Domestic revenue mobilization: estimating the gaps between ability and effort

POLICY BRIEF   **APRIL 2019**

EXECUTIVE SUMMARY

Achieving the Sustainable Development Goals (SDGs) will require significant increases in financial resources from many different sources especially **domestic revenue mobilization (DRM)**. This policy brief summarizes a new study "**Enhancing domestic revenues: constraint and opportunities - a cross country comparative study of tax capacity, effort and gaps**" that addressed three key questions about DRM:

- How much domestic revenues should a country be reasonably mobilizing—that is, what is its tax capacity?

- What are the reasons a government is not raising the tax and non-tax revenues it needs—that is, what are the main reasons for the gap between capacity and performance?

- What are the implications for governments and for donors—that is, how should aid relationships change as developing countries approach income transitions?

The study found that there is currently considerable variation in **DRM between and within low-income countries (LICs), lower middle-income countries (LMICs), upper middle-income countries (UMICs), and high-income countries (HICs).** The share of domestic revenues (taxes, user fees, and mandatory contributions) is 15% of gross domestic product (GDP) in LICs, 25% in LMICs, 30% in UMICs, and 40% in HICs. The largest increment of domestic revenue is noticed when a country moves from the LIC to the LMIC category.

In terms of **determinants of revenue performance among LICs and LMICs, economic structure matters the most for revenue performance** — especially the size of the informal sector (as indicated by the share of agriculture in the economy) and the existence of effective tax handles (such as the share of imported goods in GDP). For LMICs and UMICs, foreign assistance has a negative impact on revenue performance and reduces tax performance by about 40% to 60% of the amount of external grants received. In general, GDP per capita, goods imports as a share of GDP, and the domestic tax rate indicator have positive impacts on tax capacity while the share of agricultural value added has a negative impact.

The study calculates **tax effort across income groups**. While tax and revenue efforts of UMICs have increased over the last two decades, the performance of LICs and LMICs appears to be declining. The study highlights that although tax expenditures are an important determinant of the tax and revenue capacities of a country, they are the least transparent forms of government spending and are not properly measured and recorded for most countries. **Improved tax expenditure reporting and analysis, and elimination of cost ineffective tax expenditures should be an integral part of a country's DRM enhancement strategy.**

Countries experience a progressive reduction in donor financing when they move from LIC to LMIC and then to UMIC. **Donors should work closely with countries and provide adequate support to facilitate DRM before and during graduation from aid.** Capacity building for better tax administration, improved tax expenditure reporting, strengthening institutions, and advancing economic growth would be key to ensure continued revenue performance improvements when countries reach middle-income status.

INTRODUCTION

As countries develop, their economic structures change. As their incomes grow, the importance of government—as measured, for example, in the share of taxes and spending in aggregate economic activity—increases. Over the period 2000 – 2015, the world economy underwent major income transformations (Figure 1). The number of countries in the LIC category halved from 63 to 31 resulting in a major concentration of the world population in the MIC category. This upward mobility from the LIC to the LMIC category included the two large population economies of India and Indonesia. Several countries, such as China and a number of Latin American nations, moved up into the UMIC category (see tables 1 and 2).

Figure 1: Distribution of population across income groups, 2000 vs 2015
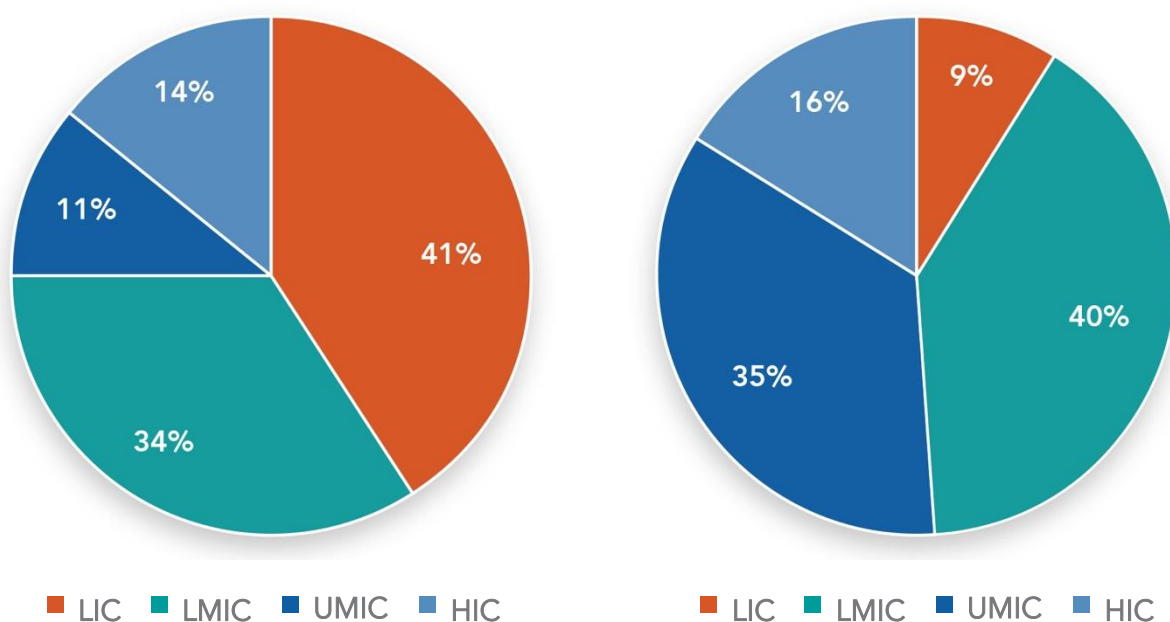
Source: World Bank World Development Indicators

One of the main economic changes in the process of these transformations is an increase in the share of economic activities that are formally transacted using money. This share rises as countries experience a decline in unpaid family work on small farms and in informal enterprises and a rise in paid, formal employment. Relatedly, as countries develop, the size of government increases. One reason for this increase is that as the economy becomes more monetized, more activities can be taxed. Governments can raise more revenues and can spend more. The need for countries to effectively deliver a wide range of public services was explicitly emphasized in the Millennium Development Goals (MDGs)[1] of 2000-15 and more recently the SDGs of 2015-2030[2]. This government funding of public services is essential to underpin economic growth, and social and development goals, particularly for developing and emerging

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[1] The MDGs were the eight international development goals for the target year 2015, established after the adoption of the United Nations (UN) Millennium Declaration at the UN Millennium Summit in 2000. All 191 UN member states at that time, and at least 22 international organizations, committed to help achieve the MDGs by 2015.

[2] The SDGs, officially known as Transforming Our World: the 2030 Agenda for Sustainable Development, is a set of 17 global goals with 169 targets. The UN led a deliberative process involving its 193 Member States, as well as global civil society. The goals are contained in paragraph 54 of UN Resolution A/RES/70/1 of 25 September 2015. The resolution is a broader intergovernmental agreement that acts as the post-2015 development agenda (the successor to the MDGs).

economies. The Addis Ababa Financing for Development conference in mid-2015 highlighted that the SDGs would require significant increases in financial resources of all types, with a special emphasis on DRM.[3]

One operational question then is to understand revenue performance across the world, particularly among LICs and LMICs and determine what a reasonable tax to gross domestic product (GDP) ratio might be for any given developing economy. Estimating this ratio is not a simple exercise, but it is necessary to help countries determine whether they are performing at an optimal level and allows them to explore opportunities to enhance DRM. This exercise also informs donors how best to (a) provide adequate support in the early stages of development and (b) institute the correct incentives that ensure continued progress when countries reach middle-income levels.

In a new study conducted by Professor Graham Glenday, Ipchita Bharali and Ziyuan Wang for Duke University's Center for Policy Impact in Global Health, the researchers examined this revenue performance. This policy brief provides a summary of the report's main findings.

Glenday, Bharali and Wang (2018) addressed three key questions:

1. How much domestic resources should a country be reasonably mobilizing—that is, **what is its tax capacity**?

2. What are the reasons a government is not raising the tax and non-tax revenues it needs—that is, **what are the main reasons for the gap between capacity and performance?**

3. What are the implications for governments and for donors—that is, **how should aid relationships change as developing countries approach income transitions**?

REVENUE PERFORMANCE

Typically, the share of domestic revenues (taxes, user fees, and mandatory contributions) is 15 percent of GDP in LICs, 25 percent in LMICs, 30 percent in UMICs, and 40 percent in high-income countries (HICs).[4] This share is shown in Figure 2. If we look at tax revenues alone, the share as a percentage of GDP is 12 percent in LICs, 18 percent in LMICs, 9 percent in UMICs and 25 percent in HICs (Figure 3). The trends in revenue performance shown in the figures highlight two key things:

i. The share of revenue over GDP increases as a country moves across income groups. **The most noticeable single increment is in taxes by 5.9 percent of GDP between the average LIC and LMIC categories.** Glenday et al. (2018) also show that **the increment of domestic revenue per \$1,000 increase in GDP per capita is the highest as a country moves from the LIC to LMIC category at 4.1 percent of GDP**, but drops to 0.9 percent of GDP per \$1,000 from LMIC to UMIC and further to 0.3 percent of GDP per \$1,000 from UMIC to HIC.

ii. There is **considerable variation in DRM within these four income categories as well as regional groups**. Among LICs, for example, while the typical tax to GDP ratio is 15 percent, it is not unusual for countries to collect as little as 7.5 percent of GDP in revenues and as much as 22.5 percent. Among LMICs, this ratio can range between 15 and 35 percent, and between 20 and 40 percent among UMICs. Among the regions, South Asia has the lowest revenue performance, while Sub Saharan Africa shows the highest amount of variation in both domestic revenue and tax collection.[5] Appendix 1 provides a more detailed overview of the revenue performance and composition by countries by income class and in sample periods before and after 2000.

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[3] See for example, John McArthur, "What happened at the Addis financing for development conference," Brookings, July 21, 2015 https://www.brookings.edu/blog/up-front/2015/07/21/what-happened-at-the-addis-financing-for-development-conference/.

[4] In July 2018, the World Bank classified countries with a gross national income per capita of \$995 or less as LIC, between \$996 and \$3,895 as LMIC, UMIC as between \$3,896 and \$12,055, and HIC with per capita incomes of \$12,056 or more. These numbers are valid until July 2019.

[5] Regional classification used in the study are detailed in Annex 1

Figure 2: Domestic revenue % of GDP
Mean & ± 1 Standard Deviation
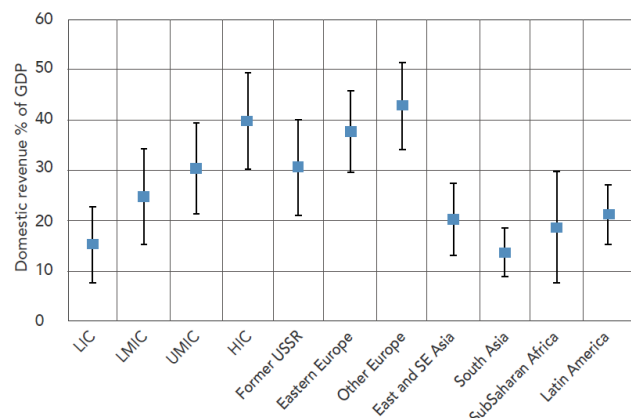
Figure 3: Tax % of GDP
Mean & ± 1 Standard Deviation
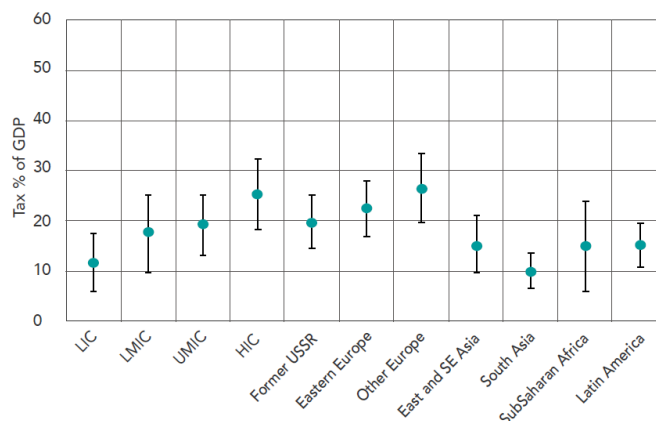
Source: Glenday et al. (2018). Original data from Government Revenue Database, International Center for Tax and Development

Clearly, a country's income is not all that matters for how much its government collects as taxes. If that were the case, then all that a government would do to increase tax revenues would be to foster economic growth. From figures 2 and 3, we know that governments can do a lot more. The question is how to determine whether they are doing all that they could. In the broadest sense, this is the question that this note tries to answer.

Governments can always spend more than they collect as revenues, at least for a while. Poorer countries can do this for longer because they generally get foreign aid. In LICs, the share of foreign aid to GDP is about 2.5 percent. In LMICs, this drops to about 0.8 percent; for UMICs, it is a negligible 0.2 percent. Developing country governments should expect aid to fall after the transition from LIC to MIC status, and end soon after.

For both givers and receivers of foreign assistance, one of the main concerns is that aid could reduce the pressure on governments to raise domestic revenues and hence potentially distort the natural process of economic development. The question is a central one for developing countries transiting from low-income to higher levels of income. It is understandable that donors expect governments in these countries to make a serious effort to rely more on domestic revenues and less on foreign aid.

Developing countries that have depended on foreign aid may not build the revenue administration capacity and make the tax policy choices that are needed to ensure adequate financing when they transition to higher income categories. But how can a donor decide whether the government in a country experiencing economic growth is also making an honest effort to reduce its dependence on outside help? The stakes can be high. It is reasonable to worry that a sharp withdrawal of foreign assistance might lead to a serious setback. But the real danger is that even a pre-announced and gradual reduction of foreign aid jeopardizes hard-won gains in health, education, and public security, because governments cannot muster domestic funds for what donors were supporting. Economies can stagnate and even regress.[6]

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[6] Last year, for example, Tajikistan's economy slid backwards from lower middle-income to low-income. The other two countries that slid back into low income were Syria and Yemen.

Table 1: Significant income transitions since the mid-1970s

TRANSFORMATION	COUNTRY	CHANGE IN GDP PC (1975-2015) IN CONSTANT 2010 US$	TRANSITION YEAR	
			2000 or BEFORE	AFTER 2000
LIC to UMIC				
	China	6,243	1997	2010
LIC to LMIC				
	India	1,396		2007
	Indonesia	2,907		2003
	Sri Lanka	2,887	1997	
LMIC to HIC				
	Chile	10,365	1993	2012
LMIC to UMIC				
	Botswana	5,842	1991	
	Brazil	4,643	1990	
	Bulgaria (1985-2015)	4,388		2006
	Colombia	4,210		2008
	Costa Rica	4,838	2000	
	Dominican Republic	4,402		2008
	Ecuador	2,225		2010
	Malaysia	8,372	1992	
	Thailand	4,729		2010
	Turkey	6,963	1997	
UMIC to HIC				
	Hong Kong SAR, China	29,020	1983	
	Korea, Rep.	22,332		2001
	Malta	19,660	1998	
	Oman	7,551		2007
	Portugal	9,582	1994	
	Trinidad and Tobago	8,989		2006
	Uruguay	8,214		2012

Source: Glenday et al. (2018).
Abbreviations: PC – per capita; **SAR** – Special Administrative Region; **DPR** – Democratic People's Republic

Table 2: The number of LICs has been cut in half since 2000

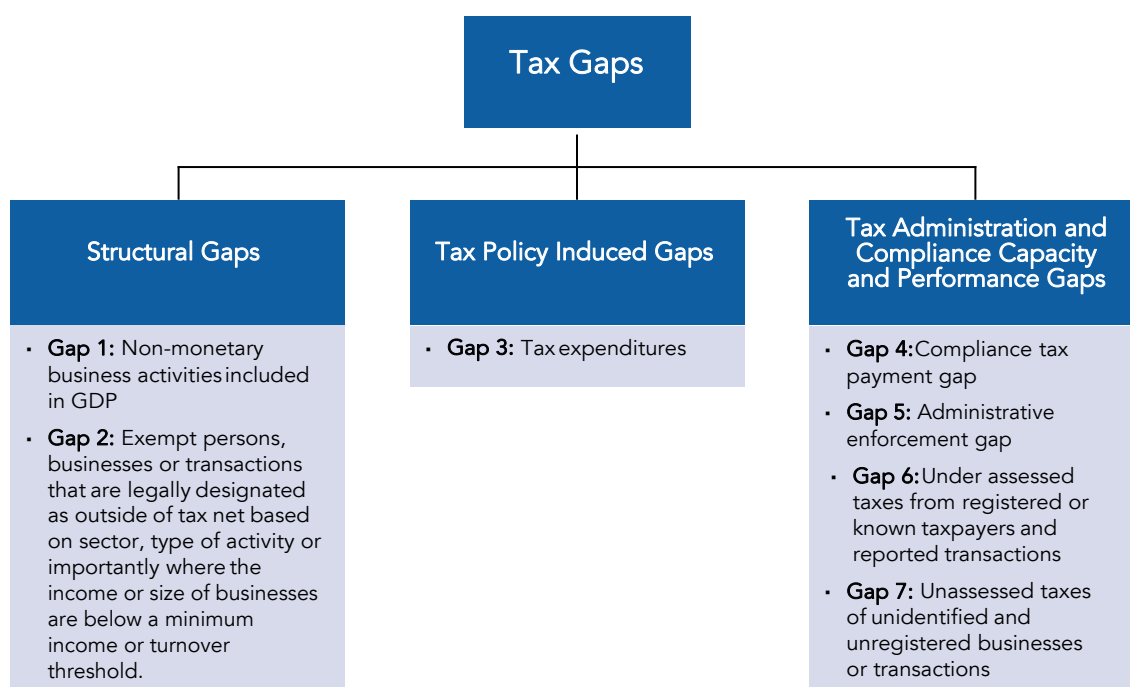| YEAR	INCOME CATEGORY	POPULATION (MILLIONS)	DISTRIBUTION	NUMBER OF COUNTRIES[a]	GDP (CURRENT US$) (BILLION)	DISTRIBUTION	NUMBER OF COUNTRIES[b]
2000							
	LIC	2,492	41.0%	63	1,090	3.3%	59
	LMIC	2,050	33.7%	53	2,476	7.5%	52
	UMIC	655	10.8%	37	3,634	11.0%	36
	HIC	882	14.5%	51	25,936	78.3%	47
	Total for countries in WDI	6,078	99.3%	204	33,136	98.8%	194
	Total for all countries (World)	6,118	100.0%	217	33,543	100.0%	199
2015							
	LIC	642	8.7%	31	402	0.5%	29
	LMIC	2,970	40.4%	52	6,035	8.1%	50
	UMIC	2,560	34.8%	56	20,680	27.8%	54
	HIC	1,183	16.1%	79	47,410	63.6%	59
	Total for countries in WDI	7,355	100.0%	218	74,510	100.0%	192
	Total for all countries (World)	7,355	100.0%	218	74,510	100.0%	192

Source: Glenday et al. (2018).
Abbreviations: WDI – World Development Indicators

ESTIMATING A COUNTRY'S REVENUE CAPACITY

The size of government, most commonly approximated by the ratio of government expenditures to GDP, is generally a matter of societal choice. But this choice has implications for how much revenue a government must raise. Among the HICs of the Organization for Economic Cooperation and Development (OECD), for example, the tax to GDP ratio varied between 26 percent for South Korea to 46 percent for France in 2017; differences in Korean and French expectations of their states might explain much of the 20 percentage point difference in government size.[7] But for a developing economy, this choice may be constrained less by societal preferences and more by how much revenue its government can reasonably raise. A country's ability to raise revenue depends on three sets of factors:

- The **structural characteristics of an economy** that make for more or less cost-effective revenue raising efforts. An economy that trades more or is less agrarian tends to make it easier for the government to tax effectively, for example.

- The **administrative capacity of the government**, which determines the cost-effectiveness of efforts to raise domestic resources.

- The **policy choices** made by the country, such as the highest tax rate, and the range and size of economic activities that are exempted from taxation.

Figure 4: Classification of tax gaps

Tax Gaps

Structural Gaps
- **Gap 1:** Non-monetary business activities included in GDP
- **Gap 2:** Exempt persons, businesses or transactions that are legally designated as outside of tax net based on sector, type of activity or importantly where the income or size of businesses are below a minimum income or turnover threshold.

Tax Policy Induced Gaps
- **Gap 3:** Tax expenditures

Tax Administration and Compliance Capacity and Performance Gaps
- **Gap 4:** Compliance tax payment gap
- **Gap 5:** Administrative enforcement gap
- **Gap 6:** Under assessed taxes from registered or known taxpayers and reported transactions
- **Gap 7:** Unassessed taxes of unidentified and unregistered businesses or transactions

In principle, the tax capacity of an economy can be estimated by using measures of these three factors, which can then be juxtaposed with the actual revenue collection effort. The difference between what could be reasonably collected and what is actually brought in as revenues is an obvious measure of the **"revenue gap"**.

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[7] Revenue Statistics 2018 Tax revenue trends in the OECD

With a little extra effort, we can estimate how much of this gap is structural, i.e., due to the difference in economic characteristics of a country relative to its peers—say the structure of Ethiopia's economy relative to the median LIC. And it is possible to identify how much is because of lower-than-average administrative capacity of a country—say India—relative to its LMIC peers. We can also determine how much is attributable to tax policy differences between the country and its peer group, e.g., the difference in tax rates and tax expenditures between China and the average across UMICs.

The decomposition into characteristics, capacity, and choices can inform donor policies. While all three of these can be altered by government policy, we should expect economic characteristics to change over long periods, state capacity to be increased somewhat more quickly, and public policy choices to be alterable even quicker.

Structural gaps

In developing countries, many activities are carried out outside the market. These activities could be labor in subsistence agriculture, or home construction. Since the 1990s, these activities are included in measured GDP. As a result, GDP may seriously overestimate the taxable base. One of the more reliable proxies for the importance of such non-monetized transactions is the share of value of added in agriculture in GDP. To measure tax capacity better, it makes sense to adjust measured GDP using this ratio.

Even when a transaction is carried out in the market, it may be appropriate to consider it outside the realm of taxation. Activities carried out in microenterprises and small farms, often by less educated and poorer segments of the society, qualify as eligible for exemption from the theoretical tax base for both practical and redistributive reasons. To get a more reliable measure of tax capacity, some estimate of the share of the informal sector (in total employment, for example) is generally used.

Simply making adjustments for these two structural factors results in more realistic estimates of the taxable base. Comparing this adjusted figure with actual revenue collections provides what public financial management experts call the **"structural gap"** in DRM.

Administrative gaps

Resource mobilization can fall short of potential because of inadequate capacity or enforcement even when administrators have the capabilities. The reasons for administrative tax gaps are incomplete compliance, enforcement, and assessment.

Most tax systems rely on taxpayer self-assessment and timely payment of obligations. The difference between what taxpayers owe and what they have filed is the **compliance gap**. After the due date, tax administrators move to enforce the rules. The speed and effectiveness with which they do so determine the **enforcement gap**—the difference between what is owed plus any penalties for late payment, and what is actually paid. The third gap is related to **under-assessment**. Estimating underassessment gaps requires reliable audits of past returns. The fourth gap is **the non-assessment of tax.** This is the hardest to assess (and effectively reduce through administrative reforms) as it involves identifying unregistered, but legally taxable activities and taxpayers that are embedded in the poorly surveyed, but often large informal sectors of LICs and LMICs.

Policy gaps

The third reason for domestic resources falling short of potential is deliberate policy design. Marginal tax rates can be kept lower than optimal, user fees may not be charged even when the circumstances are right for such charges, and there could be deliberate exemption or under-taxation of some economic activities. The reasons for not taxing monetized market transactions—called tax expenditures—that could conveniently be taxed at low administrative costs can range from economic (e.g., encouraging saving by allowing taxes to be deferred) to social (e.g., encouraging home ownership by allowing interest payments to be deducted) to political (e.g.,

excluding agricultural income). Good practice involves treating tax expenditures the same as actual government spending —providing a clear justification for them, and measuring their magnitudes as accurately as possible. Table 3 summarizes this discussion.

Table 3: Measures of the gaps between revenue capacity and effort

GAP	EXAMPLE	REPRESENTATIVE INDICATOR
Structural Gaps		
1. Non-monetized business activities included in GDP	Subsistence farming, unpaid family work	Share of agriculture in total value added, share of formally paid employees in labor force
2. Persons, businesses or transactions exempted because of sector, size, or income	Individuals with less than minimum income; firms with less than minimum turnover	Share of informal sector in employment or a share of GDP
Administrative Gaps		
3. Compliance with tax payments	Deduction of taxes from pay at source	Accounting standards and per capita accounting professionals, adult education levels
4. Enforcement of taxes and user fees	Tax arrears and outstanding refunds as a share of tax assessments	Political risk indicators including control of corruption, law and order, and bureaucracy quality; tax administration expenditure as a share of tax assessments
5. Underassessment of taxes from registered businesses and reported transactions	Audits of tax firms	Political risk indicators including control of corruption, law and order, and bureaucracy quality; tax administration professionals as a share of registered taxpayers
6. Non-assessed taxes from unregistered businesses or transactions	Unidentified and unregistered self-employed businesses	Urban informal sector as a share of GDP
Policy Gaps		
7. Activities exempted from taxation because of economic, social, or political reasons	Mortgage interest deduction	Tax expenditures as a share of GDP
8. Lower than optimal tax rates or absence of justified user fees	Unjustifiably low VAT rates on consumption items, nontransparent tax holidays or other tax incentives for large companies	Personal income tax rates, corporate income tax rates, VAT rates relative to comparable countries by region and income groups, aggregate user fees as share of total revenues

Source: Adapted from Glenday et al. (2018).
Abbreviations: VAT – value added tax

IDENTIFYING TAX AND REVENUE UNDERPERFORMANCE

The next step is to obtain the information on each country's characteristics, capacities and choices for all countries — low, middle, and high income—and identify each economy's revenue capacity. This capacity can then be contrasted with revenue outcomes to identify the revenue gap. The data to calculate these gaps are not always readily available, especially for developing economies, and generally have to be patched together from multiple sources. Often, less than ideal substitutes have to be used. This problem is especially acute for administrative capacity and policy choices. But, if carefully done, the estimates provide information that can be used to inform the dialogue between donors and recipients, especially in countries that are near or in the middle of an income transition.

At first glance, the aggregate statistics are reassuring. There is a sizeable step-up in both tax and non-tax revenues as countries develop from low to middle-income levels, and continued increases during middle-income development. Perhaps the only disconcerting finding is that **improvements in tax performance seem to slow down after countries reach lower-middle income levels**. This falloff in revenue performance happens only after 2000 (Table 4). But the finding may simply reflect changes in the subset of economies in the lower-middle income category rather than anything intrinsic about this stage of development.

Table 4: Revenue increments over time

INCOME GROUP	BEFORE 1990	1990s	2000s	2010s
Low income	13.7	14.5	16.0	16.0
Lower-middle income	24.1	24.5	25.7	22.9
Upper-middle income	25.5	29.5	31.0	31.1
High income	41.6	40.6	39.2	39.3

Source: Glenday et al. (2018)

Glenday et al. (2018) outline the methodology for calculating approximate estimators of both tax and revenue capacity, discuss the indicators used and carefully catalog the data sources. It is worth emphasizing that the difference between taxes and revenues can be sizeable, especially for resource-rich economies (Figures 5 and 6). The experience of developing countries shows that natural wealth can be hard to manage, creating not just tax gaps, but also large revenue gaps. Glenday et al. (2018) looks at two set of such countries. A set of eight countries (the Gulf States, Brunei and Libya) are noted as "oil revenue dominated" countries with high per capita income and very high domestic revenues to GDP ratio (43.5 percent on average). 88 percent of this revenue is from non-tax revenues, mainly from state-owned oil companies. These countries have no social security revenues and only average 5.4 percent tax to GDP ratios. The other set of countries are noted as "resource dependent economies" which comprise of 50 mostly MICs. These countries have a combination of high export shares of fuels and minerals or high shares of mining valued in their economies and a higher share of their domestic revenues (27% on average) come from non- tax revenues. As seen from figures 5 and 6 below, despite being resource rich, these countries are revenue poor. The culprits are usually the government's administrative capacity or tax policy choices.

Figure 5: Domestic revenue % of GDP
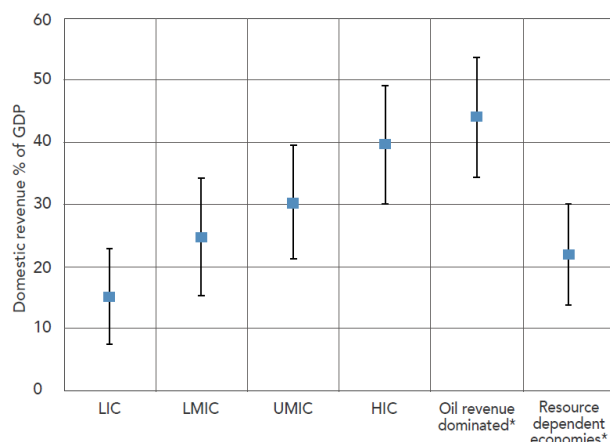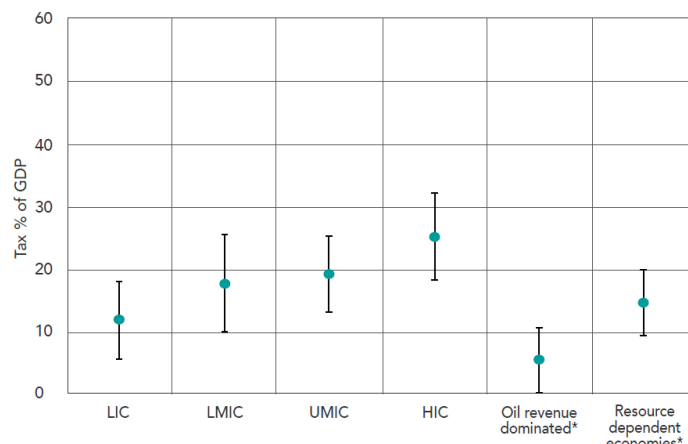Mean & ± 1 Standard Deviation

Figure 6: Tax % of GDP
Mean & ± 1 Standard Deviation

Source: Glenday et al. (2018). Original data from Government Revenue Database, International Center for Tax and Development

Determinants of tax and revenue performance

In order to understand which factors influence revenue performance the most, Glenday et al. (2018) adopt a two-part methodology. The first part of the methodology focuses on analyzing the trends and average values of the factors that are hypothesized to influence the amount of taxes or revenues across income groups, regions and over time. This step was necessary as data series on key variables for LICs and LMICs were incomplete or missing altogether and could not be included in the second part of the methodology which involves a regression analysis. These factors are classified under six main groups:

1. **Macroeconomic and structural factors.** The variables used include GDP per capita and gross national disposable income (to account for remittances and other inflows from abroad); share of working age population; rates of general price inflation and the real purchasing power parity (PPP) exchange rates of countries. Public choice about government size can vary considerably across the world. This is accounted for by using regional dummies. Thus, for example, we should expect that otherwise identical economies in Western Europe and North America have different tax to GDP ratios. The results show that revenue collections are about 5 percentage points higher in Sub-Saharan Africa than in South and East Asia.

2. **Sector indicators and 'tax handles'.** These variables account for the sector composition of the economy. They include imports as a share of the GDP; earnings from tourism; mining valued added as a share of GDP; and natural resource exports as a share of GDP.

3. **Formal and informal sectors.** The variables under this group account for tax handles that make it difficult to raise taxes. Hard to tax factors (informal business entities; legal and illegal or underground trade and self- supply) are captured by share of the shadow economy; negative tax handles include share of rural population and agriculture value added in the economy; and positive tax handles include share of paid employees in adult population, and share of employee earnings out of GDP.

4. **Taxpayer capacity.** These factors account for the skills and capacities of the tax paying adult population that is a key enabler for ensuring tax compliance. The variables under this group include adult literacy, primary school completion ratios, and wage and salaried share of employment to proxy compliance capacity.

5. **Governance indicators.** Although effectiveness and efficiency of tax administration is a key determinant of revenue mobilization, it is especially difficult to find indicators of compliance and enforcement of tax regulations. The study uses the International Country Risk Guidance governance indicators such as conflict, corruption, law and order and quality of bureaucracy to measure administrative efficiency.

6. **Tax policy choices.** The variables under this group include trade-weighted tariff rates; general sales or value added tax rates, combined central and subnational personal income tax rates; and corporate tax rates. The authors also developed an overall tax policy variable in the form of a domestic tax rate indicator that combines the collective effect of these tax rates on tax collections. Although tax expenditures are a key tax policy choice, as data are not comprehensibly available across all regions and countries, these data could not be included in the analysis and is discussed separately.

Examples of variations in of these different factors are illustrated in Table 5 below:

Table 5: Data on select factors by income classes and in sample periods after year 2000

		Macroeconomic factors/ Economic structure		Formal and informal sectors		Taxpayer capacity	
		GDP per capita	% of working age population (15-65 years)	Agricultural value added/ GDP (%)	Paid labor force/ working age population (%)	Adult literacy	Adult primary completion rate (%)
LICs	Mean	745.0	54.7	31.0	17.6	54.8	46.2
	Std. dev.	430.0	4.9	11.1	11.4	23.7	30.2
	Observations	568	568	545	121	86	31
	No. of countries	58	58	57	40	49	20
LMICs	Mean	3,028.0	62.4	13.2	29.0	83.9	68.8
	Std. dev.	1,526.0	5.8	6.5	7.9	14.9	20.1
	Observations	486	494	464	291	100	91
	No. of countries	68	69	67	54	45	35
UMICs	Mean	8,464.0	66.3	6.5	38.0	94.0	84.3
	Std. dev.	3,069	3.8	3.3	8.0	5.3	11.4
	Observations	385	385	380	324	94	127
	No. of countries	50	50	49	47	37	38
HICs	Mean	40,034.0	67.6	2.2	48.2	97.9	94.0
	Std. dev.	19,096.0	3.1	1.7	7.5	1.9	7.4
	Observations	476	476	454	465	27	172
	No. of countries	43	43	42	41	12	32

Source: World Development Indicators, UN Data, International Labor Organization, UNESCO Institute of Statistics, 2016. **Abbreviations: Std. dev.** – standard deviation

As we look across the values of these indicators, we see very clear patterns and differences between income and regional groups. While average values of most indicators are in line with the average GDP per capita of a region, some indicators have large regional variations. The former USSR and Eastern Europe, for example, have higher revenue performance than expected for MICs, high shares of working age population, high shares of formal employment, high levels of education, and high goods import shares, but low income tax rates. East and South-East Asia have very high goods import shares, but low VAT/Goods and Services Tax rates.

If an indicator shows up as a distinguishing feature of a country group, it is also expected to explain differences in revenue performance between countries within a group. Importantly, however, some indicators are expected to have different strengths of impact within groups. For example, changing levels of GDP per capita, goods import shares and agricultural shares are expected to have stronger impacts within the LIC group, and possibly, have little or no impact within the HIC group.

Estimation of tax revenue capacity and effort

The second part of the methodology uses a regression analysis, which entails determining the tax and domestic revenue capacities of each income class given the economic characteristics, administrative efficiency levels, and tax policy choices that a country in its income class is expected to have. The tax and domestic revenue capacity is then compared to the actual taxes or revenues collected by the country in the year. "The **tax effort** (TE) is estimated as the actual taxes over the estimated tax capacity and the **domestic revenue effort** (RE) is the actual over the estimated domestic revenue of the country in the year." A ratio of actual tax to tax capacity of one can be interpreted to imply that a country is performing at its tax potential. Similarly, a ratio of actual revenues to revenue capacity of one can be interpreted to imply that a country is performing at its revenue potential.

The regression analysis makes two estimations of TE and RE: the 'basic' set focuses on the economic structures, and the regional and general economic characteristics. The second set of estimates includes tax rate indicators, which significantly increase the explanatory power of the estimations from around 40-60% up to 60-80%. However, due to lack of data on LICs and LMICs, the number of countries and years that can be used in the estimations is lower. Figures 7a and 7b show the trends in TE and RE across the income groups over the sample period of the study.

Interpreted broadly, the regression results are informative for prioritizing domestic resource mobilization efforts (see Table 7.7 in Glenday et al. 2018 for details). The key findings are:

- Among **LICs**, economic structure matters the most. The main determinants of domestic revenues are the share of the working age population, the share of goods imports in GDP, the share of agriculture in the economy, and global non-energy commodity prices. Foreign aid appears to increase the tax to GDP ratio. The revenue performance tends to be lowest in low-income East Asia. Administrative capacity does not seem to matter, but the tax rate does.

- Among **LMICs**, domestic revenues as a share of GDP increase with per capita income and goods imports, but the availability of foreign assistance may reduce the ratio of domestic revenues to GDP. Holding other things constant, revenue collections are higher in Europe and Central Asia, and lowest in South Asia. Administrative capacity (as measured by the political risk index) does not seem to matter, but the tax rate does.

- In **UMICs**, the determinants are essentially the same as for lower-middle income countries. The main differences are that higher global non-energy commodity prices and larger shares of mining in GDP seem to increase revenue performance somewhat, and Latin American and East Asian upper-middle income economies seem to underperform. Again, at least as measured, administrative capacity and tax policy choices do not seem to matter.

- In **HICs** (see Table 7.6 in Glenday et al. 2018), the only variable that really seems to matter for domestic

revenues is the composite tax rate. The structure of the economy does not appear to matter, and differences in societal choices seem to be captured almost entirely by differences in personal and corporate income tax rates and sales or value added tax rates.

The results indicate that UMICs have increased their tax and revenue efforts over the last two decades, but the performance of LICs and LMICs appear to be declining. When combined with the regression results discussed above, the findings are especially of concern for LMICs.

Figure 7a: Tax and domestic revenue efforts over 1987-2013 for average country in income group for basic specifications
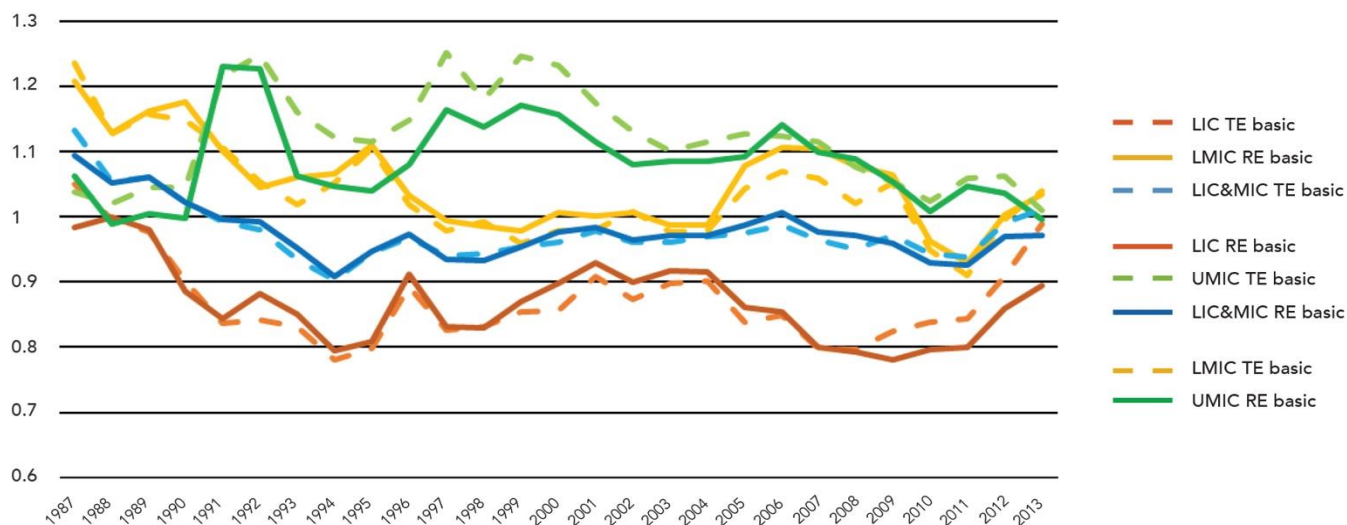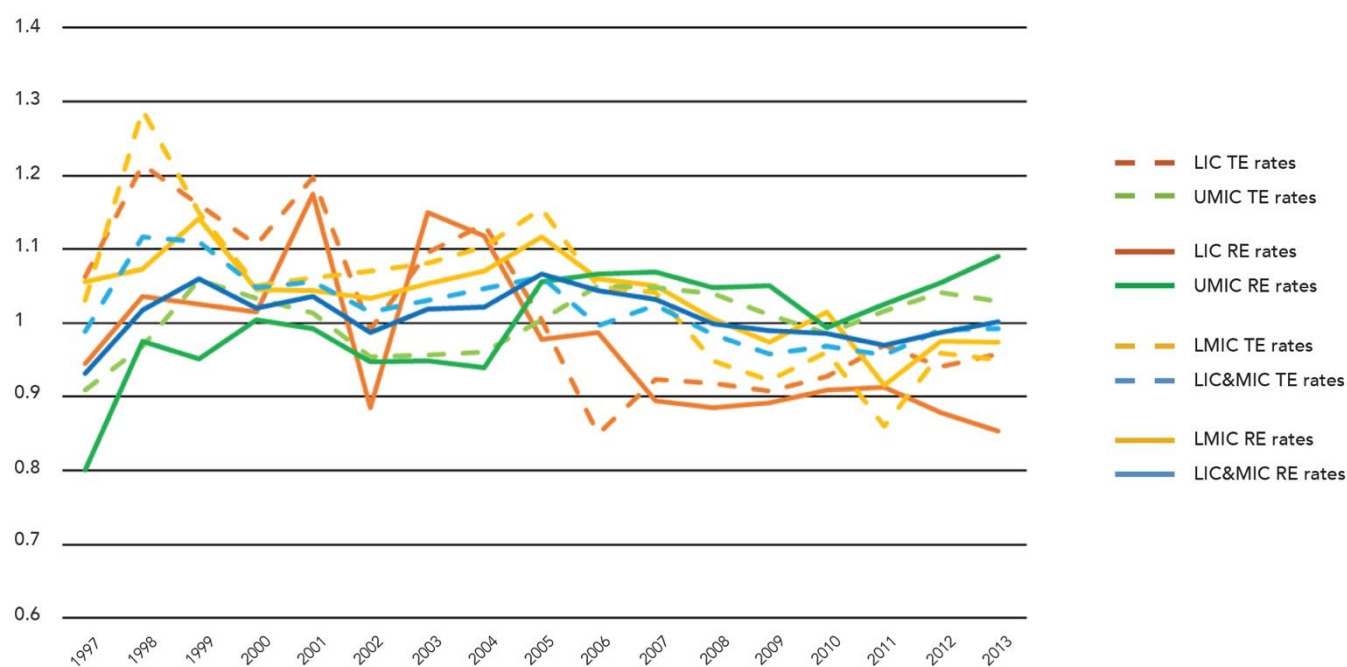

Figure 7b: Tax and revenue efforts over 1997–2013 for average country in income group for tax rate indicator specifications

Source: Glenday et al. (2018).
Abbreviations: TE – tax effort; **RE** – domestic revenue effort

Glenday et al. (2018) succinctly summarizes how these numbers should be interpreted: "If a country is underperforming (TE and RE well below 1) while having high tax rates, then some combination of poor tax administration and compliance and high use of tax expenditures would likely explain the poor performance. It is also possible that a country could have policies targeting small government size and their low revenue performance may be by choice. By contrast, a country with good performance (TE and RE well above 1) and low tax rates clearly has the potential to raise revenues with higher tax rates aside from further improvements in collection efficiency or rationalizing tax expenditures."

Glenday et al. (2018) has computed country-specific measures of TE and RE. Table 6 classifies countries into very high, high, medium, and low revenue effort using the preferred estimations of the study. The TE and RE for select LICs and LMICs are shown in Appendix 2.

Table 6: Countries classified by revenue effort

VERY HIGH REVENUE EFFORT 0.85) (indices above 1.2)	HIGH REVENUE EFFORT (between 1.0 and 1.2)	MEDIUM REVENUE EFFORT (between 0.85 and 1.0)	LOW REVENUE EFFORT (indices below
Botswana, Ukraine, Nicaragua, Namibia, Honduras, Brazil, Russia, Tunisia, Sri Lanka, Bolivia	Malawi, Sudan, Hungary, Vietnam, Poland, India, Mozambique, Malaysia, Colombia, Turkey, Bulgaria, Jordan, China, Uruguay, South Africa, Paraguay	Indonesia, Croatia, South Korea, Philippines, Costa Rica, Czech Republic, Estonia, Bangladesh, Panama, Latvia, Kenya, Romania, Lithuania, Thailand, Albania, Ghana	El Salvador, Guatemala, Pakistan, Egypt,Kazakhstan, Chile, Armenia, Yemen, Tanzania, Mexico, Madagascar, Uganda, Ethiopia

Source: Glenday et al. (2018): Table 7.10

Tax and revenue effort indices can also be computed for HICs. In general though, variation in these ratios among advanced economies are more likely to reflect social (and tax policy) choice than economic structures or administrative capacity.

PRINCIPAL IMPLICATIONS FOR GOVERNMENTS AND DONORS

The analysis summarized in this note has three main implications for governments of low and middle income economies and donors working with them to improve public financial management systems, mobilize domestic resources, and reduce reliance on external assistance.

- **Better measures of the quality of tax administration**
  The estimations used both the Worldwide Governance Indicators published by the World Bank and the political risk indicators from the International Country Risk Guide Researchers' Dataset. The Worldwide Governance Indicators were found to be unsatisfactory because they were highly correlated with each other. The estimations using political risk indicators found them to be weak determinants of administrative capacity, at best. This weakness could well be because these measures do not accurately reflect the compliance and enforcement of tax regulations. The more reliable measures would have been those estimated using the assessment of tax administration systems using the International Monetary Fund Tax Administration Diagnostic Assessment Tool (TADAT). But up until July 2018, these assessments were available for only 12 countries. The first step towards greater DRM should be a rapid expansion of the coverage of TADAT assessments. In addition, more attention needs to be paid to the development of a set of indicators to better track the tax administration capacity and performance of country revenue agencies and to measure the tax rates charged on the major tax bases.

- **More attention to tax expenditures**
  Tax expenditures typically range between 4 and 8 percent of GDP in low and middle-income economies. But they are generally measured poorly, and reported rarely or irregularly. Even where tax expenditures are regularly reported, they are generally only estimated at the central or federal government level. Better measurement of tax expenditures makes for better management of public finances. Since tax expenditures are often the least transparent parts of government spending, they are prone to misdirection, capture by privileged segments of the population, and outright corruption. Accurately measured and regularly reported tax expenditures can significantly improve DRM, both by raising revenues and redirecting spending to the most desired activities and sections of the population.

- **A special focus on lower-middle income economies**
  Table 7 reports the increases in taxes, contributions, and non-tax revenues during income transitions. It is hard to miss the relatively small increment in taxes and contributions in the transition from lower- to upper-middle income levels. While the average per capita GDP of the typical upper-middle income economy is nearly triple that of the average lower-middle income country, the average ratio of taxes and contributions to GDP increases by just 4 percentage points. Regression estimates in Glenday et al. (2018) show that greater foreign aid weakens revenue mobilization in lower-middle income economies (but not in low-income countries), a disturbing finding if confirmed. In countries such as Egypt, Nigeria, Pakistan, and Guatemala where revenue performance is weak (see Table 6), donors need to take greater care that their assistance is structured to facilitate domestic resource mobilization efforts, not discourage them. An additional aspect that needs strengthening among LICs and LMICs is improved coverage and quality of basic economic statistics, including the measurement of GDP, adult educational attainment and labor force composition and earnings (particularly for the urban informal sectors) in order to both better assess the tax capacity and to assist tax administrations more effectively target their tax efforts.

Table 7: Revenue increments with income transitions

INCREASE IN TAXES AND CONTRIBUTIONS (%GDP)	INCREASE IN NON-TAX REVENUE (%GDP)	INCREASE IN DOMESTIC REVENUE (%GDP)	TRANSITION
8.1	1.7	9.8	Low to lower-middle
4.0	1.0	5.0	Lower- to upper-middle
8.6	1.0	9.6	Upper-middle to high

Source: Glenday et al. (2018).

Appendix 1: Revenue performance and composition by countries by income class and in sample periods before and after 2000

		(%)			Taxes over GDP (%)			SSC over GDP (%)			Taxes & SSC over GDP (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
Low income country (LIC)	Mean	86.4	87.8	85.0	11.9	11.2	12.5	0.3	0.2	0.4	12.2	11.6	12.9
	Std Dev	16.9	18.3	15.3	6.1	6.5	5.6	1.1	0.9	1.3	6.4	6.6	6.0
	Min	21.8	21.8	36.0	0.6	0.6	1.0	-	-	-	0.6	0.6	1.0
	Max	100.0	100.0	100.0	45.9	45.3	45.9	9.8	9.8	8.8	45.9	45.3	45.9
	Observations	189	96	93	1107	558	549	1156	588	568	1156	588	568
	Countries	21	16	17	63	60	56	66	63	58	66	63	58
Lower middle income country (LMIC)	Mean	82.0	82.6	81.5	17.8	17.6	18.0	2.4	2.4	2.4	20.3	20.3	20.4
	Std Dev	17.1	15.9	18.2	7.8	7.0	8.5	3.6	3.7	3.6	9.2	8.6	9.7
	Min	17.2	17.5	17.2	3.6	3.6	4.6	0.0	0.0	0.0	4.4	4.4	4.6
	Max	100.0	100.0	100.0	62.8	44.8	62.8	19.5	19.5	13.3	62.8	45.7	62.8
	Observations	370	178	192	932	448	484	974	479	495	974	479	495
	Countries	46	31	36	84	68	67	85	70	69	85	70	69
Upper middle income country (UMIC)	Mean	81.5	79.7	82.3	19.4	18.7	19.7	4.9	4.6	5.0	24.4	23.5	24.8
	Std Dev	17.3	18.5	16.6	6.0	6.4	5.7	4.8	5.2	4.6	8.7	9.9	7.9
	Min	10.8	10.8	45.9	5.1	5.1	8.5	0.0	0.0	0.0	6.4	6.4	8.7
	Max	100.0	100.0	100.0	46.3	38.9	46.3	18.7	18.7	15.7	51.4	51.4	47.2
	Observations	291	96	195	584	207	377	606	221	385	606	221	385
	Countries	35	18	29	57	31	50	57	33	50	57	33	50
High income country (HIC)	Mean	64.4	61.2	66.3	25.2	26.2	24.6	7.8	7.7	7.8	33.0	33.9	32.4
	Std Dev	19.9	18.0	20.8	7.1	7.1	7.0	5.2	5.5	5.0	8.8	8.8	8.7
	Min	27.1	27.5	27.1	8.6	8.7	8.6	0.0	0.0	0.0	8.6	8.7	8.6
	Max	100.0	100.0	100.0	48.4	47.6	48.4	19.2	19.2	16.8	50.6	50.6	49.5
	Observations	690	262	428	830	340	490	832	342	490	832	342	490
	Countries	40	28	39	44	31	44	44	32	44	44	32	44

		Non-tax revenue over GDP (%)			Domestic revenue over GDP (%)			Grants over GDP (%)			Total revenue over GDP (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
Low income country (LIC)	Mean	**3.1**	**3.0**	**3.2**	**15.1**	**14.4**	**15.9**	**2.8**	**2.4**	**3.3**	**18.0**	**16.8**	**19.2**
	Std Dev	4.3	3.9	4.6	7.6	8.0	7.1	3.8	3.7	3.9	8.8	9.6	7.7
	Min	0.0	0.0	0.1	0.7	0.7	1.1	0.0	0.0	0.0	0.7	0.7	1.1
	Max	31.1	26.4	31.1	55.6	55.6	52.3	30.9	25.5	30.9	61.2	61.2	57.1
	Observations	1126	568	558	1126	568	558	1156	588	568	1126	568	558
	Countries	66	63	57	66	63	57	66	63	58	66	63	57
Lower middle income country (LMIC)	Mean	**4.8**	**4.6**	**5.1**	**24.7**	**24.5**	**25.0**	**1.0**	**0.9**	**1.1**	**25.8**	**25.4**	**26.2**
	Std Dev	5.3	4.0	6.3	9.6	8.8	10.3	2.0	1.9	2.1	9.8	9.0	10.6
	Min	0.0	0.1	0.0	4.6	6.5	4.6	0.0	0.0	0.0	4.6	7.1	4.6
	Max	40.8	22.0	40.8	68.2	54.9	68.2	17.1	12.5	17.1	72.6	58.5	72.6
	Observations	888	431	457	888	431	457	974	479	495	888	431	457
	Countries	79	64	64	79	64	64	85	70	69	79	64	64
Upper middle income country (UMIC)	Mean	**5.9**	**6.0**	**5.8**	**30.3**	**28.9**	**31.0**	**0.3**	**0.1**	**0.3**	**30.7**	**29.1**	**31.4**
	Std Dev	5.3	4.7	5.6	9.2	10.5	8.5	0.7	0.4	0.8	9.2	10.4	8.4
	Min	0.1	0.6	0.1	10.9	10.9	15.4	0.0	0.0	0.0	10.9	10.9	15.4
	Max	38.3	26.6	38.3	60.0	60.0	50.5	5.9	5.2	5.9	60.0	60.0	50.5
	Observations	500	161	339	500	161	339	606	221	385	500	161	339
	Countries	52	30	45	52	30	45	57	33	50	52	30	45
High income country (HIC)	Mean	**6.9**	**7.0**	**6.8**	**39.8**	**40.8**	**39.2**	**0.2**	**0.2**	**0.2**	**40.0**	**41.0**	**39.4**
	Std Dev	3.4	2.4	3.8	9.5	9.7	9.3	0.8	0.9	0.7	9.5	9.7	9.3
	Min	1.9	2.1	1.9	12.2	12.2	12.3	0.0	0.0	0.0	12.3	12.6	12.3
	Max	37.6	15.4	37.6	58.9	58.3	58.9	7.0	7.0	5.5	58.9	58.3	58.9
	Observations	758	273	485	758	273	485	832	342	490	758	273	485
	Countries	43	32	43	43	32	43	44	32	44	43	32	43

Appendix 2: Average Tax Effort (TE) and Domestic Revenue Effort (RE) for LICs and LMICs using capacity estimate specification including tax rate indicators over sample period listed by declining RE estimates

COUNTRY	TE RATES	STD. DEV	RE RATES	STD. DEV	RE RATES – TE RATES
Botswana	1.29	0.11	1.72	0.20	0.43
Ukraine	1.35	0.02	1.40	0.04	0.05
Nicaragua	1.19	0.01	1.39	0.03	0.20
Namibia	1.55	0.00	1.33	0.00	-0.22
Honduras	1.21	0.11	1.32	0.08	0.11
Brazil	1.45	0.05	1.30	0.04	-0.15
Russia	1.06	0.07	1.29	0.08	0.24
Tunisia	1.42	0.08	1.28	0.08	-0.14
Sri Lanka	1.12	0.04	1.22	0.04	0.11
Bolivia	1.32	0.22	1.22	0.18	-0.10
Malawi	1.19	0.17	1.17	0.20	-0.02
Sudan	0.51	0.03	1.15	0.16	0.65
Hungary	1.15	0.07	1.14	0.07	-0.01
Vietnam	1.04	0.06	1.11	0.06	0.07
Poland	1.05	0.02	1.11	0.02	0.05
India	1.15	0.12	1.07	0.06	-0.08
Mozambique	1.07	0.17	1.06	0.18	0.00
Malaysia	0.91	0.04	1.06	0.04	0.15
Colombia	0.87	0.07	1.06	0.05	0.19
Turkey	1.16	0.05	1.06	0.06	-0.10
Bulgaria	0.97	0.06	1.05	0.08	0.08
Jordan	0.99	0.02	1.05	0.04	0.06
China	1.11	0.03	1.03	0.03	-0.08
Uruguay	1.19	0.05	1.03	0.05	-0.17
South Africa	1.09	0.04	1.01	0.04	-0.08
Paraguay	0.82	0.00	1.01	0.01	0.19
Indonesia	0.94	0.13	0.99	0.06	0.05
Croatia	1.07	0.00	0.99	0.01	-0.08
Korea, Rep.	0.98	0.00	0.99	0.00	0.01
Philippines	1.23	0.21	0.98	0.15	-0.25
Costa Rica	0.99	0.02	0.95	0.02	-0.03
Czech Republic	0.99	0.04	0.95	0.05	-0.04

COUNTRY	TE RATES	STD. DEV	RE RATES	STD. DEV	RE RATES – TE RATES
Estonia	0.98	0.05	0.95	0.04	-0.03
Bangladesh	0.81	0.05	0.94	0.08	0.13
Panama	0.79	0.06	0.94	0.05	0.15
Latvia	0.97	0.05	0.92	0.05	-0.05
Kenya	1.06	0.04	0.91	0.05	-0.15
Romania	0.91	0.03	0.89	0.03	-0.02
Lithuania	0.96	0.05	0.88	0.03	-0.07
Thailand	0.88	0.04	0.87	0.04	-0.02
Albania	0.84	0.03	0.85	0.03	0.01
Ghana	0.88	0.03	0.85	0.03	-0.03
El Salvador	0.77	0.00	0.82	0.00	0.04
Guatemala	0.96	0.08	0.82	0.06	-0.15
Pakistan	0.86	0.03	0.81	0.05	-0.04
Egypt	0.79	0.00	0.81	0.00	0.02
Kazakhstan	0.92	0.06	0.79	0.05	-0.13
Chile	0.79	0.06	0.78	0.05	0.00
Armenia	0.76	0.04	0.78	0.05	0.02
Yemen	0.44	0.06	0.73	0.48	0.29
Tanzania	0.83	0.07	0.70	0.06	-0.13
Mexico	0.77	0.06	0.66	0.05	-0.12
Madagascar	0.74	0.11	0.65	0.10	-0.09
Uganda	0.84	0.06	0.61	0.04	-0.23
Ethiopia	0.63	0.06	0.61	0.04	-0.02

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