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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 cat-egory. 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, H60, H27, H28
Keywords *Tax system; tax ratio; governance; developing countries*

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1. Introduction

Countries with a low tax yield or lax enforcement of tax laws are running out of time. Such 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. Most developing countries are the subject of at least some country-specific information on tax systems and revenues.

However, much of the available in-depth information is not truly comparative,[1] and much of the comparative information is not truly in-depth. As a result, governments and donors usually approach the issue of tax reform in developing countries on a strict 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 by comparing it to certain absolute threshold values, regional averages or OECD tax ratios. None of these procedures, however, appears to be convincing, as they do not take any account at all of the conditions and development levels of individual countries.

The present paper combines quantitative and qualitative approaches to the comparative analysis of tax systems. As a first step it argues that 'tax performance' should not be assessed against some absolute values (such as the average OECD tax ratio) or theoretical tax yields. Rather, it should be approached as a function of tax ratio and development level (proxied as logged GDP per capita). The relation between both variables is well-established 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, additional variables such as regional patterns, non-tax revenue and governance levels are introduced and discussed within a qualitative analytical framework, and with a specific focus on the group of 'low' tax performers.

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

[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.

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, rises 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.[2] Rather, we suspect that a number of underlying causalities operate in this relation, 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 certain absolute values – a reference we find astonishingly often in development policy literature (see for instance UNDP 2010). Linking tax revenue to development levels leads also to more realistic expectations concerning changes in tax revenue. Drastic alterations from 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. By means of an OLS regression it establishes a trend line (fitted values) and determines the distance of each country from this line. 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 2007/08 as the most recent observation period, we cover the years before the outbreak of the world economic crisis, with its rather distorting impacts on the public finances of many developing and developed countries. We are also able to gather data for a large group of countries.[3]

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 2007/08). 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.

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 condi-

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[2] Cheibub (1998) as well as Pessino and Fenochietto (2010) present evidence on the significance of GDP per capita even accounting for other 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).

[3] 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.

tions, 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).

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 reginal dummies they find that "in some cases the relationship between the tax structure and political variables appears to be region-specific" (ibid., 4). Other authors (for instance Jiménez et al. 2010; di John 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.[4]

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. Besides this, tax performance may be shaped by specific conditions, such as natural disasters or violent conflicts (Everest-Phillips 2010).

The data challenge

Gathering data on actual tax revenue collection in developing countries is still quite 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). This may lead to effective tax rates and the tax ratio being overstated (Aizenman and Jinjarak 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. As a result, many research papers that consider developing countries use CG data (see, for example, Teera and Hudson 2004; Gambaro et al. 2007).

For our purposes, however, this would not be appropriate, since we want to take account of all government revenues in as many countries as possible. Subnational levels 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 favor' of the lower-income countries in our sample.[5]

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 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

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[4] This is in line with findings from other studies. See for instance Cheibub (1998: 365); Garcia and von Haldenwang (2011).

[5] 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.

budget to the public pension system each year. Omitting these revenues from our calculations would therefore not be justified.[6]

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 side by side, or where social contributions were treated incoherently.

Consequently, there are 189 countries in our sample for the construction of the trend line (see Table 1). 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.

Table 1: Tax ratio and log GDP per capita - descriptive statistics

Name	Data source	N obs.	Mean	St. dev.	Min	Max
Tax revenue	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, GG	71	31.11	11.57	0.9	71.2
"	CEPAL, CG	20	17.07	4.5	9.85	26.46
"	IMF GFS, CG	102	24.22	10.65	0.9	70.29
"	ASDB	40	18.51	3.95	8.3	22.72
"	ColTax	189	20.09	9.13	0.9	51.73
Tax revenue, no soc. contr.	All above	189	20.27	8.75	2.69	60.44
Tax revenue, 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 revenue is 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 revenue, 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.

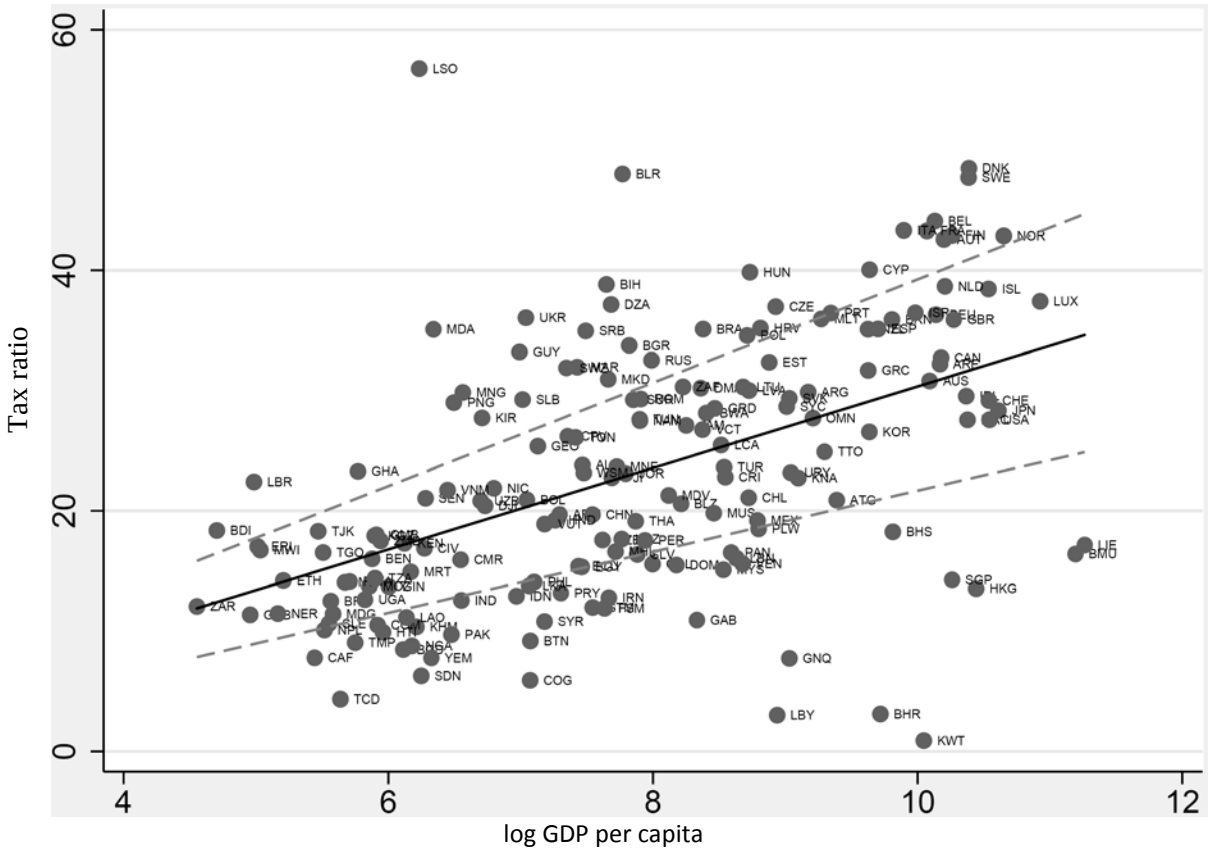
[6] To check for sample bias, we also consider tax revenue without social contributions. We find that the slope of the trend line changes, but there are few changes with regard to the low tax performers' group. See section 3 for more details.

3. Results of the analysis

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 2 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 1. 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 2: Tax ratio and log GDP per capita – regressions

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

Note *** - significant at 1 per cent level. Dependent variable: tax ratio as defined in Table 1. Right-hand side variable: column (I) - log GDP/capita, constant 2000 USD; column (II) - log GDP/capita, constant 2005 PPP – see definitions in Table 1. 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 3 is a list of all countries with their respective distance from the trend line.

Table 3: 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 & Herzeg.	16.41	Georgia	4.73	Mali	-1.61	Timor-Leste	-6.89
Sweden	15.93	United Kingdom	4.50	Rwanda	-1.66	Central African Rep.	-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
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 2, 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*,[7] countries with a tax ratio above the 95 per cent confidence

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

interval (ii) *high tax performers* and those with a tax ratio below the 95 per cent confidence interval (iii) *low tax performers*.[8]

Robustness checks and specifications

We performed several robustness checks and looked for alternative specifications of our main variables, GDP per capita and tax revenues.[9]

Sensitivity to outliers: As Figure 1 and Table 3 show, Lesotho is an exceptional tax performer, yet with a relatively low level of development. It derives 50 per cent of its tax revenues from the Southern Africa Customs Union, which may not be directly related to Lesotho's own tax effort. Nonetheless, an outlier of this kind may skew the results of the whole regression. Similarly, the oil states Kuwait, Bahrain and Libya are clearly outliers in terms of low tax collection. We therefore repeated the analysis without Lesotho and the other three countries. In both cases there are minor differences in the resulting lists, with four countries changing categories in the first exercise and seven countries in the second.

Alternative functional forms: In our main specification we take the logarithm of GDP per capita as a proxy for a country's development. Alternatively, level data and / or GDP per capita squared can be used.[10] All coefficients remain highly significant, even though the data explain less variation in tax revenue (R^2 is higher when log GDP per capita is used). This results in much broader lists of low and high tax performing countries. Yet the 'leaders' of the lists do not change compared to our main specification.

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 taking social contributions into account, while (ii) a second option would be to adjust for local tax revenue in those countries which 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.[11] But is the difference between CG and GG relevant to them?

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8 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.

9 The results of these operations are presented in Table I in the Appendix.

10 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.

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

- Data from Ivanyna and Shah (2011) reveal that, in 2005, the average subnational government (SNG) expenditures of the countries that report GG data was 23.7 per cent of total expenditures (which are comparable to total revenue). For countries that report only 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 (2011) 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.
- 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 (2011), local government in an average 'CG only' country would collect 9.7 per cent * 0.57 = 5.5 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 per cent * 0.055 = 0.9 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 in poorer countries from that in richer countries (Tanzi 1992; Burgess and Stern 1993; Piancastelli 2001; Teera and Hudson 2004; Clist and Morrissey 2011). To address this question[12] 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 to regress 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 GDP per capita as a proxy for economic development (since it also assumes non-linearity between income and tax ratio of roughly the same kind).

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.

[12] The results can be found in Table II in the Appendix.

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 the samples of the previous observation periods were qualitatively different from 2007-08, a country's change in position vis-à-vis the trend line could be due to sample selection rather than its own development.

However, the fact that the 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 directly (since the relevant data are the data that are missing), but there are indirect checks.[13] For instance, we checked for such variables as 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 which 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 III). None of the tests produced results significantly different from our original argument, which means that there is no evidence of sample selection.

Table 4: 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

Table 4 summarizes the changes of category for each period compared to 2007-08. As can be seen, a total of 53 countries changed categories between 1997-99 and 2007-08. Of these, 32 registered a downward trend, with 21 moving from average to low and 11 from high to average tax performance.

[13] See Table III in the Appendix for the results.

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. 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 are exceptions).

In contrast, Africa shows some mixed results, with countries such as Burundi, Liberia, Morocco and Algeria being among the high tax performers, while countries such as Chad, Sudan, the Central African Republic and Nigeria count as low tax performers. Finally, average-high and high tax performance predominate 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.

Are those findings suggesting regional patterns of tax performance corroborated by statistical analysis? On a global scale, they are. Table 5 presents the result 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 becomes weaker but remains strongly significant if we include country fixed effects in the panel.

Table 5: Tax ratio by country and region – regressions (1990-2008)

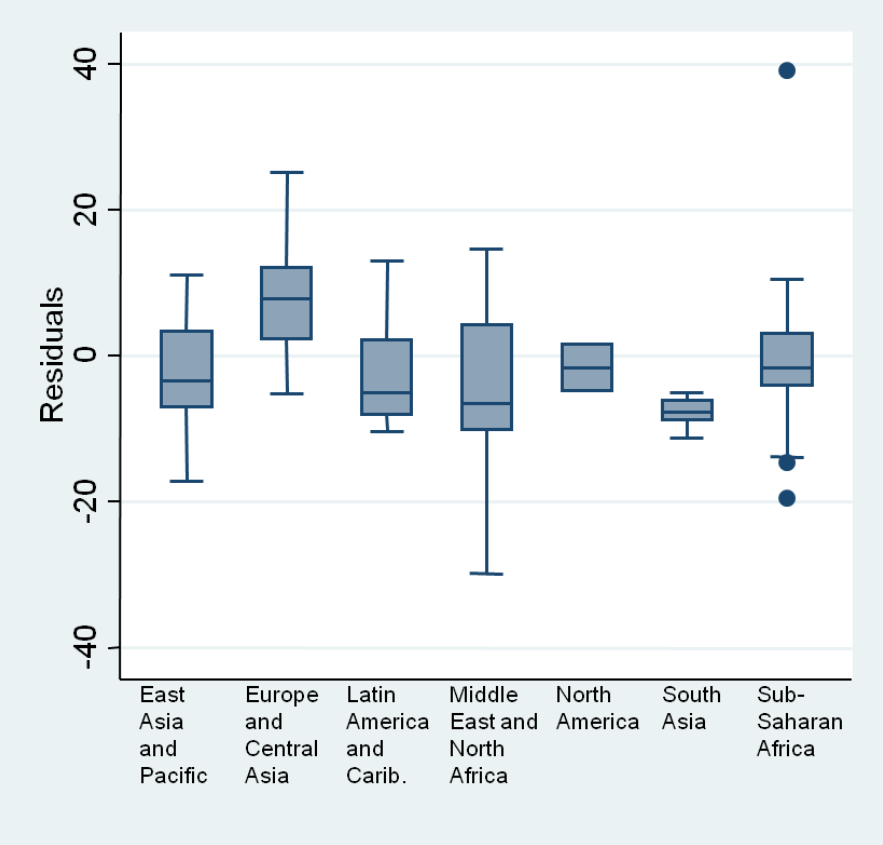
Variable	(I)	(II)
Average tax ratio in a country's region	.97***	.33***
	(.02)	(.04)
log GDP / capita	.43***	3.06***
	(.08)	(.24)
N obs.	2587	2587
R^2	.47	.23

Note *** - significant at 1 per cent level. Dependent variable: tax ratio as defined in Table 1. Estimation method: Column(I) - pooled OLS; Column (II) - country fixed effects. Standard errors are heteroscedasticity robust.

Even though the regional setting appears to be a relevant factor for the tax performance of individual countries, we can not be sure 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 individu-

al 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 middle 50% 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 upper vs. lower 25% of each sample. As can be seen, Europe and Central Asia is the only region with more than 75% of all countries above the trend line. However, all the other regions present overlapping values, the only exception being South Asia which, as a region, is clearly 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 presents an interesting picture, with countries above the regional mean being quite heterogenous and countries below the mean showing a high degree of uniformity.

Figure 2: Distance from the trend line: regional averages



Note Based on the estimate (I) from Table 2, distance in per cent tax revenue/GDP, average of 2007-08. The graph only includes countries with a population size above 500.000.

Some regional patterns in changes over time are also worth mentioning. For instance, among those who improved their performance are two transformation countries in Eastern Europe and Central Asia: Kazakhstan and Russia. On the 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, which changed from low to average performance. Similarly, nine sub-Saharan African countries moved to lower categories (e.g. Chad, the Central African Republic, Nigeria, Malawi and Namibia), while Liberia alone changed 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.[14] 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 the 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.

Alternative sources of revenue

As pointed out in Section 2, governments finance some of their expenditures from sources of revenue other than taxation. Major alternative sources are property income, which also includes dividends and withdrawal of profits from state enterprises, and grants from foreign governments and international organizations. ODA grants include direct transfers to governments, transfers to other stakeholders and the writing-off of debts. 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 with 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 sources of revenue 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), but 16 countries achieved 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 receive a great deal of foreign aid. 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. 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. Of the ten high non-tax revenue, low-ODA countries, 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 with regard to non-tax revenue. But only in the cases of Lebanon and Gabon can it be said that loans were a real alternative to tax revenue in 2007-08.

Governance levels

The size of the public sector and the quality and quantity of public services may be the outcome of choice by a society. If a country is governed in a democratic and transparent manner and if the government implements public policies effectively, there is no question of revenue mobilization problems, even if the country has a low tax ratio. Yet we suspect that the standing of a majority of the low

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

tax performers, especially those from the lower-middle-income and low-income groups, in tax matters coincides with below-average governance ratings.

We consider several governance indicator sets in order 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.[15]

- According to the **Polity IV democracy index**, 13 of 35 countries qualify as 'democracies'[16] 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" categories, 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.[17] Only nine countries achieve a higher-than-average rating (above zero), and five of them are small high-income countries[18] 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 another eleven 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 tax or 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 the narrowest of margins). They include several small high-income countries mentioned above as well as some rather non-democratic or 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

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15 The ratings are presented in Table IV (Appendix).

16 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).

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

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

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 high governance rankings, 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. 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.

A look at 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 check to see if 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).[19] From these indicators it appears that special circumstances may have a major influence on tax performance in several countries, including Sri Lanka, Chad, the Central African Republic, Pakistan, Sudan, Timor Leste and Colombia.

4. Conclusion

The findings presented above enable three relatively distinct groups of low tax performing countries to be identified:

- a first group consisting of nine states with high non-tax revenue and low ODA grants: Libya, Kuwait, Equatorial Guinea, Bahrain, Gabon, Nigeria, Iran, Venezuela and Colombia;
- a second group composed of six countries with comparatively high levels of governance and small government: the Bahamas, India, Bermuda, Liechtenstein, Panama and Hong Kong. Three other countries with medium levels of governance and small government can also be ascribed to this group. They are the Dominican Republic, Malaysia and Singapore;

[19] 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 million 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 million), along with a significant number of displaced persons (6.7 per cent of the population).

- a third group comprising 22 countries with generally 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.

The reasons for the first group's low tax performance are relatively clear: their high non-tax revenues provides them with no real incentive to engage in tax collection. 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 the 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 were taken into account.

Regarding the third group, reasons for low tax performance are less apparent and probably more diverse. A lack of capacity (ineffective tax administration) or tax effort (for instance, resistance to tax policy reform, high levels of "permitted" tax evasion) are possible explanations, at least for those countries which have 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 could be one reason for low tax performance.

It should be noted that 16 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. This lends additional weight to those initiatives which raise the issue of domestic revenue mobilization on a multilateral level.

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 last 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 got stuck in its elitist and autocratic past (Jiménez et al. 2010).

In Eastern Europe the story is again 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

of 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 clear relationship between tax revenue and level of development. Most countries in this regions 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. Even today, however, research on tax performance can find support in a number of general indicators or approaches. Recent initiatives to broaden the PEFA on tax matters, to gather data on developing countries' tax efforts (see OECD/AfDB/ECA 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 – alternative specifications

	(i)	(ii)	(iii)	(iv)	(v)	(vi)
log GDP/capita	3.56***	3.73***			2.03***	3.28***
	(.43)	(.42)			(.36)	(.45)
GDP/capita			.29***	.93***		
			(.1)	(.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, DOM, LBN, LKA, BHS, PLW	COL, IND, PHL
in, low tax perf.	SLV	MEX, ATG, MHL, SLV, EGY, ECU	45 countries	43 countries	CRI, MDG, GRC, SLE, SLV, ECU	none
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 1; column (v) - tax rev. excluding social contributions; column (vi) - tax ratio, adjusted, see Table 1 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 II: Tax ratio and log GDP per capita – poor vs. rich countries

Variable	(i)	(ii)	(iii)
log GDP/capita	4.38***	3.43***	
	(.93)	(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 1. 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 III: Tax ratio and log GDP per capita - testing for sample selection

Variable	(i)	(ii)	(iii)
log GDP/capita	4.12***	4.14***	4.06***
	(.13)	(.16)	(.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 1. 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 IV: Low tax performers: Governance, size, special circumstances

	Governance				Size		Special circumstances	
Country	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.