (vi) - tax ratio, adjusted, see Table I for definition. GDP/capita is in constant 2000 USD. Estimation method: all columns - OLS. Standard errors are heteroscedasticity-robust in all columns. In/out comparison is with the lists in Table 3.

Table III: Alternative determinants of tax performance - descriptive statistics

Name	Data source	N obs.	Mean	St. dev.	Min	Max
Agriculture / GDP	Per cent GDP, WDI	157	13.09	12.57	0.1	58.15
Trade / GDP	Per cent GDP, WDI	169	100.7	56.9	27.15	439.15
Ethnic frac.	Alesina et al. (2003)	172	.45	.25	0	.93
Linguistic frac.	Alesina et al. (2003)	166	.39	.28	0	.92
Religious frac.	Alesina et al. (2003)	173	.43	.23	0	.86

Note Abbreviations: WDI - World Development Indicators (World Bank). For all variables averages of 2007 and 2008 are used.

Table IV: Alternative determinants of tax performance

	(i)	(ii)	(iii)	(iv)	(v)
log GDP/capita	3.39*** (1.09)	3.39*** (1.09)	3.71*** (.48)	2.75*** (.67)	2.44* (1.28)
Agriculture / GDP	-.09 (.12)	-.09 (.12)			-.09 (.13)
Trade / GDP			-.00 (0.02)		.02 (.02)
Ethnic frac.				-16.1*** (5.17)	-13** (5.36)
Linguistic frac.				2.06 (3.92)	.5 (4.12)
Religious frac.				4.82 (3.65)	5.94 (3.99)
N obs.	151	151	161	150	131
R ²	.33	.33	.29	.4	.44
Corr. residuals	.993	.993	.999	.931	.935
out, low tax perf.	27 countries	28 countries	IND, NPL, PLW, PHL	18 countries	29 countries
in, low tax perf.	none	none	none	none	none
out, high tax perf.	30 countries	31 countries	HRV, POL, PRT, SVN	20 countries	28 countries
in, high tax perf.	none	none	none	MWI	none
- to +, low tax perf.	none	none	none	none	none
+ to -, low tax perf.	none	none	none	none	none

Note * - significant at 10 per cent level, ** - significant at 5 per cent level, *** - significant at 1 per cent level. Column (i): controlling for Agriculture/GDP, only coefficient on log GDP/capita is considered random. Column (ii): controlling for Agriculture/GDP, all coefficients except the one on constant are considered random. Column (iii): controlling for trade/GDP. Column (iv): controlling for ethnic, lingual, and religious fractionalization. Column (v): controlling for all above factors. Dependent variable - tax revenue as defined in Table I. Estimation method: all columns - OLS. Standard errors are heteroscedasticity robust in all columns. Corr. residuals is correlation between residuals in the current regression, and those in the main regression from Table 1. "- to +, low tax perf." - low tax performers, which moved from below to above trend as compared to the main regression. "+ to -, high tax perf." - high tax performers, which moved from above to below trend as compared to the main regression. In/out comparisons is with the lists in Table 3.

Table V: Tax ratio and log GDP per capita – poor vs. rich countries

Variable	(i)	(ii)	(iii)
log GDP/capita	4.38*** (.93)	3.43*** (1.21)	
high income			16.25*** (1.8)
upper middle income			11.01*** (1.46)
lower middle income			6.8*** (1.64)
N obs.	91	85	189
R^2	.16	.09	.31

Note *** - significant at 1 per cent level. Dependent variable: tax ratio as defined in Table I. Right-hand side variables: columns (i) and (ii) - log GDP/capita, USD; column (iii) - dummies for countries' income groups as classified by the World Bank. Estimation method: OLS. Standard errors are heteroscedasticity-robust.

Table VI: Tax ratio and log GDP per capita - testing for sample selection

Variable	(i)	(ii)	(iii)
log GDP/capita	4.12*** (.13)	4.14*** (.16)	4.06*** (.5)
lead s_{it}	.89 (1.01)		
N non-missing obs.		.00 (.06)	
N obs.	1838	1838	136
R^2	.37	.37	.33

Note *** - significant at 1 per cent level. Dependent variable: in all columns tax ratio as defined in Table I. Sample used: columns (i) and (ii) - all observations; column (iii) - 2008, excluding countries which did not report tax revenue in 2006. Right-hand side variables: log GDP/capita, USD; s_{it} - selection indicator, 1 if r_{it} is non-missing, 0 if r_{it} is missing, where r_{it} is tax ratio for a country i in a year or group of years t . Estimation method: OLS. Standard errors are heteroscedasticity-robust.

Table VII: Tax ratio by country and region – regressions (1990-2008)

Variable	(i)	(ii)	(iii)	(iv)
Average tax ratio in a country's region	.97*** (.02)	.33*** (.04)	.78*** (.11)	
log GDP / capita	.43*** (.08)	3.06*** (.24)	1.85*** (.49)	2.36*** (.49)
South Asia, East Asia and Pacific				-1.08 (2.07)
Europe, Central Asia, and North America				9.48*** (1.95)
Middle East and North Africa				-2.07 (2.57)
Sub-Saharan Africa				.07 (2.17)
N obs.	2587	2587	176	176
R^2	.47	.23	.44	.43

Note *** - significant at 1 per cent level. Dependent variable: tax ratio as defined in Table I. Estimation method: Column(I) - pooled OLS, 1990-2008; Column (II) - country fixed effects, 1990-2008; Column (III) - OLS, average 2007-2008; Column (IV) – OLS, average 2007–2008 with regional dummies (Latin America & Caribbean as numéraire. Standard errors are heteroscedasticity robust.

Table VIII: Low tax performers vs. rest of the world: regressions

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
dep. variable	rev	exp	debt flow	grants	pol	dur
GDP/capita	0.290*** (0.110)	0.252*** (0.0908)	0.257* (0.090)	-0.327*** (0.068)	0.160*** (0.039)	2.294*** (0.342)
1 if low tax perf.	-7.215** (3.733)	-8.182*** (2.318)	0.101 (0.581)	-2.054 (2.306)	-3.062** (1.2239)	-0.227 (3.49)
N obs.	158	159	120	163	147	148
R2	0.099	0.125	0.032	0.064	0.138	0.537
	(vii)	(viii)	(ix)	(x)	(xi)	(xii)
dep. variable	v&a	gov eff	pop	gdp	deaths	displ pop
GDP/capita	0.039*** (0.0042)	0.0569*** (0.00734)	-0.410 (0.546)	24.49* (14.20)	-1.34e-05 (1.11e-05)	- (0.00370)
1 if low tax perf.	-0.685*** (0.135)	-0.500*** (0.130)	27.95 (30.45)	-208.5* (115.6)	0.00127 (0.000981)	0.343 (0.242)
N obs.	171	171	173	173	172	176
R2	0.373	0.609	0.009	0.104	0.032	0.038

Note * – significant at 10 per cent level, ** – significant at 5 per cent level, *** – significant at 1 per cent level. Years analyzed in all regressions – 2007–08. *rev*, *exp* – total government revenue and expenditure, per cent GDP (source – WDI); *debt flow* – public and publicly guaranteed external borrowing, per cent GDP (source – WDI); *grants* – ODA (Official Development Assistance) grants & other grants to government (GG), per cent GDP (sources – OECD, IMF’s GFS); *pol* – Polity 2 index of democracy (source – Polity IV project); *dur* – durability of regime, years (source – Polity IV project); *v&a* – voice and accountability index (source – WGI); *gov eff* – government effectiveness index (source – WGI); *pop* – population, mln (source – WDI); *gdp* – GDP, bln constant US 2000 dollars (source – WDI); *deaths* – deaths in battle, thousands per cent pop. (source – WDI); *displ pop* – intentionally displaced population, per cent pop. (source – WDI). All figures are averages of 2007–2008. Right hand side variables – GDP/capita, thousands USD and dummy equal to 1 if a country is low tax performer (see Table 2 for the list). Estimation method in all regressions: OLS. Standard errors are heteroscedasticity robust.

Table IX: Low tax performers: Governance, size, special circumstances

Country	Governance				Size		Special circumstances	
	pol	dur	v&a	gov eff	pop	gdp	deaths	displ pop
Bahamas, The			1.1	1.1	0.34	6.09		
Bahrain	-7	33	-.8	.4	0.77	12.8		
Bangladesh	-6	1	-.6	-.8	159	71.75		
Bermuda			1.0	1.0	0.06	4.65		
Bhutan	-2	1	-.9	.2	0.68	0.8		
Cambodia	2	10	-.9	-.8	14.44	7.21		
Centr. Afr. Rep.	-1	5	-1.0	-1.4	4.3	1		4.58
Chad	-2	16	-1.4	-1.5	10.77	3.03	8.18	1.61
Colombia	7	51	-.3	.1	44.69	132.5	5.68	6.71
Comoros	9	2	-.5	-1.8	0.64	0.24		
Congo, Rep.	-4	11	-1.2	-1.4	3.58	4.23		
Dominican Rep.	8	12	.2	-.4	9.88	35.2		
Equatorial Guinea	-5	39	-1.9	-1.4	0.65	5.44		
Gabon	-4	17	-.9	-.7	1.44	5.97		
Guatemala	8	12	-.2	-.5	13.52	25.6		
Haiti	5	2	-.7	-1.3	9.8	3.8		
Hong Kong, China			.5	1.8				
India	9	58	.4	.0	1135	794.5	.19	
Indonesia	8	9	-.1	-.3	226	240		
Iran	-6	4	-1.5	-.8	71.49	152	.13	
Kuwait	-7	44	-.5	.2	2.7	61.4		
Lao PDR	-7	33	-1.7	-.9	6.15	2.85		
Lebanon	7	3	-.4	-.6	4.18	23.45		1.68
Libya	-7	57	-1.9	-.9	6.23	47.5		
Liechtenstein			1.3	1.8	0.04	2.75		
Malaysia	5	18	-.6	1.1	26.79	136		
Micronesia, FS			1.0	-.6	0.11	0.23		
Nepal	6	2	-.8	-.8	28.55	7.12		.18
Nigeria	4	9	-.6	-1.0	149.5	72.1		
Pakistan	4		-1.0	-.7	164.5	107	3.15	.09
Palau					0.02	0.13		
Panama	9	19	.6	.2	3.37	18.2		
Paraguay	8	15	-.3	-.8	6.18	9.2		
Philippines	8	21	-.2	.0	89.53	109		
Singapore	-2	43	-.4	2.5	4.71	135		
Sri Lanka	6	60	-.4	-.3	20.08	23.5	38.56	2.40
Sudan	-4	3	-1.7	-1.3	40.89	21.15	1.48	3.00
Syria	-7	45	-1.8	-.7	20.33	26.7		
Timor-Leste	7	6	.1	-1.1	1.08	0.34		3.66
Venezuela	5	40	-.6	-.9	27.71	163		
Yemen	-2	15	-1.1	-1.0	22.59	12.65		.39

Note Columns: pol – POLITY2 index of democracy (source – Polity IV project); dur – durability of regime, years (source – Polity IV project); v&a – Voice and Accountability Index (source – WGI); gov eff – Government Effectiveness Index (source – WGI); pop – population in millions (source – WDI); gdp – GDP, billions of constant US 2000 dollars (source – WDI); deaths – battle-related deaths, thousands per cent pop. (source – WDI); displ pop – internally displaced persons, per cent pop. (source – WDI). All figures are averages of 2007–2008.

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