

Enhancing Domestic Revenues: Constraints and Opportunities

A cross-country comparative study of tax capacity,
effort and gaps

AUTHORS

Graham Glenday, Ipchita Bharali, Ziyuan Wang

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Authors

Graham Glenday is a professor of the practice of public policy at the Duke University Center for International Development (DCID) and co-director of the International Taxation Program, Project Appraisal and Risk Management, and Budget programs at DCID.

Ipchita Bharali is a Policy Associate at the Center for Policy Impact in Global Health at Duke University.

Ziyuan Wang is a PhD student at the Trachtenberg School of Public Policy and Public Administration at the George Washington University.

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List of Abbreviations

Corporate Income Tax	CIT
Development Assistance Committee	DAC
Domestic Revenue Mobilization	DRM
Financing for Development	FfD
Global Economic Monitor	GEM
Goods and Services Tax	GST
Government Finance Statistics	GFS
Government Revenue Database	GRD
Gross domestic product	GDP
Gross Domestic Product per capita	GDP pc
Gross National Disposable Income	GNDI
High income countries	HICs
International Center for Tax and Development	ICTD
International Country Risk Guidance	ICRG
International Monetary Fund	IMF
Local currency unit	LCU
Low income countries	LICs
Lower middle income countries	LMICs
Middle income countries	MICs
Millennium Development Goals	MDGs
Non-government organizations	NGOs
Official Development Assistance	ODA
Organization for Economic Co-operation and Development	OECD
Pay As You Earn	PAYE
Personal Income Tax	PIT
Purchasing Power Parity	PPP
Revenue Effort	RE
Social security contributions	SSC
Social security contributions	SSC
Southern African Development Community	SADC
Standard deviation	SD
Sustainable Development Goals	SDGs
System of National Accounts	SNA
Tax Administration Diagnostic Assessment Tool	TADAT
Tax Effort	TE
Total Revenue	TR
Union of Soviet Socialist Republics	USSR
Upper middle income countries	UMICs
Value Added Tax	VAT
World Development Indicators	WDI
World Economic Outlook	WEO
World Governance Indicators	WGI

Section 1: Introduction to enhancing domestic revenues: constraints and opportunities

1.1 Introduction

The Millennium Development Goals (MDGs)¹ of 2000-15 and more recently the Sustainable Development Goals (SDGs) of 2015² made explicit the need for effective delivery of a wide range of public services to underpin economic growth, social and development goals, particularly for developing and emerging economies. At the same time, it was recognized that progress on achieving the SDGs would require significant increases in financial resources of all types. The Addis Ababa *Financing for Development* (FfD) conference in mid-2015 highlighted these financial needs with a special emphasis on domestic revenue mobilization (DRM).³ This study provides a broad-based cross-country analysis of the constraints and opportunities for enhanced domestic revenues.

It is well known, and as documented in this study,⁴ that there are some regular patterns in government revenues. For example, low income countries (LICs) typically collecting about 16% of gross domestic product (GDP) in revenues compared to high income countries (HICs) collecting about 39% of GDP, but within each of these income groups, there is a large variation of DRM experience with standard deviations of some 7% and 10% of GDP, respectively.⁵ This implies that there is a need to understand why the DRM experience varies so widely both between as well as within groups of countries. While HICs are expected to set their DRM performance largely based on their revenue policy choices about the roles and sizes of government, LICs are expected to face a range of constraints on their DRM efforts. LICs, and to a lesser extent middle income countries (MICs), are expected to face structural constraints such as large informal sectors and weak taxpayer compliance capacity. These put limits on their DRM efforts, but LICs and MICs also make policy choices in the structure of their tax and non-tax revenue policies such as choices of tax bases, tax rates, revenue administration strategy and tax expenditures that affect their revenue outcomes. Hence, any understanding of the DRM options, particularly of developing countries, depends on being able to account for the impact of both the constraints and the policy choices on their revenue performance.

This study takes three approaches to understanding country DRM performance, constraints and options based on the most detailed and reliable revenue to GDP data available for general and central governments, namely the International Center for Tax and Development (ICTD) government revenue dataset.⁶ First, it analyses the revenue composition and performance across groups and over time. Second,

¹ The MDGs were the eight international development goals for the year 2015 established following the Millennium Summit of the United Nations in 2000, following the adoption of the United Nations Millennium Declaration. 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 among them. The United Nations led a deliberative process involving its 193 Member States, as well as global civil society. The goals are contained in paragraph 54 United Nations Resolution A/RES/70/1 of 25 September 2015. The Resolution is a broader intergovernmental agreement that acts as the Post 2015 Development Agenda (successor to the MDGs).

³ See for example, John McArthur, "What happened at the Addis financing for development conference," Brookings, July 21, 2015. <http://www.brookings.edu/blogs/up-front/posts/2015/07/20-addis-financing-development-conference-mcarthur#.Va-F28DFf00>

⁴ See Section 5, Tables 5.1 and 5.6.

⁵ This means that while domestic revenues as share of GDP for LICs cluster around 16%, most LICs are in the range of 9% to 23%. By contrast, HICs cluster around 39% of GDP, but most fall in the range of 29% to 49%.

⁶ Prichard, W., Cobham, A., & Goodall, A., "The ICTD government revenue dataset," ICTD Working Paper 19, Sept 2014. https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/10250/ICTD_WP19.pdf

it provides detailed comparison of the explanatory variables affecting country revenue performance including macro-economic and economic structural features, taxpayer and administrative capacity and tax policy choices, where data are available by country group and overtime. Third, it conducts detailed tax capacity estimates of the factors affecting the revenue performance within country groups in different income classes. Finally, it also assembles the currently available information on tax expenditures across countries and over time to reveal the major role that tax expenditure choices are making in the variation in country revenue performance.

This study also recognizes the growing interest in identifying “tax gaps” to measure and identify the reasons or shortcomings in the actual tax effort of a country. This study provides a framework that identifies seven different tax gaps that help link the tax performance to actual economic constraints on the revenue performance as well as the impacts of policy choices and revenue administration performances. Ultimately, enhanced DRM required actionable approaches and policies that depend upon understanding the constraints and opportunities facing a government.

1.2 Broader context of study

This study focuses on the potential of countries to raise aggregate domestic tax and non-tax revenues for the general government operations of a country. From the perspective of promoting particular sectors such as health services, however, a number added constraints and capacities have to be considered in the effective modalities of supporting the financing of the target sector as a whole and then specific activities or programs in that sector. Even if a country can raise extra domestic revenues, to increase some specific service delivery in a sector (vaccinations within the health sector, for example), successful achievement of incremental service delivery requires a sequence of budgeting and implementation steps to achieve this goal:

- (i) Sustained incremental sector allocations at the level of an overall medium-term program budget.
- (ii) Sustained incremental allocations to the desired activities or programs within the sector budget.
- (iii) Translation by the sector service delivery agencies of the incremental revenues into the desired incremental service delivery.

In addition, where subnational governments and their agencies are responsible for the sector or delivery of specific services, then the sector and program allocations and service delivery capacities at the subnational level need to be functional and budget allocations coordinated with the central government budget.

It is also recognized that added revenues required for priority expenditures can be obtained through (i) budget allocations from redundant or low priority programs, (ii) efficiency gains in service delivery reducing the unit costs of existing functions, and (iii) cost reductions such as interest rate suppression in the financing of government debt.⁷ Here, this study focusses on DRM without questioning the availability of these

⁷ Where governments have legal or monopoly powers to pay below market prices for inputs, this can effectively be regarded as a hidden tax on the supplier of these inputs.

alternative financing sources or the ability of a country to effectively use the added resources to fund incremental public services.

1.3 Structure of report

This study is composed of eight additional sections and, where necessary, annexes to provide more detailed results and background details than are contained in the main text. Section 2 provides some important background context to this study. In particular, it gives details of the major effects of rapid economic growth on the distribution of countries across income classes among a significant share of developing countries. It also discusses the ongoing changing foreign aid environment among both the official donor countries and the newly emerging donor countries and non-governmental organizations. Section 3 explains the relationships between revenue gaps, the tax capacity of a country and tax effort measures. Section 4 gives the detail of the tax and GDP data used in the study as well as the extensive range of explanatory variables drawn together for this study. It also gives the sources of the data and some discussion about the reasons for their inclusion given their expected explanatory power in determining the tax capacity of a country. Section 5 lays out the trends, variations and differences in taxes and domestic revenues across income class and regional country groups and over time. It also notes the differences between general and central government revenues across country income classes. Section 6 analyses the country group averages of the determinants of the tax capacity across the income class and regional country groups and over time. Section 7 gives estimates of the tax and domestic revenue capacity of countries within the major income class categories in terms of the available explanatory variables. It demonstrates how the explanations of tax and domestic revenue capacity changes across income classes and then provides estimates of the revenue and tax efforts of member countries in the income classes both without and with taking tax rate indicators into account. Section 8 provides the available information on published tax expenditures across countries and analyses their coverage by tax type and level of government as well as their comprehensiveness and methods of estimating tax expenditures. Finally, Section 9 summarizes the main findings and conclusions of the study about approaches to DRM and provides some recommendations for a way forward to enhance to fill in the major gaps in the understanding of revenue and tax capacity of countries identified by this study.

Section 2: Background context for domestic revenue mobilization

2.1 Introduction

Before entering into the detailed cross-country study of domestic revenue performance, constraints and opportunities, it is important to give some background context. The two areas highlighted here are, first, the major upward mobility across income classes of many developing countries over recent decades and, second, the evolving picture of the international aid flows by official donors and others.

2.2 Country mobility across income classes

Over the period covered by this study, 1975-2015, the world has witnessed a major transformation in the income class distribution of countries as many countries have shown significant upward mobility, particularly since 2000. Table A 1.1 gives the distribution of country numbers, population and GDP for all countries with data available in the World Development Indicators (WDI) database in 1980, 1990, 2000, 2010 and 2015. It is clear that the low-income country (LIC) class has shrunk dramatically over these years from having over half the world population to less than 10%, and about 5% of the world GDP to only 0.5%.⁸

While many economies were growing during the 1980-2000 period, not that many changed their income class. In addition, the data in the early years of the period was weak particularly among the LICs, and a large number of new countries were recognized through gaining their independence or through the breakup of the Union of Soviet Socialist Republics (USSR). The number of LICs with data peaked in 2000 at 63, but China transitioned from a LIC to LMIC in 1997 so that the LIC population declined in 2000 compared to 1990. The post 2000 period then showed a major transformation as many countries moved up the income classes. This is illustrated in Table 2.1.

Between 2000 and 2015, the number of countries in the LIC class halved from 63 to 31 and the population share dropped from 41% to 8.7% with only 0.5% of world GDP left among these LICs. This upward mobility from LIC to LMIC included the two large population economies of India and Indonesia. See Table 2.2. At the same time China and number of other countries, particularly in Latin America moved up into the UMIC class. See Table 2.3. These transformations have resulted in a large concentration of the world population (over 75%) in the MICs. At the same time, even though the number of HICs grew from 51 to 79 from 2000 through 2015, because many of these new HICs were relatively small countries and because economic growth rates of the HICs was lower than that of MICs, the share of world GDP in the HICs declined from 78.3% to 63.6%.

⁸ The country income classes are defined by the World Bank in terms of their GNI per capita in US\$ as calculated by the Atlas method. In 2015, LICs had GNI pc up to \$1,025, LMICs up to 4,035, and UMICs up to 12,475 and HICs above that amount.

Table 2.1: Distribution of population and GDP by country income class in a year for data available in WDI in 2000 and 2015

Year	Merged data country income class in year	Population (million)	Distribution	Number of countries	GDP (current US\$) (billion)	Distribution	Number of countries
2000							
	LIC	2,492	41.0%	63	1,090	3.3%	59
	LMC	2,050	33.7%	53	2,476	7.5%	52
	UMC	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
	LMC	2,970	40.4%	52	6,035	8.1%	50
	UMC	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

a. Number of countries with population estimate in WDI for year

b. Number of countries with GDP estimate in WDI for year

Source: Authors calculations

Table 2.2: Notable country transformation cases over 1975-2015

Transformation	Country	Change in GDP per capita (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: World Bank

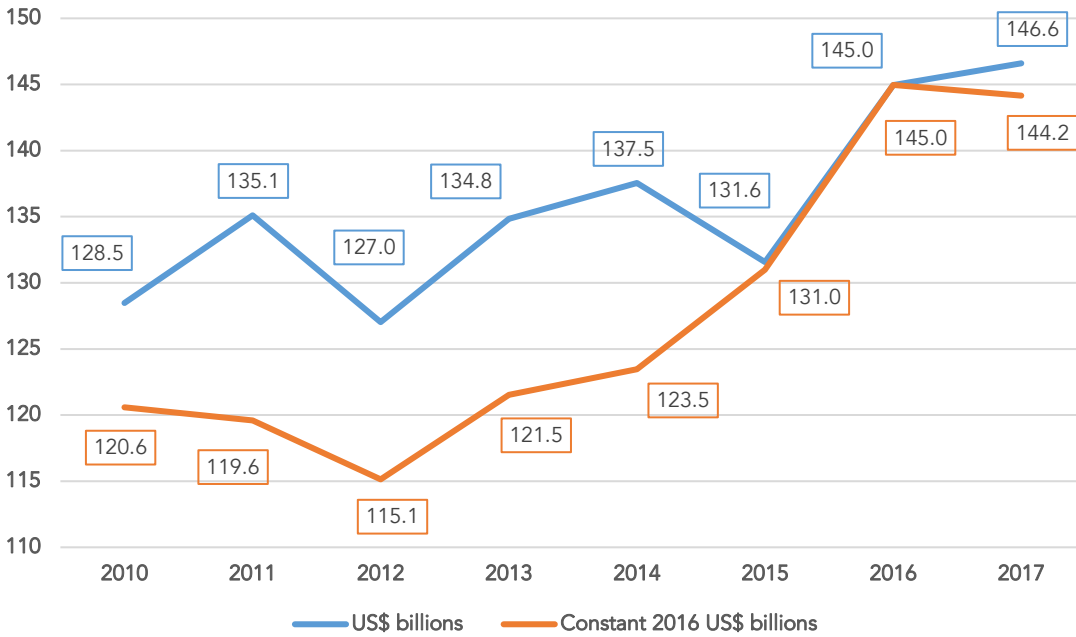
Table 2.2 also shows some of notable transformation of country income classes over 1975-2015. These include China moving up from a LIC to UMIC and Chile from LMIC to HIC. The table also illustrates the absolute size of the GDP per capita increases achieved over this 40-year period. Typically, this increment is much higher for countries transitioning from UMIC to HIC than LIC to LMIC for example, given the width of the income class brackets grow from \$1,025 for LICs to \$8,440 for UMICs to open ended for HICs above \$12, 475 in 2015 US\$. In fact, the GDP per capita increases over 1975-2015 for the typical HIC was in the range of \$20,000 to \$40,000 (2010 US\$).

These results paint a generally much brighter picture about the potential prospects for higher domestic resource mobilization with the growing size of the UMIC class in terms of both population (34.8% up from 10.8%) and GDP (27.6% up from 11%). This still leaves, however, about half of the world population and less than 10% of world GDP in LICs and LMICs where domestic revenue raising prospects remain challenging. While the size of the LIC group is greatly reduced, still some 40% of the world population is in the LMICs. This opens up opportunities for more concentrated targeting of growth-promoting and capacity-building aid to LICs and LMICs. At the same, all MICs and even some HICs still tend to have significant pockets of low-income persons that need well-targeted social services.

2.3 Evolving trends in international aid flows

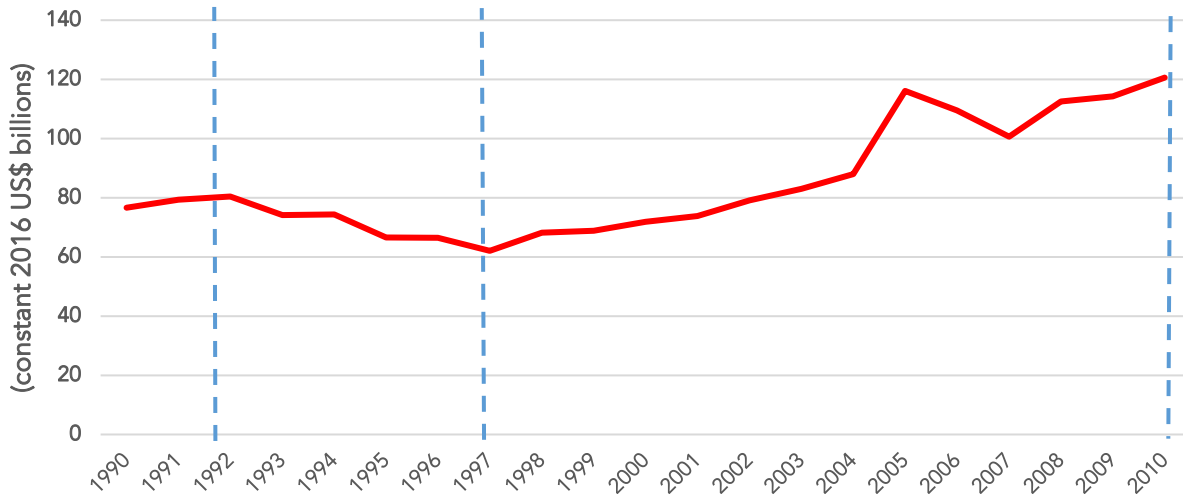
The development and announcement of the 2015 Sustainable Development Goals (SDGs) coincided with a period of lack luster growth in net official development assistance (ODA) from Development Assistance Committee (DAC) member countries. As Figure 2.1 shows, following the great recession of 2008-09, net ODA in constant dollar terms from 2010 through 2014 was essentially flat. This ODA pattern was a clear stimulus to the recognition that the achievement of the SDGs would not be able to rely on increased net ODA flows, at least from the DAC member countries. Subsequently, however net ODA from 2015 through 2017 is markedly up by some \$20 billion.

Figure 2.1: Net Official Development Assistance (ODA) by DAC members, 2010-17



Source: Organization for Economic Co-operation and Development (OECD) Data Tables (9 April 2018)

Figure 2.2: Net ODA by DAC members. 1990-2010



Source: OECD Data Tables (9 April 2018)

It is also important to put these recent net ODA flows in the context of their performance in recent decades. As Figure 2.2 illustrates, constant dollar net ODA flows peaked in 1992 and subsequently declined to a low in 1997. Often this aid slowdown is explained by the weakened aid motivations following the end of the Cold War era. Real net ODA flows picked up again, particularly within the framework of the 2000 MDGs, such that net ODA by 2010 was actually about double the amount in 1997 and about 50% higher than the 1992 peak level. Compared to any period before 2004, real net ODA flows from 2010 onwards have been high.

In addition to the net ODA flows from DAC members, Table 2.3 shows that there are more than an added \$50 billion in ODA equivalent flows coming from non-DAC members and non-government organizations (NGOs) or more than a third of the DAC member net ODA. Aside from significant donations coming from some Gulf States, the rapid economic growth by many emerging economies over recent decades has induced some, particularly the larger and more influential ones such as the BRICS countries, to become international donors. Given the data from the non-reporting non-member countries is not complete, particularly for China, the amounts net ODA may be significantly understated.

Table 2.3: Net ODA and other equivalent flows from DAC and non-DAC countries and from NGOs

Years	2000-2001 average	2005-2006 average	2012	2013	2014	2015	2016
<i>USD billion</i>							
Net Official Development Assistance from DAC member countries ^a	53.4	107.0	127.0	134.8	137.6	131.6	145.0
Non-DAC members reporting net ODA disbursements ^b			6.1	16.3	24.6	17.5	14.5
Non-DAC members not reporting net ODA disbursements, estimates ^c			5.2	6.4	5.1	NA	NA
Net grants by NGOs ^d	7.1	14.8	35.4	34.2	32.3	35.4	40.3

a. OECD Table 2. Total Net Flows from DAC Countries by Type of Flow.

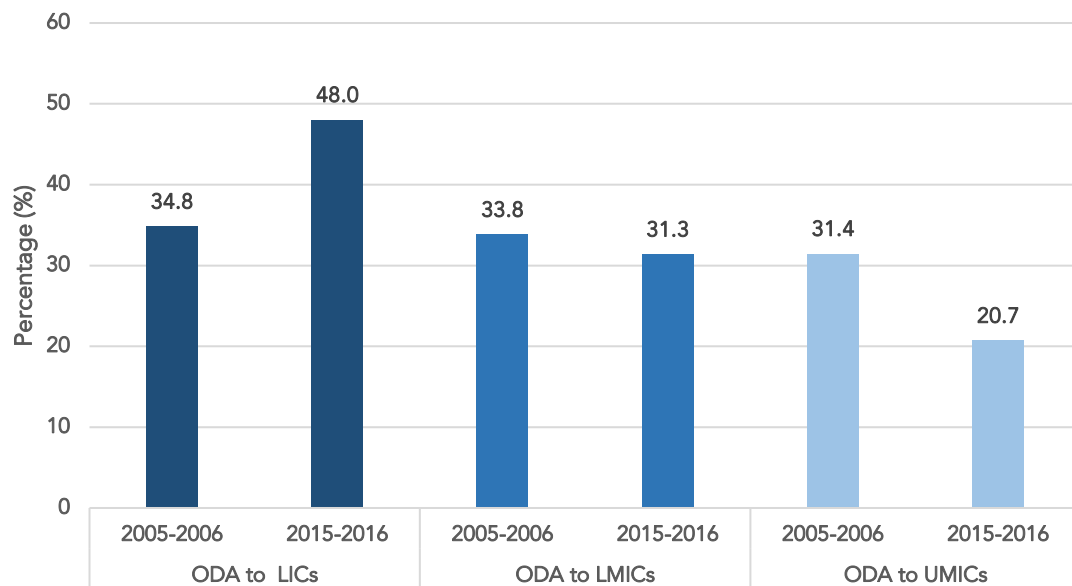
b. OECD Table 33. Concessional flows for development from non-DAC providers of development co-operation. Russia, Turkey, Saudi Arabia and United Arab Emirates have reported net ODA disbursements of over US\$1 billion in a year.

c. OECD Table 33a. Estimates of concessional finance for development (ODA-like flows) of key providers of development co-operation that do not report to the OECD-DAC: Brazil, Chile, China, Colombia, Costa Rica, India, Indonesia, Mexico, Qatar, and South Africa. India and Qatar have reported aid disbursements of over US\$1 billion in a year and China in excess of US\$ 3b a year.

Source: OECD

Finally, as noted above in Table 2.1, there has been a significant decrease in the number and population in LICs. This opens up a major opportunity for development partner countries to concentrate further net ODA flows on LICs. To some extent, this is already happening. As Figure 2.3 illustrates, between 2005-06 and 2015-16, the share of ODA going to LICs has increased from 34.8% to 48%. At the same time the number of LICs has been falling. Clearly, this focusing of aid flows on LICs could even be strengthened given LMICs and especially UMICs would have greater capacity to enhance their domestic revenues than LICs as will be elaborated on in the remainder of this report.

Figure 2.3: Net disbursements as a percent of total ODA by all DAC members^x



^x OECD Table 26. Distribution of ODA by Income Group:

^a Including imputed multilateral ODA. Excluding more advanced developing countries and territories, and amounts unspecified by country.

Source: OECD

Section 3: Explaining revenue gaps, capacity and effort

3.1 Introduction

One basic approach to identifying domestic revenue mobilization opportunities is to analyze the types of revenue gaps that can exist in an economy, the sizes of these gaps and whether they are amenable to being closed. The sources of domestic revenue that are considered here are non-tax and tax revenue. External grants are not considered here, though in later analysis of domestic revenue the impact of these on actual domestic revenue performance is considered and estimated. It is also recognized that domestic revenue for any specific purpose can be effectively gained through more efficient delivery of other public services to release budget allocations for incremental services. While initially some discussion of non-tax revenue is provided, most of this section will deal with tax gaps and tax capacity and performance.

3.2 Non-tax revenue gaps

Non-tax revenues consist of two primary types. The first are user charges based on the use of public services, which could include utilities, transport services, medical services, educational services, etc. where the public has some discretion in the level of use of the service that provides some direct benefit to the user.⁹ Second, charges for the use of public property including land, buildings, houses, natural resources, and intellectual property or income earned from the ownership of enterprises, which could include mines and oil wells. These non-tax revenues are typically regarded as desirable for financing government. A user charge basically follows the benefit principal of a market price and captures some of the willingness to pay for the service user and saves the public sector from raising tax revenues on some unrelated economic activity to provide for the public service. Similarly, charges on the use of public property follow a market benefit principle of finance, but are even more attractive in terms of low economic efficiency cost if they effectively capture the rents that can be implicit in natural resource exploitation, especially mineral and energy resources. As noted in subsequent sections, where these natural resource rents are large relative to the public sector needs of a country, they may largely displace the need to raise tax revenues. The cases of the “oil-revenue dominated” countries is illustrated in Section 5.

Despite the attractiveness of non-tax revenue, countries face constraints that may limit their effective use. Three are noted here. First, in the area of natural resource rents, the potential existence of rents (or economic surplus) available for collection through some combination of tax and non-tax (typically royalties and dividends from public ownership) does not guarantee the collection of these revenues. Many resource rich countries have failed through a mix of poor policy and poor governance (often including corruption) to capture their fair share of these rents. It is also often difficult to reverse the combination of laws, regulations and contracts that are generating a poor public revenue outcome because of a combination of strong lobby groups and often the existence of policy stability agreements with the companies.¹⁰

⁹ It is recognized that there is some grey areas in classifying government fees for licenses, registrations, passports, etc. that are designed to recover all or some of the costs of administration. While some of these often get classified as non-tax revenues, they are more properly classified as a fixed tax on the private person who gets no direct benefit out of the license, registration, passport, etc. The private person is required to pay the fee in order to get any benefit out of the conduct of a business, profession, charitable activity, international travel, etc. This fee is effectively a fixed input tax on the conduct on the activity, just like a property tax on the land used to conduct some economic activity is a tax.

¹⁰ Philip Daniel, Michael Keen and Charles McPherson (Eds), *The Taxation of Petroleum and*

The second constraint arises from the technical or administrative costs of collecting non-tax revenues (in a similar fashion to tax collection modalities discussed below.) The use of a non-tax revenue type can be excluded if the share of administration costs out of the revenues is excessively high. An example comes out road finance. Instead of some combination of vehicle registration fees, targeted fuel taxes and general revenues, toll charges can be collected for trips. The administrative costs of tolls depend on the collection technology. These can be relatively high for tollbooths collecting fees manually, but drop as automated billing is possible with bar codes, scanners, cameras and digital billing and payments, and may drop even further with GPS tracking of vehicles road use. Collection costs can also be high when there are few users paying small fees and collection costs are mainly fixed costs.

The third and critical issue arises with the income level of the user of basic needs services such as primary education or basic health services. In such cases, a combination of low affordability by the user and positive economic externalities may argue for no user charges and, in some cases, even to provide a subsidy to encourage usage. As income levels in a country rise, the affordability problem moderates and the share of the population needing free or subsidized services falls. This indicates an expectation that non-tax revenues as a share of GDP are expected to rise with income levels.

3.3 Tax revenue gaps

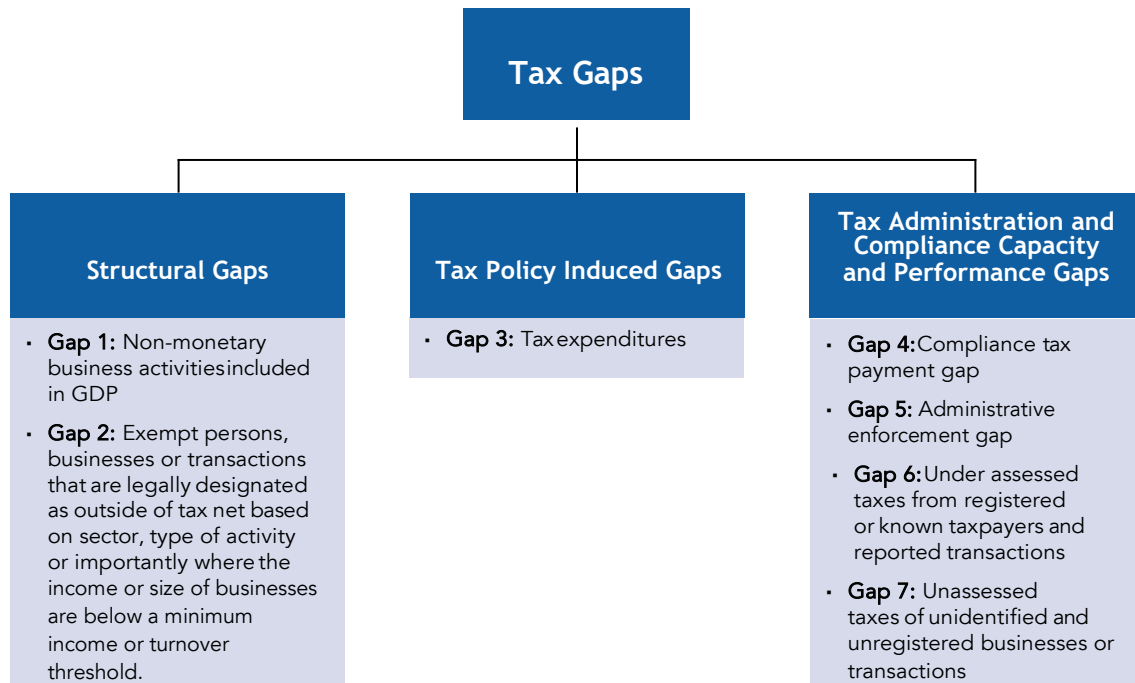
Before considering the concepts of tax capacity, performance and effort, it is useful to review the range of sources of tax gaps as these reveal the possible causes and potential solutions to what may appear to be underperformance in tax revenue collections in a country. The basic concept of tax gap is to estimate the gap between (a) some potential or theoretically estimated tax base or tax yield and (b) a measure of the actual tax performance in terms of the effective base brought under tax or the actual tax collected. The potential tax estimates are typically derived from either aggregate national statistics or detailed disaggregated household and industrial sector data related to the target tax base (income or consumption, for example). The gaps between the potential and actual tax can broadly be broken down into three broad types of gap arising from:

1. **Structural features of the economy** which often make tax collection technically infeasible (the base cannot be measured) or cost-ineffective to collect, and hence, parts of the estimated base are practically and often legally excluded from the base
2. **Tax expenditures or tax policy choices** to (a) set tax rates on components of a tax base (to achieve some desired revenue, efficiency and distribution effects) and (b) differentiate tax obligations in the law to favor certain groups or types of transaction that would otherwise be subject to tax under the base line tax structure.
3. **Tax administration and compliance capacity and performance** gaps which can potentially be tackled through policy and tax administration measures

Accordingly, tax gaps are classification under these three headings into the following seven tax gaps under these three basic tax gap types. For more elaboration, please see Box 1.

Minerals: Principles, problems and practice, IMF, Routledge (2010); Barma, N.H., Kaizer, K., Le, T.M. and Vinuela, L., *Rents to Riches? The political economy of natural resource-led development*, World Bank, Washington DC (2012).

Figure 3.1: Classification of Tax Gaps



Tax collection efficiency typically measures of the estimated tax base and potential tax after making adjustments for Gaps 1 and 2, and possibly also Gap 3 relative to the actual taxes collected through voluntary (Gap 4) and enforced collections (Gap 5). The short fall in revenues can be broken down into under or late payment of self-assessed taxes (Gap 4) and under collection of arrears, reassessments, penalties and interest (Gap 5) while the remainder arises from under or wrong declarations arising from administrative audit and deterrence failures (Gap 6) and from unknown untaxed business activities (Gap 7). Gap 3 can be reduced through tax policy, while Gaps 4 through 7 represent increasingly greater challenges to tax administrations to enforce and encourage tax compliance through better taxpayer education and service. In addition, in the case of the credit-method value added tax (VAT), there is the problem of delayed refunds and credit carryforward absorption, which can result in over collection of revenues or a negative tax gap.

Box 1: Elaborated classification of Tax Gaps

Structural gaps

- Gap 1 = Non-monetary business activities included in GDP: This is typically only important in low-income countries with a significant share of the population conducting subsistence agriculture and house construction outside of the monetary market. This over estimates the taxable monetary base and also includes in the population count persons subsisting outside of the monetary economy which can bias the estimate of the monetary GDP per capita. Prior to 1993, some countries estimated the non-monetary production separately from the monetary GDP.¹¹ Since then, the non-monetary component of the agricultural sector typically is not estimated separately in production accounts. Ideally, separate estimates of the value and population in the monetary and non-monetary economies are required, but these seldom exist or are published. The share of value added in agriculture in GDP has to be used as an indicator of its potential size and negative effect on the realized tax performance among lower income countries.
- 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: Such exemptions should be based on estimates of technical inefficiency of tax collection (or the costs of administration and compliance are high relative to the revenues) or high difficulty in measuring the base (as occurs in the banking and long-term insurance sectors) or some generally applied rule for protecting some minimum individual or household level of income from taxation. Often the technical efficiency and the distributional criteria overlap such as in the tax treatment of small and micro businesses. Typically, these types of exemption, which effectively exclude parts of the theoretical tax base, are also taken to form part of base line tax structure for tax expenditure accounting. Structural features of an economy such as having a large small-scale farm sector, or large urban informal sector or large shadow economy, would be indicators of the size of this gap. In developing countries, these sectors are also typically characterized by workers with low tax compliance capacity arising from low general levels of education as well as a lack of specific skills to comply with tax obligations. Technical efficiency of tax collection is the primary tax design criteria among LICs. Technically feasible and cost-effective tax bases are referred to as good “tax handles.” These include goods imports through formal ports, large formal corporate businesses including mines, formally employed persons, etc. The informal sector of an economy is traditionally hard to tax, and hence, indicators of the possible extent of this are important, but at the same time are often poorly captured in national accounts and labor force statistics, especially in LICs.

As noted below in a simple illustration of tax gaps, these two gaps arising out of the structural features of an economy often explain a large share of the overall tax gap.

Tax policy induced gaps

- Gap 3 = Tax expenditures: These arise from specific policy measures that deviate from the base line tax structure in order to benefit or incentivize specific groups of taxpayers, but cause the loss of revenues. Like direct expenditures, tax expenditures may be economically justifiable or not (“good” or “bad” expenditures), but in either case should be scrutinized and accounted for. Tax expenditures should be accounted for in a fiscal year through estimating from the tax documents what would have been collected in the absence of the tax policy. Some taxes and tax expenditures remain unaccounted for because taxpayers are not identified and registered or wrongly assess and pay a tax and the under

¹¹ United Nations et al, System of National Accounts 1993; OECD, *Measuring the Non-Observed Economy: A Handbook*, 2002; EuroStat, *Statistics Explained* (2017) (<http://ec.europa.eu/eurostat/statisticsexplained/>)

assessment remains undetected. Note that removing such a tax expenditure policy will not close this latter gap, but rather the administrative gaps described below have to be closed before the additional tax expenditure is effectively created, and hence, can be removed or affected by a policy change. Tax expenditures are only collectable if the tax, which otherwise would have been forgone, is assessed and paid.

Tax administration and compliance capacity and performance gaps

- Gap 4 = Compliance tax payment gap: Ideally with a self-assessed tax system, taxpayer file returns and make tax payments on time. Hence, a basic tax gap is the assessment of whether this level of compliance is achieved. Self-assessed taxes minus self-assessed tax collections or timely refund of negative self-assessed tax (or new net arrears). For example, In the case of VAT new arrears are offset by new outstanding credits (self-assessed net VAT credits are offset by timely refunds or credit carry forwards absorbed). The new net arrears could be negative, or the government actually owes the taxpayer net refund. Under refunding can often mask under collection of positive VAT.
- Gap 5 = Administrative enforcement gap: After the due date, tax administrations conduct audits, reassess taxes and refunds, assess penalties and interest, taxes are collected from late payments of self-assessed taxes and from new assessments, and net refund payments are made. Hence, late or reassessed additional taxes less added reassessed refunds, plus penalties and interest assessed plus all administratively assessed taxes minus collections of all non-self-or late assessed taxes and all late collection of self-assessed taxes less all reassessed and late refunds form the administrative tax gap. In the case of VAT, reassessment of credits and new outstanding credits less payment of outstanding refunds and absorption of tax credit carryforwards offset fully or partially the positive tax arrears.

Alternatively, the combined compliance and administrative enforcement gaps can be identified, but separating the two is important to check if the major self-assessment component of a tax is on track.

- Gap 6 = Under assessed taxes from registered or known taxpayers and reported transactions: Gap arises from under declaration, misreporting, transfer pricing, etc. that are not captured by audits and reassessments. This is a weakness in administrative enforcement and taxpayer service leading to weak deterrence effects and low compliance. The extent of this gap has to be gauged by using routine or special audit results of past tax returns to estimate the under declared taxes in the non-audited returns.
- Gap 7 = Unassessed taxes of unidentified and unregistered businesses or transactions: These are non-exempt persons or transactions in the monetary sector that should be registered or declared, but are not due to moonlighting, underground or criminal activity, cash businesses, smuggling, etc. Estimating this gap requires reliable census and survey data to estimate the number and sizes of businesses and individuals that are not registered but active under each of the tax types and the related forgone revenues. This also represents a tax administration failure. In practice, where informal sectors are large the share of identified non-exempt persons may be significant and hard to distinguish from the legally exempt persons in Gap 2. The same economic structural features that increase Gap 2 are likely also to increase Gap 7.

3.4 Tax capacity and tax effort

The size of government (or total government expenditures as a share of the economy) is a matter of public choice, but this choice is constrained particularly for lower income countries by the characteristics of an economy that affect the feasibility and costs of raising sustainable revenues to finance government operations. Certain features of an economy make for more or less cost-effective revenue raising efforts.

Features that have low administrative and compliance costs of revenue collection are referred to as “tax handles.” Good tax handles include imports forming a high share of the economy, most imports entering through well-controlled sea, air or rail ports, large formal sector mining operations, and a large share of business activities conducted in large formal sector corporations. By contrast, other features of an economy can make for difficult tax collections. These include a large non-monetary or subsistence agriculture sector, a large informal or micro-business sector with poor books and records, a weak accounting profession, and low levels of literacy and numeracy which undermine the ability of the private sector to self-assess taxes such as income tax or VAT. These types of structural characteristics affect the “tax capacity” of a country or the feasibility of a country to administer different types of tax.

Historically, all countries' tax systems were limited to the feasible tax handles, typically taxing trade at ports and city gates, or taxing specific types of domestic production – the origins of “customs and excise.” The twentieth century saw the emergence of the broad-based taxes in the high-income OECD countries that generated the substantial revenues currently observed in these countries. The growth in revenue yields of the public sector, which resulted in these countries now averaging around 45% of GDP (with a spread of about 10 percentage points around this mean), depended upon two key structural features developing in these economies. First, the growth in labor income in terms of both the wage rates earned and the number of workers earning high enough amounts to justify taxing increasingly high shares from their income. Second, the emergence of companies offering formal employment arrangements and maintaining accounts in a way that the efficient payroll deduction and Pay As You Earn (PAYE) systems became feasible for most workers. These deductions at source from payrolls now form the backbone of revenue collections. Formal business entities also allowed the corporate income tax, the broad-based sales tax, and later, VAT implementation. Most developing and emerging economies have inherited or adopted these broad based taxes, but the underlying structural features of these economies only allow these taxes to apply in limited parts of their economies. For low-income countries the choice of a government collecting 50% of GDP in revenues, for example, is not an option. Hence, exploring the nature of these constraints on revenue mobilization is important.

Table 3.1: Level and composition of central government revenues by country groups, 1997-98

			Shares of current revenue								
Country Group	Year		Current revenue as share of GDP	Tax revenue as share of GDP	Tax revenue	Taxes on trade	Taxes on goods and services	Taxes on income, profits, etc.	Social security taxes	Other taxes	Non-tax revenue
<i>Percentages</i>											
LIC	1998	As reported	13.4	11.0	82.2	20.9	27.9	16.2	0.0	1.5	13.2
LMIC	1998	As reported	18.5	16.0	86.6	9.7	36.6	19.5	4.0	2.6	13.6
LIC	1998	Adjusted	13.4	11.0	82.2	25.8	34.5	20.1	0.0	1.9	17.8
LMIC	1998	Adjusted	18.5	16.0	86.6	11.6	43.7	23.3	4.7	3.2	13.4
UMIC	1997	As reported	19.9	17.7	88.9	4.3	39.5	16.2	28.2	3.6	10.5
HIC	1997	As reported	28.4	25.9	91.2	0.04	27.3	28.6	19.7	15.5	8.6

HIC OECD	1997	As reported	28.4	26.0	91.6	0.003	26.6	29.8	25.0	10.2	7.3
European Monetary Union	1997	As reported	36.9	33.6	91.1	0.0	26.0	29.7	33.4	2.0	6.4

Source: WDI 2004; authors' calculations

The impact of the structural features on the tax capacity of a country shows up strongly in comparisons of the level and composition of central government revenues across different groupings of countries at different per capita income levels. Table 2.3 gives the level and composition of central government revenues from the World Bank World Development Indicators (WDI) for 1997 or 1998 for groupings of countries according to per capita income.¹² These results show that overall central current revenues rise from the low-income group at 13.4% of GDP to the high-income group at 28.4% of GDP (and 36.9% of GDP among the European Monetary Union countries) in 1997-98. Tax on international trade at 25.8% of current revenues is important among low-income countries, but is negligibly small among high-income countries. Taxes on goods and services are important among all country groupings. Taxes on income, and especially social security taxes (which are generally payroll or employment taxes), however, rise sharply from the low-income countries to the high-income countries. Combined income and social security taxes form only about 20% of current revenues among low-income countries, but rise to nearly 50% among high-income countries and about 64% among the European Monetary Union countries. Section 5 below reviews the trends in general and central government revenues both across various country groups and over time in more detail.

These patterns of revenues across income groups reflect both the need for low-income countries to rely on tax handles (such as border collections on trade) and the difficulties of collecting direct taxes that require both formal business accounting practices and income levels of individuals to be high enough above some minimum threshold to be subject to tax. Low-income countries are characterized by factors that make the collection of tax infeasible, expensive and/or unproductive. These include:

- (i) significant non-monetary sectors (or subsistence agricultural sectors);
- (ii) a large share of the economic activity in the agricultural sector resulting in widely dispersed business activity with much of it conducted by small scale farmers with poor books and records;
- (iii) large numbers of informal businesses in small scale agriculture, manufacturing, trade and services that mainly operate without books and records;
- (iv) large unskilled labor force with wages levels that are largely income-tax exempt or only in falling in the lowest tax brackets;
- (v) weak accounting standards and relatively few professional accountants to maintain books and records for tax purposes; and

¹² The data for 1997-98 was chosen as fairly complete data is available for that period from the World Bank. Note that the shares of current revenue for different groupings of countries as reported in the WDI database do not necessarily add up to 100 per cent, particularly in the low-income and lower middle-income groups because of missing data and weighting problems in aggregating the data. As a result, adjustments were made to the shares of revenue by source to scale them such that they add up to one hundred percent.

- (vi) low educational attainment or relatively high illiteracy rates that make compliance with self-assessed taxes such as the income tax or VAT difficult.

Structural features constrain the ability of low-income countries to collect taxes on income, but as income levels grow the structure of the economy changes. Importantly, the middle class becomes an increasingly large share of the economy so that in the middle-income countries, income taxes, particularly payroll-based taxes, become feasible for a higher share of workers and the base grows rapidly as individuals both become taxable and move up into higher tax brackets. At higher per capita income levels, choice over the size and role of government becomes possible rather than the constraints on revenue collections limiting the target yield for taxes. In addition, once top tax rates have been set, tax revenues as a share of the economy are limited by these rate choices and will approach maximum yields as the efficiency of any tax rises (or the share of the economy subject to these maximum rates approaches its maximum potential.) By contrast, among low-income countries it is more typically the size and nature of the informal sector that constrains tax yields.

The informal sector forms a major constraint on tax capacity because it contains the non-monetary sector of an economy as well as those smaller producers and traders conducting unincorporated business activities with no or very incomplete business books and records. Informality at one extreme could arise from lack of literacy and numeracy, or from a lack of specific training in business management practices – generally, the sector lacks the capacity to comply with modern taxes. Typically, the scale of business activity may be such that they fall under the minimum turnover level of a sales or VAT and/or below the minimum income at which income tax would be charged. Such businesses with a lack of compliance capacity should be distinguished from small and micro-businesses, which are capable of tax compliance, but fall below the taxable limits. They should also be distinguished from the capable businesses that partially or completely fail to document their business activities and go unrecorded in direct statistical measures of economic activity or are unreported in any tax assessment. These are the underground parts of the economy – capable, but evasive. The shadow economy includes all these parts that fail to register, report or comply. It is the non-monetary and the small and incapable parts of the business sector that represent the real constraint on taxation. Often informal business activity is recognized statistically as partly rural, small-scale farmers and informal farm workers, and partly as urban informal businesses largely in trading, personal and businesses services and small-scale manufacturing, often with no permanent business premises.

The non-monetary sector in an economy is characterized by subsistence agriculture and self-supplied housing. In low-income economies such as Malawi, Tanzania and Kenya, these were estimated to be significant shares of GDP, and hence, raise issues of comparability of tax capacity across countries. Malawi national accounts reported the self-consumed production of smallholder farmers as an estimate of the non-monetary sector valued in GDP. Between 1994 and 2003, the non-monetary sector in Malawi was reported by the National Statistical Office to have grown from 18.5% to 27.4% of GDP as the relative size of the smallholder-farming sector grew. National accounts reported by the Central Bank of Tanzania showed the non-monetary agricultural sector at 30% of GDP at factor costs in 1986, then falling to 26.1% in 1990 and rising again to 29.9% by 1999. In Kenya, the non-monetary sector over the 1990s was typically reported at around 5.5% of GDP. Unfortunately, not all low-income countries estimated and reported the share of the non-monetary sector. Ideally, a measure of the size of the non-monetary sector included in the GDP in each country would be an important variable to explain tax capacity through cross-country comparisons of its impact on tax yields. Unfortunately, now countries are including the non-monetary sector as part of their GDP estimates as required under System of National Accounts 1993 (1993 SNA) and

are typically not indicating the relative size of the non-monetary (production of households for own final use) or other components of the Non-Observed Economy.^{13,14}

Few countries are able to report the size of the informal labor force, whether in the rural or urban sectors. Kenya, for example, does report some estimates that are suggestive of the importance of the informal sector in the economy as a limiting factor on taxation. For example, The *Economic Survey* reported that out of a population of 32.2 million in 2003, only 1.8 million are employed in the modern or formal sector and a further 5.5 million are employed in the non-agricultural informal sector. Based on *WDI (2005)* labor force estimates, then this leaves some 9.3 million working in monetary or non-monetary agricultural activities. Compared with a decade earlier, the modern sector employment had grown by only 17% whereas the non-agricultural informal employment had grown by 85%,¹⁵ and the agricultural informal workers by 18%. Clearly, these results point to a shift of workers into the non-agricultural, urban informal activities. A major problem exists for any growth in direct taxes based on deductions out of wage income. Again, estimates of the size of informal employment, whether in the agricultural or other sectors are not typically available in labor force statistics for cross-country comparisons.

Tax capacity studies, as a result of the lack of or weak labor force data, have typically resorted to using the share of the agricultural sector¹⁶ both as an estimate of the taxing problems in that sector and as a proxy for the relative size of the overall informal sector. As the Kenya data points out, where the non-agricultural informal sector is growing rapidly, it may be underestimating the structural problem.

Subsequent sections of this study elaborate on the actual variables used in explaining tax capacity as well as the problems in the availability of data that would be desirable to explain differences in the capacity of a country to raise revenues.

3.5 Tax capacity and tax effort approach

Given the discussion of the difficulties in directly measuring and explaining tax gaps, particularly in lower income countries, the approach of estimating tax capacity and tax effort provides a useful indirect approach to assessing the ability of countries to enhance their revenue performance. This approach, which has a long history of development at least since 1979,¹⁷ recognizes that key tax handles and tax collection structural constraints in an economy as well as fiscal policy choices can be used to explain why tax and

¹³ 1993 SNA definition of the Non-Observed Economy includes:

1. *underground production*, defined as those activities that are productive and legal but are deliberately concealed from the public authorities to avoid payment of taxes or complying with regulations;
2. *illegal production*, defined as those productive activities that generate goods and services forbidden by law or that are unlawful when carried out by unauthorized producers;
3. *informal sector production*, defined as those productive activities conducted by unincorporated enterprises in the household sector that are unregistered and/or are less than a specified size in terms of employment, and that have some market production;
4. *production of households for own final use*, defined as those productive activities that result in goods or services consumed or capitalized by the households that produced them.

¹⁴ See OECD, *Measuring the Non-Observed Economy: A Handbook*, 2002, Chapter 11.

¹⁵ There is also some evidence the per capita income of the non-agricultural informal sector has dropped in real terms limiting somewhat the growth in the share of value-added attributed to this sector.

¹⁶ It is assumed that countries are providing these data inclusive of estimates of non-monetary agriculture sector activities, whether explicitly noted or not.

¹⁷ Early studies include A.R.Prest "The Taxable Capacity of a Country" in Toye J.F. (ed), *Taxation and Economic Development*, London, 1979; Richard Goode, *Government Finance in Developing Countries*, Brookings Institution, Washington DC (1984), Chap 4.

revenue performance differ across “similar” or comparable countries. For example, explanatory models for countries in different income groups can be estimated. Based on such models and the actual values of the explanatory variables or structural characteristics for a particular country, the tax capacity of the country is estimated. For example, if a country has a large agricultural sector composed largely of poorly educated small holders, then the estimated tax capacity for that country would be lower than comparator countries with relatively smaller agricultural sectors with larger farm sizes and more educated farmers. The next step is to compare the actual revenues collected in the country with its estimated tax capacity. This allows the estimation of “tax effort,” which is defined as the ratio of the actual tax to the tax capacity of the country. If the tax effort is less than one, for example, then there would appear to room for the country to increase its actual taxes to raise it up to or above its capacity.

A further use of this tax capacity analysis for countries is to be able to explain and forecast the impacts of structural changes in a country on its revenue performance of the country as it grows and develops. Future revenue performance depends not only on strengthening tax administration and compliance efficiency and tax policy, but also on the evolving structural changes in the economy that change the effective tax bases available.

In this study, both tax and revenue capacities and efforts for countries are estimated. Revenues include both tax and non-tax revenues which is relevant to the issue of domestic resource mobilization. In addition, two approaches are taken in the estimation of tax and revenue capacity. First, a “basic” estimate is made by including only the available structural variables explaining revenue performance, and second, an estimate is made that includes indicators of the tax policy choices of a country. The latter estimate helps deal with the interpretation issues that arise with tax effort estimates based only on structural variables. For example, if a country has a low tax effort, but is already imposing high tax rates on broadly defined tax bases, then the option of mobilizing revenues by raising tax rates is limited and may even be not recommended, but if the tax rates are relatively low, then tax rate increases could well be a revenue productive approach. If the tax indicators are already included in the model, then the meaning of a tax effort estimate is clearer.

Unfortunately, as noted above, the national statistics in low income countries are generally weaker and hence, limit the ability to obtain strong tax capacity estimates. The availability of tax policy indicators such as key tax rates, can often be even more limited than the economic structure statistics, especially among low income countries. These data issues are discussed in more detail in the next sections. The other key poorly reported tax policy choice is the size and composition of tax expenditures across countries which can lead to otherwise unexplained changes within and between countries in their tax revenue performances. This important issue is covered in Section 8.

Section 4: Data coverage of revenue and explanatory variables used in the study

4.1 Introduction

This section provides an overview of the sources, coverage and constraints of the data on revenue and explanatory variables used in the study. We have constructed a database using data on 214 countries covering a period from 1975 to 2016 or the latest year for which data is available. Data series has been extracted from a number of international and well-established data sources in our study. The scope, source and limitations along with adjustments made to the data are discussed below and in Annex 2 of this report.

4.2 Country coverage

While the goal in this cross-country comparison of revenue performance is to be as inclusive as possible of all 216 countries in the world, some country types were excluded. As discussed in Annex 2, 46 small islands and countries were excluded as not being representative of the more typical developing and emerging economy as well as generally suffering from weak national and fiscal statistics as can be seen in Table A 2.1 and Table A 2.2. This results in a loss of about 0.5% of the world population and 0.4% of the world GDP. The other country group excluded are the eight countries with oil revenue dominated economies, which typically have high domestic revenues composed largely on non-tax revenue. These countries are not representative of the problems that most countries face in domestic revenue mobilization, in general, or by enhanced tax revenue, in particular.

Table A 2.3 shows the aggregate availability of tax and non-tax revenue for the analysis of tax capacity and effort. In total, the study database has revenue data for 155 countries for 4,347 country-years of observations or about 28 years per country. Given countries move between income classes over the study period, many countries appear in more than one income class in different years so that the sum of the countries across income classes comes to 252 which implies that on average the period per country in an income class is about 17 years. As will become evident over the course of this study, the actually amount of usable observations starts to fall, often markedly, as more and larger sets of explanatory variables are sought to align with the country-years of revenue-to-GDP data. Unfortunately, this data loss tends to be highest among the lower income countries where data availability is weakest.

4.3 Revenue variables

For our study, we have focused on tax plus social security contributions (SSC) as the main tax revenue variable. SSC is defined in similar ways by the International Monetary Fund (IMF)¹⁸ and the OECD.¹⁹ SSC can be considered as a form of compulsory tax which can be used to both finance future welfare benefits

¹⁸ International Monetary Fund (2014) Government Finance Statistics Manual 2014 defines social security contributions as “actual revenue receivable by social security schemes organized and operated by government units, for the benefit of the contributors to the scheme. These contributions are classified by the source of the contribution, which may be the employers or the household sector (separated according to whether they are employees, self-employed, or unemployed).” <https://www.imf.org/external/Pubs/FT/GFS/Manual/2014/gfsfinal.pdf>

¹⁹ OECD (2018), Social security contributions (indicator). doi: 10.1787/3ebfe901-en (Accessed on 01 June 2018) defines SSC as “compulsory payments paid to general government that confer entitlement to receive a (contingent) future social benefit.”

of employees, and help to redistribute resources through investments in crucial public services. SSC is a major revenue source for governments particularly across OECD countries and continental Europe. It accounts for a fourth of the total tax revenue and average 36% of social expenditures in OECD countries.²⁰ SSC forms a much smaller share of revenues in most lower income countries due to underdeveloped labor markets and revenue institutions. Section 5 gives details of revenue composition and trends for various country groups.

The data on revenue variables for our study has been extracted from the General Revenue Dataset (GRD),²¹ which is developed by the ICTD at the University of Sussex. The GRD uses various international sources of data to create a comprehensive government revenue database. A major strength of the GRD is that it includes the best data from each country that has been collected from the following sources:

- OECD Revenue Statistics
- OECD Latin American Tax Statistics
- IMF Government Finance Statistics (GFS)
- IMF Article IV Staff Reports
- CEPALSTAT Revenue Statistics in Latin America

The key features of the ICTD database are the long time series data covering a period from 1970 to 2014, the availability of both central and general government revenue data in most cases, and a breakdown of revenues by various sub-categories (including tax and non-tax revenues, resource tax and non-tax revenues, grants, direct and indirect taxes, and social security contributions.) It also provides notes on key problems and potentially unreliable data that helps the user filter the dataset and make adequate modifications. The methodology behind the construction of the database is provided in detail in an ICTD working paper.²² The paper also acknowledges underlying issues with the data such as weak national data collection processes, and underlying issues with GDP rebasing.

While working with the ICTD data, we noticed issues such as mixing up of general revenue and central revenue data, discontinuous and missing data, inconsistent data for certain countries and years. Data was missing for many countries in the periods before 1980 and after 2012. In many cases, it was seen that the total tax revenue including social security contributions did not add up to the sum of total tax, social security contributions, and non-tax revenues. For some countries, the data on central and general government revenues has been transposed in the dataset. For example, general tax revenues in Mexico are usually around 17%, which is listed under the central government dataset. For all countries with both central and general data on taxes excluding social security contributions, we found 200 observations where the central government data is greater than or equal to the general government data. Based on some of these discrepancies, we have dropped or made adjustments to the GRD variables which are listed in Annex Table A 2.4.

²⁰ Goudswaard, K., & Caminada, K. (2015). "Social security contributions: Economic and public finance considerations," *International Social Security Review*, 68(4), 25-45.

²¹ International Center for Tax and Development Government Revenue Dataset <http://www.ictd.ac/dataset/grd/>

²² Prichard, W., Cobham, A., & Goodall, A. (2014), "The ICTD government revenue dataset," ICTD Working paper 19, Sept 2014. https://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/10250/ICTD_WP19.pdf and Wilson Prichard, "Reassessing Tax and Development Research: A New Dataset, New Findings, and Lessons for Research," *World Development* Vol. 80, pp. 48-60, 2016

As noted in Annex 2, the revenue data used for any country and year was the general government data wherever available given public service delivery depends on the total resources available at all levels of government in a country. Otherwise, the central government data was used. A dummy variable was added to the merged database so that the impact of missing subnational data could be estimated in regression models and when comparing group average revenue performances. Generally, as shown in Table 5.4, for countries with both general and central government revenues, for HICs central governments only collect 64.4% of revenues compared to 84.4% for LICs. Fortunately, for HICs 93% of observations have general government data, whereas only 24% of LICs have general government revenues but these LICs are only missing about 16% of revenues from subnational governments. As a result, on average about 2% of GDP is missing in all groups of countries. These corrections are discussed in the Section 5 below.

Ideally, some further refinements and additions to the revenue measures would be desirable. One would be information whether the governments of a country paid all indirect taxes on purchases of goods and services (other than where there are tax-free agreements for official aid financed purchases). Most governments pay their own taxes on their imports and purchases from domestic suppliers. Where a government gives itself tax-free privileges, this could significantly affect its reported revenue collections compared to a taxable government. For example, government purchases of potentially taxable items amounted to 10% of GDP at an average tax rate of 15%, this would amount to a 1.5% of GDP difference in reported tax collections that affects cross-country tax performance comparisons.

Another useful indicator would be the ability of a government to suppress the price of its purchases that can be regarded as an effective tax on the supplier. The most common such phenomenon is interest rate suppression by which a government can reduce its cost of borrowing at the expense of private savers. This can occur where governments require pension and long-term insurance funds to hold a minimum share of their funds in government bonds and in some instances prescribes an interest rate below the market interest rate. For example, if a government has 50% of GDP in debt that it manages to pay one percentage point lower on average than the market interest rate, then that represents a hidden tax of 0.5% of GDP.

A positive feature of the ICTD GRD is that efforts were made to ensure that where a country rebased its GDP data that the rebasing was extended back historically and not confined to current years only. While the GRD typically uses IMF World Economic Outlook (WEO) GDP data, there can nevertheless be concerns with GDP estimates. One concern is the alignment of fiscal year data with calendar year data. Fortunately, for some 73% of the countries in the GRD, their fiscal year is the calendar year. However, this leaves some 15% with a March 31 year-end (such as India, South African, Namibia and Botswana), 9% with a June 30 year-end (such as Egypt, Ethiopia, Kenya, Tanzania and Uganda), and 4% with a September 30 year end (such as the US). By WDI convention, countries with fiscal years ending in the first half of the year are reported in the year of the beginning of their fiscal year, while countries with fiscal years ending in the second half of the year are reported in the year of the end of their fiscal year. The other issue is whether revenues period matches the GDP period. This is most problematic for countries with June 30 year ends and without good quarterly national accounts. In these cases either the fiscal year revenues have to be divided by an average of the two successive calendar year GDPs, or alternatively an average of revenues from two successive fiscal years have to be divided by the calendar year GDP. The IMF WEO chooses the later approach for some countries (Kenya, Tanzania and Uganda, for example), but the former for Ethiopia. Typically, for budgeting purposes, countries would tend to use the former approach of dividing actual fiscal year revenues by an average GDP estimate. But from the perspective of aligning the revenue-to-GDP ratio with other explanatory variables reported for a calendar year, the estimated average revenues in the calendar year is preferable. In other cases, as well for March 30 fiscal year ending countries, different

approaches to dealing with matching are observed. For example, IMF WEO data reports fiscal and GDP data for India on a fiscal year basis, but on a calendar year basis for South Africa. Clearly, where the fiscal and calendar year data are not aligned or only aligned by averaging, then errors arise in the revenue-to-GDP ratio. In the time available to conduct this study, the issue of identifying which approaches to aligning fiscal to GDP data were applied in the ICTD GRD has not been possible.

Another GDP-measurement concern in this cross-country comparison of tax capacity and effort, is the issue of what parts of the Non-Observed Economy are included in the GDP estimate of a country.²³ Importantly, if production of households for own use (typically subsistence farming and own construction of buildings with non-market materials) are included and are a substantial share of GDP in a country, then from a monetary tax collection perspective, the revenue-to-GDP ratio is understated. If they are excluded, then the GDP per capita is understated for the taxpaying portion of the population that are mainly in the monetary sector. Again, this information on the extent of any inclusion of non-market production in GDP estimates by country is not readily available.

4.4 Explanatory variables

We have used a wide range of variables that factor into the tax and revenue performance of a country. Most data on explanatory variables have been collected from international databases such as the World Bank World Development Indicators, UN Statistics, and International Monetary Fund Economic Outlook and Government Finance Statistics. The historical and geographical coverage of the data on explanatory variables is limited by the coverage of the key data sources. Data on some or similar important explanatory variables may be available for some countries in their national statistical reports for some years, but it has not been collected in an international database. The definitions of the various explanatory variables, along with their source and list of adjustments, if any, are available in Annex Table A 2.4.

The variables used in our study represent constraints, opportunities and policy choices that impact tax performance and can be classified under the following main categories- macroeconomic indicators, economic structure, type or level of government, revenue and tax policy, taxpayer compliance capacity and tax administration capacity:

- **Macroeconomic indicators**

For each year of available data, countries are classified into the income class (low, lower middle, upper middle and high-income country or LIC, LMIC, UMIC and HIC) according to the World Bank Analytical Classification of the country. This income class classification is used extensively in making cross-country comparisons within and between groups. This is important where it is expected that the impact of explanatory variables on country tax capacity is different within different income classes. This is expected to be the case for a number of variables such as GDP per capita, share of goods imports in GDP and share of agricultural value added in GDP, for example.

The core indicator is typically the level of income of a country, typically captured by the **real GDP per capita**, which is both an indicator of capacity to pay tax as well as related economic structures that facilitate revenue collections. Generally, as long as public sector services are a “luxury” good

²³ OECD, *Measuring the Non-Observed Economy: A Handbook*, 2002

and or revenues are constrained by the economic structure of an economy, it is expected that increases in GDP per capita lead to increases in the share of revenues out of GDP. If public services become an unconstrained normal or inferior good, then revenue over GDP ratios can be expected to stay flat or even decline with GDP per capita growth.

Using revenue-to-GDP ratios to measure revenue performance makes the assumption that GDP is the correct measure of the potential size of the tax base. This measure, however, excludes the net primary income (or net factor receipts) for labor and capital services and net secondary income (or net transfers) arising mainly from remittances and aid flows. When these two components are added to GDP gives the Gross National Disposable Income (GNDI) of the economy, which is the aggregate out of which an economy can consume or save. Hence, for example, if the GNDI exceeds the GDP by a large margin, then there is an expectation that at least the demand-side based indirect taxes on imports and domestic demand would be higher than expected from the GDP measure. For some countries this turns out to be the case. For example, analysis of the tax capacity of the 13 country members of the Southern African Development Community over 1990-2001 showed that for each 1% of excess of GNDI over GDP is related to 0.2% increase in taxes over GDP.²⁴ When a wider country group is compared, however, the same consistent positive relationship only appears for some groups of countries. For example, in a study of the tax capacity of 123 countries over 1975-2000, then a positive impact of higher GNDI/GDP was only found for LICs.²⁵ More careful consideration of the tax treatment of the different component flows would indicate that the aggregate effect of net primary and secondary incomes may depend on the components in a specific country. For example, primary income inflows may escape taxation by a territorial tax that exempts foreign source income, whereas primary income outflows could generate significant tax if they are subject to substantial non-resident withholding taxes. The composition of secondary income may also matter, while official aid inflows typically are tax exempt, remittances to households typically boost expenditures and related indirect taxes. In this study three variables will be examined, **GNDI/GDP, net primary income/GDP and net secondary income/GDP**. With more detailed data, the effects of exempt foreign source income, taxed primary outflows, official aid inflows and remittances could be separately examined.

The taxpaying population is largely concentrated in the working age population (ages 15 through 65 years) rather than the dependent share of the population. Therefore, the GDP per capita is lowered if there is large population growth especially where it builds up the young dependent population. To control for the age structure of the population, therefore, the **working age (15-65 year old) population as a share of the total population** should indicate a higher tax-to-GDP ratio for a given GDP per capita.

For many economies, the world price of tradable commodities is a key indicator of the profit margins available to producers of these commodities. Corporate profits have been found to be very sensitive to the real producer prices.²⁶ Accordingly, a number of variables are included in

²⁴ Graham Glenday, "Assessment of the Current State of VAT Implementation in SADC Member States" Report prepared for the Trade, Industry, Finance and Investment (TIFI) Directorate of the Southern African Development Community, August 15, 2004, revised November 30, 2005, Chapter 6, "Tax Capacity and Efficiency."

²⁵ Graham Glenday (2006), "Towards fiscally feasible and efficient trade liberalization," study prepared under the Fiscal Reform in Support of Trade Liberalization Project, DAI/USAID, May 18, 2006, Annex E, "Estimations of tax capacity."

²⁶ See for example, Graham Glenday, "South African Tax Performance: Some Perspectives and International Comparisons," paper

addition to the **inflation rate of consumer prices**. The two key indicators are the **world non-energy commodity price index** based on real US dollar 2010 prices with 2010=100, and the **purchasing power parity (PPP) real exchange index** of the local currency units (LCU) per US dollar with 2010 =100. The real domestic producer prices are affected by both the change in real world commodity prices and the real exchange rate.

- **Economic structure**

These are grouped into two types of indicators:

Tax handle indicators

Some economic structures in a country are indicators of good “tax handles” or tax bases that are relatively easy to identify, control and assess. Customs collection from goods imports in well-controlled air, rail land and seaports has long been a key tax collection point in developing economies. Hence, the value of **merchandise goods imports as a share of GDP** is expected to be a significant predictor of tax capacity especially among LIC and LMICs, but it becomes of negligible importance among HICs as average tariff rates have been dramatically reduced among HIC in particular. In a study of tax capacity of 123 countries over 1975-2000, Glenday (2006) found that a one percentage point increase in the goods import share to an increase in 0.2 percentage points in tax to GDP among LICs and 0.15 among LMICs, but was insignificant among HICs. Some studies use the total trade to GDP ratio as a determinant of tax capacity, but the logic of this argument has to go through higher trade shares being related to higher GDP rather than greater technical efficiency in tax collection. Total trade includes imported service and exports of goods and services to the goods import share. Imported services are difficult to tax and typically, exports are exempted from indirect taxes.

A large mining sector is commonly taken as a good tax handle. One standard measure of the importance of the mining sector in an economy is **mining value added as a share of GDP**. Other measures are based on the importance of natural resource exports. These are often measured as **fuel exports and as ore and metal exports each as a share of merchandise exports** or as the combined value of these **natural resource exports as a share of GDP**. In practice, whether a large mining sector promotes high tax capacity depends upon the modalities of a country collecting resource rents. If a large share is collected through non-taxes, then a higher mining value added could indicate a lower tax capacity, but a higher revenue capacity. If taxation is the main mechanism for collecting a share of the resource rents, then a large mining sector is expected to indicate a high tax capacity. In either case, a large mining sector is expected to indicate a high domestic revenue capacity.

Another potential tax handle in an economy is the tourism sector where hotels, restaurants, shops, entertainment and transportation companies may be larger corporate entities amenable to taxation. Measures of the relative size of the tourism sector included in this study are **inbound tourism expenditures and inbound tourism travel revenue each as a share of GDP**. Unfortunately,

tourism as a tax handle is expected to be more important in island and other small economies that are largely excluded from this study of tax capacity.

A key tax handle as an economy develops is the growth of formal employment in the corporate and government sectors. In HICs, the taxation of employment income through the personal income tax and social security contributions has become a major component of most HIC tax revenues. This is clearly facilitated by the ability to have employers deduct income taxes and social security contributions on a regular basis from the periodic payments to employees. Other employees are employed in various forms of unincorporated businesses, including self-employment. While some of this business activity may be conducted in a formal manner, much of this is informal employment and such business activity is typically hard to tax. To capture the relative size of formal employment for comparisons within and between country groups, two indicators are included in the study, namely, **compensation of employees as a share of GDP** from national accounts, where available, and the **paid labor force as a share of the working age (15-64 years) population** where available from labor force statistics. Unfortunately, these two key indicators have weak reporting in most low income countries.

- **Hard to tax or informal sector indicators**

A key structural feature of an economy in terms of causing difficulties in tax administration is the relative size of the informal sector. Ideally, detailed labor force statistics and earnings data would reveal the composition and size of employment and business activity in the rural and urban informal sectors. Typically, in LICs and LMICs in particular, this data is weak or non-existent. Aside from unincorporated small and micro-businesses, the informal sector would contain criminal, underground and subsistence activities. Importantly, in some LICs significant parts of the agricultural sector could include subsistence farming and housing construction. Two indicators of the relative importance of the informal sector used are, first, the **agricultural sector value added as a share of GDP** and, second, the **rural population as a share of the total population**. Both of these indicators suffer from the weakness that they miss out the indicating the relative importance of the urban informal sector which can be large in many MICs. Ideally, in the national accounts there should be a measure of the mixed income in an economy (the value added earned by various unincorporated business activities) and a detailed breakdown of the labor force by rural and urban sectors.

In studying the impact of the agricultural share in the economy, it is expected that a higher share is related to a lower tax capacity especially among LICs and LMICs where the agricultural sector is likely dominated by small holder farmers. In HICs, by contrast, with more large scale, corporate farmers, who producing more cash crops and are capable of complying with self-assessed, the negative impact on tax capacity of a larger agricultural sector is not expected. Most prior tax capacity studies for LICs and LMICs show that a one-percentage point increase in the agricultural sector lowers the tax capacity by about 0.2 to 0.3 percentage points.²⁷

²⁷ Glenday (2006) estimated -0.2 for LICs and -0.12 for LMICs; Glenday (2005) estimated -0.3 for the countries in the Southern African Development Community based on 1990-2001 data; Katusiime (2003) estimated a coefficient of -0.2 for East African countries over 1991-98; and Stotsky et al (1997) estimated -0.17 for Sub-Saharan African countries over 1990-95. Katusiime, Frank M. "Measuring Tax Performance among East African Countries" URA Fiscal Bulletin, Vol 2 (no 1) June 2003, pp 1-50. Janet G. Stotsky and Aseggedech WoldeMariam, "Tax Effort in Sub-Saharan Africa" IMF Working Paper (WP/97/107) September 1997.

A more general approach to estimating the size of the difficult to tax sector (undocumented business activity, criminal and underground economic activity, cash-based undeclared business, etc.) is to estimate the value of the **shadow economy as a share of GDP**. The most common approach is to estimate the shadow economy indirectly from the apparent excess money (unaccounted for money) relative to formal estimates of the GDP. Estimates have now been made for a wide range of countries (137 different countries) and number of years (about 8 years on average), but still the number of observation years for LICs and MICs is relative small and more limited to recent years.²⁸ The other limitation from a tax administration and compliance policy perspective is that the measure does not identify closely the sources or causes of the shadow economy, which need to be addressed in the context of revenue enhancement.

Level/type of government

In order to study whether the government structure has an impact on fiscal performance of a country, dummy variable was included for countries with **federal government** arrangements. In addition, a dummy variable identifies **general government revenue** from **central government revenues** to control for the impact of missing subnational government revenue for some country-year data.

Revenue and tax policy

Revenues of a government are broadly divided into domestic revenues from non-tax revenues and tax revenues and grants, typically received from external resources. Since raising tax revenues usually has the largest technical, political and economic efficiency costs, if a country has access to significant low-cost non-tax revenues (such as natural resource rents) and stable flows of foreign aid grants, it is expected that these revenue flows would substitute for and reduce the tax effort of the country for a share of these revenues. Accordingly, these variables enter the explanation of government revenue performance: grants could impact both the estimation of taxes and domestic revenue, whereas non-tax revenues only impact the estimation of tax revenue as they become part of domestic revenue.

Two measure of grants are used in this study: **grants** as a share of GDP as reported in revenues of the recipient country government, and **net grants** as a share of GDP as reported commitments by donor countries that are members of the OECD DAC. Interestingly the net grants for the LICs and MICs in this study averaged 4.5% of GDP whereas as the grants reflected in recipient government accounts averaged only 1.3% of GDP. Even though technical assistance expenditures are excluded from net grants, these figures include grant administration costs and amounts paid for directly by the donor country such as emergency and food aid. Not all grant aid is actually disbursed through the recipient government budget. Another difference is the recipient government may receive grant aid from DAC non-member countries. Neither measure is "perfect" as an explanatory measure of the impact of grants on tax and domestic revenue efforts. Both exclude for example the grant-equivalent contained in the concessional loans to a government. In practice, the actual grants received tend to have the stronger explanatory power of tax and revenue capacity.

²⁸ Schneider, F., Buehn, A., & Montenegro, C. E. (2010). "New estimates for the shadow economies all over the world." *International Economic Journal*, 24(4), 443-461.

Development assistance has a complex relationship with the fiscal choices of the recipient government. A key characteristic of any revenue source is its stability over time. Governments for the most part need stable revenues to fund ongoing public services. Unstable revenues, such as commodity-based revenues, often need stabilization funds to help smooth out the flow of funds to support government program delivery. Aid flows tend to be volatile,²⁹ and hence, recipient governments can tend to respond with a range of strategies. Temporary or unstable flows could be used to write off debt to effectively stabilize the flow. The stable component of aid flows could be used to expand service delivery, but even then, there is the risk of aid cutbacks so that a rational precaution is for the recipient country to reduce its revenue effort and leave some of its revenue capacity in reserve to be able to replace any forgone aid flows. One channel for revenue cutbacks are the use of discretionary tax expenditures. Another is reduced pressure on politically sensitive taxpayers such as state owned enterprise to keep their tax payments current. Studies of the impact of grants on tax performance such as the 13 Southern African Development Community (SADC) member governments over 1990-2001 have shown that taxes are reduced by 20% to 50% per dollar of aid. This result will depend greatly on the mix of countries in any study and the mix of donor behavior as well. For example, if donor countries distributed higher levels of aid to better performing LICs (growing and developing faster and good revenue effort), it could appear that higher aid was associated with higher revenue efforts even if these revenue efforts were somewhat suppressed.

Non-tax revenues (as a share of GDP) is used a determinant of tax choices and performance of a country. If a country has access to high non-tax yields such as with oil and other mineral rich countries, then lower tax revenues are required to fund any target level of public services. In this study, for example, the oil-revenue-dominated countries that collect relatively little in taxes were dropped given the extreme level of non-tax revenue substitution for tax revenue. Tax capacity studies tend to find non-tax revenues partially substituting for tax revenues. For example, in the SADC study non-tax revenue substituted for 29% to 55% of tax revenues and another study of East African economies showed a 32% reduction.³⁰ In the SADC country study the combined effect of grants and non-tax revenues was a 15% to 50% reduction in tax revenue per dollar.

Tax policy choices are primarily reflected in the tax rates set on the major tax bases of a country. Given many of the tax structures are complex key indicator rates have to be chosen to represent the tax rate structure except for the case of import tariffs where trade weighted rates are available. The other major tax policy issue affecting tax performance are the **tax expenditures** implemented by countries through provisions in the tax laws. To date there is not sufficient information available on a consistent basis across countries and over time to include them as explanatory variables of country tax performance. Tax expenditure issues and estimates are covered in detail later in section 8.

²⁹ Buliř, Alěš and Javier Hamann, 2003, "Aid Volatility: an Empirical Assessment," IMF Staff Papers, Vol. 50 (April), pp. 64–89. Benn Eifert and Alan Gelb, "Improving the Dynamics of Aid: Towards More Predictable Budget Support," World Bank Policy Research Working Paper 3732, October 2005

³⁰ Katusiime, Frank M. "Measuring Tax Performance among East African Countries" URA Fiscal Bulletin, Vol 2 (no 1) June 2003, pp 1-50

The **trade weighted applied import tariff rate** is used in this study to capture the tariffs charged on imported goods. While this measure has some attractive features in that it is a comprehensive measure of the average tariff rate, it has some shortcomings. The main one relates to the fact that two countries can have the same average tariff rate, but display different revenue performance because of the dispersion of tariff rates across types of imports. A tariff schedule with high tariffs on selected final goods by low or no tariffs on intermediates, raw materials and capital goods is typically expected to yield lower revenues than a uniform tariff structure because the tariff rate differentials and trade protection cause a major narrowing of the taxable base. Ideally, a measure of the dispersion of the tariff rates should also be included to capture revenue impacts of the tariff rate structure.

The major sources of domestic tax are typically some Goods and Services Tax (GST) or VAT on domestic consumption and the income tax, which can be broken out in to the corporate income tax (CIT) and the personal income tax (PIT). Ideally, the excise taxes and social security contributions should also be included in a set of domestic tax rate indicators, but often these have complex (possibly unit) tax structures and do not have widely published rates. Hence, the GST/VAT, CIT and PIT are used to develop domestic tax rate indicators. The **GST/VAT standard or regular rate**, the **standard CIT rate** and the **top marginal PIT rate** were used separately and combined into weighted domestic tax indicators. Tax rate data was gained from OECD, CEPAL, KPMG and research into rates of individual countries.

Two domestic tax rate indicators were constructed combining the income tax and GST/VAT tax rates for each country and year, where data was available, as follows:

Domestic tax rate indicator 1

$$= (\text{CIT rate} + \text{PIT rate}) / (1 + \text{VAT/GST rate}/100) + \text{VAT/GST rate} * (1 - (0.5 * \text{CIT rate}/100 + 0.5 * \text{PIT rate}/100))$$

Domestic tax rate indicator 2

$$= (\text{CIT rate} + \text{PIT rate}) / (1 + \text{VAT/GST rate}/100) / 2 + \text{VAT/GST rate} * (1 - (0.5 * \text{CIT rate}/100 + 0.5 * \text{PIT rate}/100))$$

Domestic tax indicator 1 puts equal weight on the three rates, but Domestic tax indicator 2 halves the income tax rates to put equal weight on the income tax rates and the consumption tax rates, which is a better reflection of the relative importance of consumption taxes in LICs and MICs. In both indicators, there are weight corrections to reflect the reality that direct and indirect taxes are competing for tax base space in an economy. When the VAT/GST rate is raised then the value added at factor prices (which is the base for direct taxes) is reduced and accordingly the direct tax rates are divided by $(1 + \text{VAT/GST rate}/100)$. Similarly, the direct taxes reduce the disposable income left for market purchases, which forms the base for indirect taxes so that the VAT/GST rate is weighted by $(1 - \text{average CIT and PIT rates})$. For example, in countries with low VAT/GST rates (Asian economies tend to have 10% VAT/GST rates compared to around 20% in many European economies) more tax base room is left for the income tax and so a higher weight is put on the income tax rates. In the estimations of country tax capacities, these two domestic tax rate indicators are tested and compared with entering the tax rates separately to seek the best fit in explaining tax performance within the countries in different income classes.

Taxpayer compliance capacity

The effective and efficient administration of any tax, self-assessed taxes in particular, require adequate capacity among taxpayers to comply with the provisions of the tax. At a minimum, this requires high levels of general education such as literacy and numeracy as well as specific skills relevant to tax compliance, which can range from bookkeeping to accountancy, IT skills and knowledge and understanding of tax laws and compliance requirements. Given that tax accountants and other tax professionals are on the front line of tax compliance of business entities, an adequate supply of such skills enhances the possibility of tax compliance. Unfortunately, higher specific level educational and skill level attainment data are not commonly available, and even cross-country data on basic educational attainment is often not available for all countries for all age groups or all years.

This study limits itself to basic indicators of general skill capacity and educational attainment. The **adult (15 years plus) literacy rate**, **adult (25 years plus) primary completion rates** and **share of adult population (25 years plus) with no schooling** are used as indicators of basic general skills (or lack of such) among the adult population who are expected to provide the taxpayer. The **primary education completion rate** of the current school-age population gives a measure of the potential level of general education skills amongst the future taxpayers. It is of interest for a country with adult low literacy and low adult primary completion rates (or high shares of the adult population with no schooling) to be able to anticipate improvements in these indicators if it has high current primary completion rates. As an indicator of the availability of professionals and skilled workers among taxpayers, the **share of the adult population (25 years plus) with post-secondary education** is gathered for countries and years where it is available.³¹ Given many countries have only occasional educational attainment statistics, estimates were made for the gap years starting from 1999 using estimated trends in the variable for a country.

Governance and tax administration capacity

In recent years, the OECD has been collecting information on the structure, functions and performance of tax administrations of OECD member countries and some other economies.³² But there is still a lack of either a comprehensive index of the capacity and efficiency of tax administrations across a broad spectrum of countries or even of many the key component indicators that would go into such an index. Ideally, some the measure of tax gaps discussed in Section 3 would be covered. These could include the collection efficiency of self-assessed taxes (Tax Gap 4 in Section 3 above), the ratio of tax arrears to tax collections (including key information such as the share of these arrears arising with state owned enterprises), the ratio of unpaid refunds to the total assessed refundable amounts (part of Tax Gap 5) and reassessment and adjustments of tax as a share of tax collections (Gap 6.) Effective coverage of the taxes could be indicated by ratios employed taxpayers to total employment and registered business taxpayers (other than corporations) as a share of the labor force working in unincorporated business activities. Capacity measures could include measures of tax professional staffing relative to the number of registered taxpayers and indicators of ITC capacity and usage. While some information on the costs of tax administration per unit of taxes collected are available, these are often undermined by partial data

³¹ Adult education attainment data comes from *UNESCO Institute for Statistics*.

³² See for example, OECD, *Tax Administration 2017: Comparative information on OECD and other advanced and emerging economies*, 2017

where there are multiple administrations involved in collecting different revenue types or at different levels of government. For cross-country comparisons, it would also be useful to adjust or standardize unit collection costs for (a) the economies of scale available in tax collection as country size grows, (b) tax rate indicators, (c) coverage of revenue types or streams to allow better comparison of country performance by size and level of development.

In recent years, the Tax Administration Diagnostic Assessment Tool (TADAT) has been developed to conduct assessments of tax administration systems in countries.³³ Through June 2018, 58 country assessments have been conducted, but so far, only 12 country assessment reports are publicly available.³⁴ Hence, due to the lack of any specific cross-country tax administration performance or capacity index or indicator data, we have used **governance indicators** to capture quality of governance and tax administration in countries. While the World Bank World Governance Indicators (WGI) are widely used, all WGI indicators were found to be highly correlated to each other as shown in Annex 4, Table A 4.11. Instead, we have used the **International Country Risk Guide (ICRG) Researchers' Dataset** on political risks, which covers more than 140 countries over 30 years. The **political risk indicators** cover 12 sub-indicators (**Government Stability, Socioeconomic Conditions, Investment Profile, Internal Conflict, External Conflict, Corruption, Military in Politics, Religion in Politics, Law and Order, Ethnic Tensions, Democratic Accountability, and Bureaucracy Quality**). Most of the sub-indicators capture important administrative, legal and bureaucratic qualities, which directly affects the tax administration quality of a country. Earlier studies had successfully used the Corruption and Bureaucratic Quality indicators as help explain country tax capacity.³⁵ We have constructed a normalized composite out of 100 combining the score of the various political risk sub-indicators. The normalized composite score formula is shown in Annex 4, Table A 4.9 and Table A 4.10.

³³ The International Monetary Fund, *Tax Administration Diagnostic Assessment Tool* (TADAT).

³⁴ For access to unpublished TADAT results, it is possible to apply to the TADAT secretariat to gain access to the results without country identifiers for research purposes, but that limits the usefulness in cross-country studies where the results need to be linked to other country data.

³⁵ Tuan Minh Le, Blanca Moreno-Dodson and Nihal Bayraktar, "Tax Capacity and Tax Effort: Extended Cross-Country Analysis from 1994 to 2009," World Bank, Policy Research Working Paper WPS 6252, October 2012.

Section 5: Trends in taxes and domestic revenues across income classes and regional groups of countries

5.1. Introduction

This section provides an overview of the differences in the broad revenue structure across groups for the overall sample of country observations. Groups of countries are classified here in terms of the income class, region and resource revenue dependence. It also gives an overview of the trends or stability in revenues over the decades from the pre 1990s to post 2010s covered by the available country observations. The trends in commodity prices over these periods are also discussed as a major factor affecting the tax capacity of countries. Overall, this section suggests the basis for the more detailed analysis of the differences in revenue performance that are covered in the following sections 6 and 7.

5.2. Group differences in revenue structure and performance

This section looks at the broad results in the average revenue performance within income classes and regions as well as resource revenue dependent countries. Table 5.1 gives the mean tax, non-tax and domestic revenues as shares of GDP for these country groups as well the standard deviations in these revenue measures within these groups. The standard deviations given a measure of the absolute variability of the revenue performance within the group and the standard deviation over the revenues gives the relative variability across member countries.

Table 5.1: Country group means and standard deviations (SD) of tax and non-tax revenues as shares of GDP for all sample years

Group	Tax ex SSC			Social Security Contributions (SSC)			Tax + SSC			Non-tax Revenue			Domestic Revenue		
	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean
LIC	11.9	6.1	51%	0.3	1.0	377%	12.2	6.3	52%	3.2	4.4	138%	15.4	7.6	49%
LMIC	17.8	7.8	44%	1.9	3.4	180%	20.3	9.2	45%	4.9	5.3	109%	25.2	9.6	38%
UMIC	19.2	6.1	32%	3.9	4.8	123%	24.4	8.7	36%	5.9	5.3	90%	30.3	9.2	30%
HIC	25.2	7.1	28%	6.3	5.6	89%	33.0	8.8	27%	6.9	3.4	49%	39.9	9.5	24%
Oil revenue dominated (RG1)	5.4	8.4	156%	0.0			5.4	8.4	156%	38.2	19.3	50%	43.6	17.4	40%
Resource Dependent Economies (RG2)	15.6	8.1	52%	0.8	2.1	273%	17.0	9.2	54%	6.4	7.3	115%	23.3	11.4	49%
South Asia	10.0	3.5	35%	0.0	0.1	305%	10.2	3.8	37%	4.0	4.5	112%	14.2	4.8	34%
Sub-Saharan Africa	14.9	9.0	60%	0.1	0.3	363%	14.9	8.9	60%	3.8	5.6	148%	18.7	11.2	60%
East & Southeast Asia	15.1	5.7	37%	0.9	2.3	255%	16.3	6.7	41%	4.2	2.9	68%	20.6	7.1	35%
Latin America	15.0	4.5	30%	1.6	2.3	143%	17.5	5.2	30%	3.5	2.4	70%	21.0	5.9	28%
Former USSR	19.6	5.2	27%	2.6	4.1	156%	26.1	8.0	31%	4.7	4.7	101%	30.7	9.7	32%
Eastern Europe	22.5	5.4	24%	5.3	5.9	111%	33.4	6.9	21%	4.7	2.3	48%	38.1	8.1	21%
Other Europe	26.5	6.8	26%	6.5	5.7	89%	35.3	7.8	22%	7.0	2.6	37%	42.3	8.7	21%
Residual group	20.5	9.4	46%	1.2	2.1	174%	22.4	10.0	45%	8.8	6.8	77%	31.2	9.2	30%
All (ex. RG1)	18.1	8.6	48%	2.1	4.1	191%	21.4	11.4	53%	5.0	5.0	99%	26.5	13.0	49%

The initial focus is on the revenue performance of countries by income group – LIC, LMIC, UMIC, and HIC. The domestic revenues for each group are broken out into tax revenues, SSC, taxes plus SSC, and non-tax revenue. It is noticeable that revenues over GDP increase in all revenue types (tax, SSC and non-tax) as a country moves up the income groups. Table 5.2 shows these increases by revenue type and in domestic revenues. SSC go from insignificant at 0.3% for LICs up to 6.3% of GDP for HICs. Both taxes and non-tax revenue about double as a share of GDP from the average LIC to average HIC. The most noticeable single increment is in taxes by 5.9% of GDP between the average LIC and LMIC. Overall, on average, domestic revenues increase by 9.8% of GDP from LIC to LMIC, 5.0% of GDP from LMIC to UMIC and 9.6% of GDP from UMIC to HIC with most of the increase coming from taxes plus SSC. When the increase in domestic revenue is related to the actual increases in the average per capita GDP between the income classes (see Table 5.3 for the GDP per capita in constant 2010 US\$ for the country groups), the increment of domestic revenue per \$1,000 increase in GDP per capita is 4.1% of GDP from LIC to LMIC, but drops to 0.9% of GDP per \$1,000 from LMIC to UMIC and further to 0.3% of GDP per \$1,000 from UMIC to HIC. This emphasizes the importance of GDP growth to increasing the domestic revenues among LICs. As noted in Section 2, there has been a massive upward mobility over the past two decades of LICs to LMICs and LMICs to UMICs and some into the HICs. This marks a major upward shift in the revenue capacity of these countries and their expected revenue performance. It also shows the important differences between the country groups in how they are responding to changes in the other structural factors that may be affecting or constraining their revenue performance. These factors will be emphasized in the more detailed analysis in sections 6 and 7.

Table 5.2: Revenue performance increments as shares of GDP (%) between country income classes

Change in income class	Tax ex SSC	SSC	Tax + SSC	Non-tax Revenue	Domestic Revenue
LIC to LMIC	5.9	1.6	8.1	1.7	9.8
LMIC to UMIC	1.5	2.0	4.0	1.0	5.0
UMIC to HIC	6.0	2.4	8.6	1.0	9.6

Table 5.3: Average GDP per capita in constant 2010 US\$ for country groups for all sample years

Country group	Mean	SD
Low income countries	742	447
Lower middle income countries	3,166	1,682
Upper middle income countries	8,856	3,511
High income countries	38,047	17,108
Oil revenue dominated (RG1)	36,138	20,169
Resource Dependent Economies (RG2)	5,204	10,788
South Asia	857	551
Sub-Saharan Africa	1,611	2,693
East & Southeast Asia	9,699	13,654
Latin America	5,313	3,176

Former USSR	4,689	4,280
Eastern Europe	8,721	5,630
Other Europe	38,023	18,174
Residual group	15,423	15,570
All (ex. RG1)	11,342	16,546

Second, there are other groups of countries that show significantly different patterns of revenue composition and performance. The first groups are based on the patterns and importance of natural resource exploitation. The most extreme group are labelled “oil revenue dominated” which are formed by a number of Gulf States plus Brunei and Libya. These eight countries have high per capita income and very high domestic revenues at 43.5 of GDP on average with 88% of this revenue coming from non-tax revenues, mainly from state-owned oil companies. They have no social security revenues and only average 5.4% of GDP in tax revenues. Another group of 50 mainly middle income countries that are labelled “resource dependent economies” with a combination of high export shares of fuels and minerals or high shares of mining valued in their economies also have a higher share of their domestic revenues at 27% on average coming from non-tax revenues. For all countries, excluding the oil revenue dominated economies, the average share of non-tax revenues is 19%.

The second country grouping of interest is a regional grouping to check whether there are significantly different patterns in revenue composition and performance across regions that may have arisen from a degree of shared experience in their socio-economic development and importantly in their views on the roles of the public sector in their economies.³⁶ In this study, nine regional groups are identified including a residual group of economies not in the other specific groups. The tax plus SSC and domestic revenue performances within each of these groups are significantly different from each other, except for Eastern Europe not being significantly from the other European countries despite the huge differences in their average per capita income as shown in Table 5.3. In part, this can be explained by the high use of social security contributions in Eastern Europe relative to its average income level.

The regional groups are listed in Table 5.1 in order of ascending domestic revenue performance. While this order generally matches the ranking of GDP per capita by region in Table 5.3, there are notable exceptions. South and South-East Asia shows lower domestic revenue performance compared to its income level, especially in its tax and social security contributions. By contrast, both economies of the Former USSR and Eastern Europe show much higher revenue performance than would be expected from their average income levels. This in section 6, the characteristics of these regions will be compared for significant differences, especially in tax policy choice, and section 7 checks whether membership in these groupings helps explain some of the differences in revenue performance.

One concern that was noted in the discussion of the data in Section 4 is the problem that general government tax and non-tax revenue is not available for all countries. This raises the question of what downward biases are in the group revenue performance estimates just noted and whether the errors are similar or different across the country income classes. Table 5.4 shows that for high income countries

³⁶ Some more refined regional groupings could have been used particularly for the large number of countries within Sub-Saharan Africa. This region displays a high relative variance in per capita GDP and in domestic revenue performance.

(HICs), general government revenue data is available in 93% of the country observations which is fortunate as in the case of HICs central government revenues only constitute 64.4% of the general government revenues on average. This contrasts with LICs where general government revenues are only available in 24% of the country observations, but for LICs, central government revenue forms 86.4% of revenues. These offsetting effects result in the scale up factors rising from 1.04 for HICs to 1.12 for LICs and even more stable adjustments if expressed as the increment of revenue over GDP that needs to be added to the average domestic revenue estimate. This increment only varies from 1.5% for HICs, to a high of 2.9% for LMICs. Hence, while the average domestic revenue performance should be raised compared to those given in Table 5.1, the gaps between the average domestic revenue performances between the income classes remains similar to what is expressed in Table 5.2.

Table 5.4: Scale-up factors for average revenues of average country in income groups based on all sample years

Income group of country	Share with general government revenues (%)	Central revenue over general government revenue (%)	Scale up factor for average country revenue	Increment to domestic revenue over GDP (%)
LIC	24.0	86.4	1.12	1.8
LMIC	46.8	82.0	1.12	2.9
UMIC	74.3	81.5	1.06	1.8
HIC	93.0	64.4	1.04	1.5

Table 5.5: Country group means and standard deviations (SD) of grants and total revenue as shares of GDP for all sample years

Group	Domestic Revenue (DR)			Grants			Total revenue (TR)			Grants over DR	Grants over TR
	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean		
LIC	15.4	7.6	49%	2.5	3.8	156%	18.0	8.8	49%	16.0%	13.7%
LMIC	25.2	9.6	38%	0.8	1.8	230%	25.8	9.8	38%	3.2%	3.1%
UMIC	30.3	9.2	30%	0.2	0.6	302%	30.7	9.2	30%	0.7%	0.7%
HIC	39.9	9.5	24%	0.1	0.7	547%	40.0	9.5	24%	0.3%	0.3%
Oil revenue dominated (RG1)	43.6	17.4	40%	0.2	1.2	809%	44.3	17.6	40%	0.4%	0.3%
Resource Dependent Economies (RG2)	23.3	11.4	49%	0.8	2.1	280%	23.9	11.3	47%	3.2%	3.2%
South Asia	14.2	4.8	34%	2.7	6.3	230%	16.9	9.6	56%	19.1%	16.1%
Sub-Saharan Africa	18.7	11.2	60%	1.7	3.0	181%	20.9	11.5	55%	8.9%	7.9%
East & Southeast Asia	20.6	7.1	35%	0.5	1.6	312%	20.7	7.3	35%	2.4%	2.4%
Latin America	21.0	5.9	28%	0.3	1.0	290%	21.6	5.8	27%	1.6%	1.6%
Former USSR	30.7	9.7	32%	0.3	0.8	262%	31.3	9.6	31%	1.0%	1.0%
Eastern Europe	38.1	8.1	21%	0.2	0.8	414%	38.1	8.0	21%	0.5%	0.5%
Other Europe	42.3	8.7	21%	0.0	0.2	945%	42.9	8.6	20%	0.0%	0.0%
Residual group	31.2	9.2	30%	0.7	2.1	284%	31.8	9.1	29%	2.3%	2.3%
All (ex. RG1)	26.5	13.0	49%	0.8	2.4	297%	27.0	12.6	47%	3.1%	3.0%

Table 5.5 expands the revenue position of governments to include the grants received in order to estimate the average total revenue in a group of countries. As expected, grants are concentrated among the LICs and LMICs. For LICs, grants formed 2.5% of GDP or 13.7% of total revenue (TR), and for LMICs, 0.8% of GDP and 3.1% of revenue. Interesting, the variability of grants within country groups is very high with the standard deviation (SD) exceeding the mean grants over GDP in all country groups. This means that for an aid-favored LIC, grants over GDP could exceed 6.3% of GDP and could well form more than 40% of a TR for a country with below average domestic revenue. In terms of regional groups of countries grants are important sources of revenue in South Asian and Sub-Saharan African countries at 2.7% and 1.7% of GDP on average, respectively.

5.3. Variability in domestic revenue performance within country groups

Another important observation from Table 5.1 is the relatively high variability of domestic revenue and its components expressed as the SD over the mean revenue performance. While the absolute variability or SD of tax, non-tax and domestic revenue tends to be fairly constant across income classes, the relative variability tends to fall as income levels rise. Exceptions are SSC where the SD rises sharply with income, and grants where the SD falls with rising income. Tax plus SSC variability drops from 52% for LICs to 27% for HICs and domestic revenues from 49% for LICs to 24% for HICs. It is also of interest to note that with the exception of Sub Saharan Africa, the variability within the regional groups of countries is less than the variability within all countries. This suggests that membership of a regional grouping should have some degree of explanatory power in explaining country revenue performance. For Sub Saharan African countries, however, some subgroups could be explored in future studies that identify more consistent revenue performance within these groups.

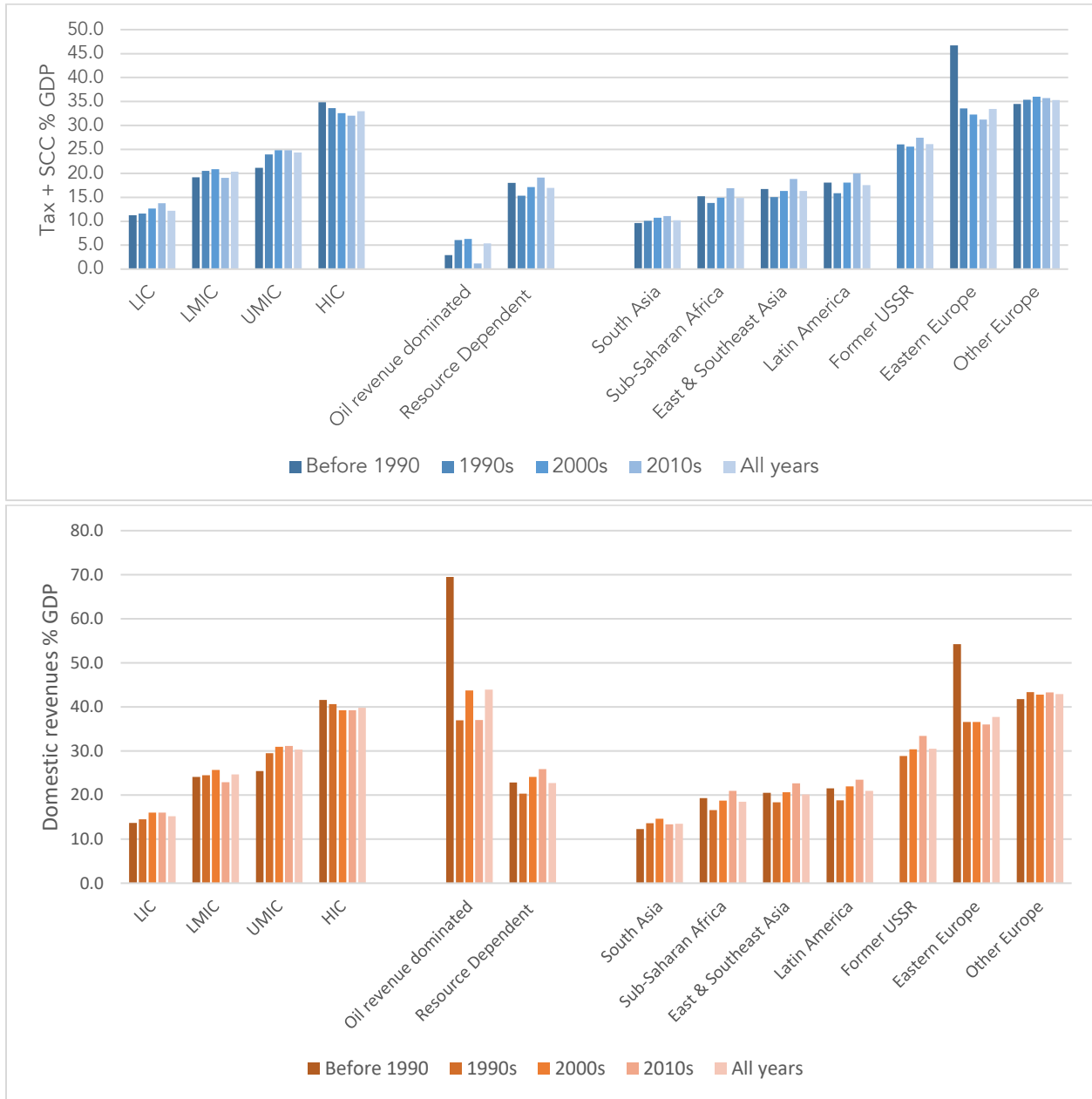
This relatively high variability in tax and domestic revenues raises the question of what explains the **variability of revenue performance within income classes of countries**. This motivates the models and results presented in Sections 6 and 7 where the roles of explanatory variables in explaining the variability in tax and revenue performance across countries within income groups. These explanatory variables include economic structural features that constrain or enable revenue collections as well as policy choices that affect revenue performance. One of the type of policy choice is the use of tax expenditures and their impact on tax revenues. Section 8.

5.4. Trends in revenue performance within country groups

While the discussion above shows that there are significant differences between the tax plus SSC and domestic revenues between country groups over the sample period which starts in the 1980s and stretches to the mid-2010s, but also shows significant variability within all groups. A basic starting question becomes whether this variability is arising from changing revenue performance over time especially within the countries in an income class?

Figure 5.1 shows the average tax plus SSC and domestic revenues as shares of GDP for the decades from 1980s through 2010s for country groups. With a few exceptions, visual analysis shows a pattern of remarkable stability in the average revenue performance within these groups. Some of the exceptions include increases in performance within the LICs and UMICs, but decreases within the HICs. It is unclear though whether these results are affected by the changing membership of countries in these groups over time as the number of LICs have declined while the number of UMICs and HICs have increased. The other country groups have more stable membership over time. The oil revenue dominated countries show a decline in domestic resources as a share of their GDPs, while the resource dependent economies show some increase in their domestic revenue performance. Amongst the country groups, South Asia, Sub Saharan Africa, East and South East Asia and Latin America all show some improvements in revenue performance.

Figure 5.1: Trends in average Tax plus Social Security Contributions and Domestic Revenues as shares of GDP by decade



To analyze the revenue performance trends more carefully, three other strategies were used. Both linear and quadratic time functions were estimated for the 25 income-class years available and the 34 country-group years available to check for any positive or negative trend lines and whether the performance tended to reach a peak (maximum) or trough (minimum) over these years and when these extremes were experienced. In addition, the three year moving averages (to smooth out short-term fluctuations) of the tax plus SSC and domestic revenues over GDP were checked to look for the high and low performances and when these occurred in order to cross check the results estimated from the quadratic estimations.

Table 5.6: Trends and patterns in Tax plus SSC and in Domestic Revenue as shares of GDP by country groups over 1980-2013

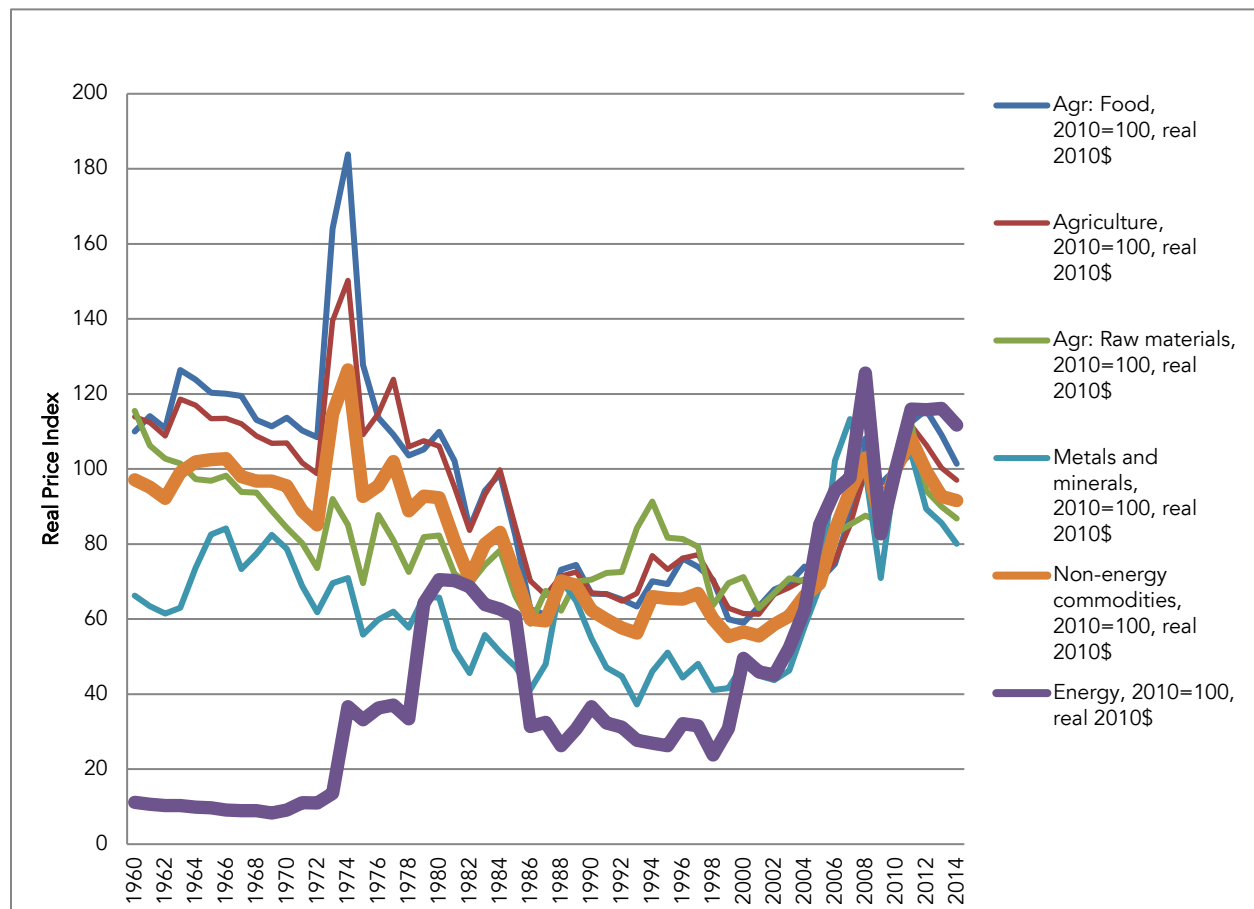
Group	Tax plus Social Security Contributions (SSC) as share of GDP							Domestic Revenues as share of GDP						
	Linear trend	3-year moving average of Tax + SSC				Max or min by quadratic estimation		Linear trend	3-year moving average of Domestic Revenues				Max or min by quadratic estimation	
		High (% GDP)	Year	Low (%GDP)	Year		Year		High GDP)	(% Year	Low (%GDP)	Year		Year
LIC	<i>pos</i>	14.1	2012	11.1	1994	min	1977	<i>pos</i>	16.4	2012	13.6	1990	max	2011
LMIC	<i>none</i>	21.8	1994	17.0	2013	max	2001	<i>none</i>	26.9	2007	20.8	2013	max	2001
UMIC	<i>pos</i>	26.2	2007	20.9	1987	max	2009	<i>pos</i>	32.5	2007	25.0	1987	max	2009
HIC	<i>neg</i>	35.6	1986	31.9	2009	min	2016	<i>neg</i>	43.5	1986	38.6	2003	min	2008
Oil revenue dominated (RG1)	<i>none</i>	7.5	1991	0.8	2013	max	1998	<i>neg</i>	82.6	1981	33.1	1993	min	2001
Resource Dependent Economies (RG2)	<i>none</i>	19.7	2012	14.9	1995	min	1995	<i>pos</i>	26.5	2007	19.7	1994	min	1993
South Asia	<i>pos</i>	11.4	2009	9.4	1983	min	1987	<i>pos</i>	15.7	2008	10.5	1980	min	2002
Sub-Saharan Africa	<i>weak pos</i>	17.4	2012	13.5	1994	min	1995	<i>none</i>	21.5	1983	16.2	1994	min	1996
East & Southeast Asia	<i>pos</i>	19.2	2012	14.1	1999	min	1994	<i>pos</i>	23.0	2011	17.7	1994	min	1995
Latin America	<i>weak pos</i>	20.2	2011	15.3	1992	min	1995	<i>pos</i>	23.6	2011	17.9	1993	min	1995
Former USSR	<i>none</i>	30.7	1993	22.8	2000	min	2002	<i>weak pos</i>	35.0	1993	25.1	1999	min	2001
Eastern Europe	<i>neg</i>	49.4	1982	31.1	2010	min	2005	<i>neg</i>	58.8	1980	32.9	1992	min	2004
Other Europe	<i>pos</i>	36.5	2006	33.1	1981	max	2004	<i>none</i>	44.3	1986	35.6	1980	max	1998

The results are summarized in Table 5.6. The apparent linear trends from the decade-by-decade results in

Figure 5.1 are generally confirmed by the significant linear trend lines through the annual data, but the upward trends are generally weaker in Sub Saharan Africa and Latin America.

When the “shapes” of the performance trends are examined, one interesting result arises that many country groups display a low or “minimum” in revenue performance and typically this falls in mid to late 1990s or early 2000s. This occurs for the resource dependent countries, Sub-Saharan Africa, East and South East Asia, Latin America and among the transitional countries of the former USSR. It can also be observed that with the exception of the former USSR country group, Table 5.6 shows the lowest revenue performance in the 1990s. This also occurs for the “residual” group and for the “all” countries group. This raises the key question of why the 1990s, particular in the latter half and through the early 2000s generated low revenue performances. One common factor that could contribute to this pattern of revenue performance is the impact of changing world commodity prices on the effective tax bases of countries, particular those that tend to be dependent on exploiting and often exporting commodities to generate a major part of their value added.

Figure 5.2: Commodity Price Indices (Real US\$, 2010=100), 1960-2014



Source: World Bank, Global Economic Monitor Commodities

When trends in real commodity prices are examined over recent decades going back to 1960, Figure 5.2 shows that the real commodity prices for most items were on a downward trend, with the exception of the early 1970s, through to the period around 1999 through 2001, depending on the specific commodity

group. Thereafter all real commodity prices rose rapidly through the 2000s with the exception of the impact of the great recession in 2009, before falling back somewhat after 2010 and then recovering in recent years at levels still markedly above their lows in the late 1990s. Figure 5.2 shows that since the 1980s, both energy (oil, gas and coal) and non-energy (agricultural, fertilizer and metal and mineral) commodity prices have followed a similar pattern, but the fluctuations in energy commodity prices have been much more volatile than non-energy commodities.³⁷

Rising real commodity prices tend to open up the value added margins available on these tradeable goods that result in real increases in the corporate income and other business tax bases. This affect can be magnified (or dampened) by any real devaluation (or appreciation) in the foreign exchange rate of a domestic currency. Studies of fluctuation ion corporate tax revenue yields across individual countries often show significant effects of the changes in the real producer prices coming about from either real world commodity prices and/or real exchange rates changing.³⁸ These general economic conditions affecting tax performance will be explored further in Section 7.

In section 6, the analysis turns to the cross country group comparison of the descriptive statistics that characterize that factors affecting the revenue performance within and between country groups. Table A 3.1 and Table A 3.2 give the detailed revenue performance of countries by income class and regional country groups for the overall sample of country observations and they are also broken out into before 2000 and 2000 and after. This broad break out of country revenue performance before and after 2000 follows from the observations above and in Section 2 that the general economic and fiscal performance internationally was markedly different after 2000.

³⁷ By 2017, the real non-energy commodity price index had recovered to around 90 after falling from a peak of 107 in 2001 to 84 in 2015, while the real energy commodity price index slumped to about 70 down from a peak of 116 in 2013, but up from a low of 58 in 2016.

³⁸ For an illustration of the strong effects of changing real exchange rate and world prices on the corporate tax revenues, Glenday (2008) and subsequent further work analyzed why the corporate tax revenue yield as a share of GDP in South Africa had dropped from around 5% down to 3% in the late 1990s and then climbed to over 7% by 2008 before starting to decline again down to 5% by 2011. These large tax yield fluctuations in the corporate tax have significant impacts on the overall domestic revenue performance.

Section 6: Comparison of country group values for key explanatory variables of revenue performance

6.1. Introduction

This section explores and compares how the group mean values of key explanatory variables of revenue performance change across country groups in income classes and country groupings. While regression analysis is used in section 7 to explore how these variables impact revenue performance both within and between income classes of countries, the regression model estimation approach becomes highly constrained by the availability of data for many of the explanatory variables such that only a limited number of countries and country years are available to estimate some models. This biases the estimates towards countries with better national statistics and often towards the experience of more recent years.

All estimates of the mean and standard deviation values for country groups along with the number of countries and country-year observations are provided in Annex 5. In addition, these statistics are provided for all available years as well as for the period before 2000 and for the years 2000 and after. This serves a number of purposes. It allows a broad view of major shifts in the levels of explanatory variables over time. It also gives a set of more recent estimates from 2000 and after. For a number of explanatory variables of revenue performance, these are only available in more recent years so that the 2000 and after period can be observed separately. It is also consistent with the pattern of revenue performance over recent years displayed in Table 5.6 and the pattern of real commodity price indices in Figure 5.2 discussed in Section 5 above. Furthermore, it matches the pattern of annual GDP growth rates over recent decades as shown in Table 6.1. This shows that lower growth rates in the 1980s and 1990s in regions such as Sub-Saharan Africa, Latin America, and the Caribbean and countries such as Indonesia, were followed by significantly higher growth rates in the 2000s in these regions. High growth rates across Asia was led by the high growth rates in the large economies of China and India. Only HICs, such as those in North America and the European Union, suffered a decrease in their average growth rates in 2000s compared to 1990s mainly because of the Great Recession in 2008-09.

Table 6.1: Annual average growth rates for selected regions and country over decades from 1970 through 2010

Region or country	Average annual GDP growth rate				
	1970s	1980s	1990s	2000s	Increment from 1990s to 2000s
Sub-Saharan Africa	4.4	1.4	2.0	5.5	3.5
South Asia	3.0	5.6	5.4	6.5	1.0
East Asia & Pacific (excluding HICs)	7.1	7.5	7.9	8.9	0.9
Latin America & Caribbean	6.1	2.1	2.8	3.1	0.3
Central Europe and the Baltics			1.4	3.9	2.5
European Union	3.6	2.3	2.2	1.6	-0.6
North America	3.6	3.1	3.1	1.8	-1.3
China	7.4	9.7	10.0	10.4	0.4

India	2.9	5.7	5.8	6.9	1.1
Indonesia	7.2	5.8	4.3	5.1	0.8

The remainder of Section 6 is devoted to summarizing the results of how the explanatory variables of revenue performance, which are discussed in Section 4, differ across country groups with the major focus on the differences across countries in different income classes. Where major differences exist across regional groups, these are noted as well. The explanatory variables are grouped into (i) macroeconomic factors, (ii) selected sector indicators of tax handles, (iii) formal and informal sector indicators, (iv) taxpayer capacity indicators, (v) governance indicators, and (vi) tax policy choice indicators.

6.2. Macroeconomic factors

The income level of a country as measured by its GDP per capita (expressed in this study in constant 2010 US\$) is the most basic indicator of likely tax performance. It is both an indicator of the ability-to-pay taxes in an economy as well as an indicator of the likely role of other structural features of an economy that may enhance or hinder revenue collections ranging from sector structures (such as the relative size of the agricultural sector) to the human capacity level of the taxpaying population. While Section 5 confirmed the consistent improved performance of countries on average as they moved up the income classes, there remains considerable variability in the revenue performance that relates to variations in the other factors impacting tax performance that vary within a and across income groups. Some added perspectives, however, need to be added here about how to think about GDP per capita and income classes.

The first is that while there is similar relative variability of GDP per capita within income classes (Table A 4.1 shows that standard deviations are around 50% of mean values), the range of incomes within these classes grows exponentially. For example, taking the ranges of GNI per capita in US\$ used by the World Bank in 2013, low income countries (LICs) fell in a range of \$1,045, lower middle income countries (LMICs) in a range of \$3,080, and upper middle income countries (UMICs) in a range of \$9,665. High income countries (HICs) started from GNI per capita of \$12,745. Inspection of the data shows that a number of small countries such as Monaco, Liechtenstein, United Arab Emirates and Luxembourg have recorded GDP per capita (pc) over \$100,000, while some larger industrial HICs such as Norway have reached over \$90,000 and Switzerland over \$75,000. Most of larger industrial HICs have GDP pc levels below \$60,000. This still leaves a range of income for most HICs of about \$50,000 and for all HICs of over \$100,000. While the highest revenue performances are typically observed by HICs, Table A 3.1 shows that domestic revenues as a share of GDP can go as low as 12% amongst HICs and as reach over 50% in low and middle income classes. This can reflect both public sector choices and structural variables determining the fiscal outcome in particular countries.

The second is to recognize that the taxpaying population is largely concentrated in the working age population (ages 15 through 65 years) rather than the dependent share of the population. Therefore, the impact of GDP pc gets mediated by the working age population share. Table A 4.1 shows that LICs have the lowest share of working age population, averaging about 54% compared to 67% among HICs. This indicates a typically unfavorable narrower tax paying population for lower income countries. From a regional perspective, Table A 4.2 shows Sub-Saharan African countries at the low end averaging about 53%, while Eastern European countries are at the high end of about 68% even though these countries have GDP pc of only around \$9,000 well below the \$40,000 of a typical HIC. This is a possible contributing factor to the relatively revenue performance.

A third consideration in the interpretation of income levels is that the Gross National Disposable Income (GNDI) of a country adjusts the GDP to include net Primary Income (or net Factor Receipts) and net Secondary Income (or net Transfers) typically dominated by net official grants and net remittances. In some countries, GNDI can exceed GDP by over 100%. Typically, many of these countries are small islands or countries that are excluded from this study, but there are other larger economies such as Albania, Afghanistan, Eritrea, Liberia, and Lesotho, which has had long histories of GNDI exceeding GDP. As discussed earlier in section 4, while the general expectation is that higher GNDI/GDP ratios would imply higher tax bases than would be expected by merely measuring GDP, there can be offsetting factors of how the domestic tax system interacts with the Net Primary and Secondary Income flows. Table A 4.1 and Table A 4.2 show that average GNDI/GDP, Net Primary Income over GDP and Net Secondary Income over GDP for country income classes and regional groups. Typically, GNDI/GDP exceeds unity at about 107% for LICs and 104% for LMICs, it falls to about 98% for UMICs and HICs. While both LICs and LMICs typically show Net Primary Income outflows of about 1% to 2% of GDP, they receive Net Secondary Income of about 9% for LICs and 6% for LMICs. UMICs typically receive positive Net Secondary Income, but this is more than offset by negative Net Primary Income. HICs tend to have negative Net Primary Income but have Net Secondary Income close to being in balance.

From a regional perspective, South Asia and Sub-Saharan Africa both have significant positive Net Secondary Income only partially offset by negative Net Primary Income. While Net Secondary Income inflows on average are also important in former USSR, Eastern Europe and Latin America, these are also partially or largely offset by Net Primary Income outflows. In sum, these additional components of Net Primary and Secondary Incomes can be significant, but the impacts on the revenue performance depends critically on how they interact with the tax systems of the particular country. In general, if a country receives large Net Secondary Income inflows as private remittances or transfers, then this is likely to boost the tax base of indirect taxes falling on a destination tax base. This is most likely to affect LICs and LMICs receiving major inflows of remittances.

The other macro variables examined here are the rates of general price inflation and the real purchasing power parity (PPP) exchange rates of countries. Table A 4.1 shows that typically inflation rates were high and very volatile before 2000 in all income groups except HICs. In the period 2000 and after high and volatile inflation rates are still found in the LICs, but significantly improved price stability is observed in LMICs and UMICs. Regionally, high domestic price instability was more evident in Sub Saharan Africa, Latin America and the Former USSR countries. High domestic price instability also usually translates into higher volatility in the real exchange rate. It is evident that the standard deviation in the real exchange rates declined in the period 2000 and after. Movements in the real exchange are important to the tax base of a country in that they combine with real world prices of tradable commodities to determine the domestic producer prices and taxable margins of domestic producers. A real devaluation has the same effect on domestic producers as real rise in the world price of a commodity. Similarly, a real appreciation can offset the gains to domestic producers of a rising world price. Accordingly, the revenue impacts of changing real world commodity prices discussed above in Section 5.4 has to analyzed jointly with the movements in the real exchange rate of a country.

6.3. Selected sector indicators

Key to the revenue performance of a country is the ease of tax administration, which in part depends upon the sector composition of an economy. Some sectors provide potentially good “tax handles” even in otherwise difficult to tax economies. These are important to explain the variance within income or regional groups of countries with otherwise similar income levels.

Imports of goods of goods have long been a target of taxation. The taxation of identifiable and controlled trade and production of goods historically provided a feasible and low tax administration cost tax handle for customs and excise revenue services of countries. Hence, imports of goods as a share of GDP has been a cornerstone indicator of potentially higher revenue performance. Table A 4.3 and Table A 4.4 show the imports of goods as a share of GDP across income and regional country groups. Generally, the most important observation is that goods import shares have been rising over time evidence of a continuing globalization of trade and production. In addition, there are not such major differences in goods trade across of different income levels, but HICs do have the highest share on average. It is important, however, to recognize that aside from the collection of import VAT/GST, import tariffs tend to decline as income levels grow. Typically, import duties make a negligibly small contribution to HIC revenues. The decline in import tariff rates implies that this indicator is likely to be most important in explaining differences in revenue performance within the LIC and LMIC groups where tariff levels are still significant. Note that there is significant variability in the goods import share within all groups. See also Table A 4.9 for average effective tariff rates.

The presence of a formal mining sector in an economy raises the potential of significant tax and non-tax revenues both if there are significant natural resource rents present and if there is an effective and efficient tax and/or non-tax system in place for the mining sector. The importance of the mining sector can be captured by a number indicators, namely, the mining valued added as a share of GDP, the shares of merchandise exports formed by fuel and ore and mineral exports, and the share of GDP formed by these natural resource exports. While the oil revenue dominated countries (eight countries mentioned in Section 5), which have averaged fuel exports of 84% of merchandise exports, all these indicators tend to be higher in the LMIC and UMIC groups. Ore and mineral exports and their related mining valued added are also important in some LICs. In all these income groups, the indicators have very high variability relative to their mean values, which indicates that the means are dominated by the natural resource dependent countries in each group. Natural resource exploitation does not show any significant pattern by region or with rising country income levels, but rather tends to be a more country specific phenomenon as to whether it dominates. It can be highly significant in an economy at any income level and depends crucially on whether revenue is effectively and efficiently collected from the resource rents. As noted in Section 5.2 above there are some 51, mainly middle income, countries that are resource dependent.

For some developing economies, tourism from HICs can provide a formal business enclave of hotels, restaurants, casinos, amusement parks, nature reserves, etc. and related domestic travel services that is amenable to effective tax administration. Typically, tourism expenditures in all income classes in the sample countries are below 1% of GDP with the highest mean level reaching 0.7% of GDP, but the maximum level of any country is up to about 20%. When the excluded small island and countries are also examined, average tourism expenditures rise to 2% of GDP and the maximum amongst these countries rises to over 50% of GDP. Clearly, there are countries, especially some small islands where the tourism sector dominates and can offer an effective tax handle to raise its tax performance, but for the average country, it is not a significant factor for revenue performance.

6.4. Formal and informal sectors

One of the key tax handles to facilitate tax administration is the formation of formal business entities and formal employment arrangements in an economy. This facilitates not only the administration of VAT/GST, but importantly the collection of income tax and social security contributions from the employment income which have together become the backbone of revenue collection in HICs. By contrast, economies with large informal business and employment arrangements are typically hard to tax. These informal sectors can also be characterized by high shares of non-monetary self-supply and trade as well as by businesses based on cash transactions, which may be both legal and illegal or underground, but typically maintain poor or non-transparent books and accounts.

Indicators of a high share of difficult to tax activities or negative tax handles in an economy include the share of agricultural value added in an economy and the share of rural population. These indicators assume that small-scale farming and business, particularly in LICs and to a lesser extent in LMICs, dominate agricultural and rural activities. These indicators tend to weaken among UMICs and HICs as larger corporate entities emerge in the agricultural and rural sectors. In Section 7, the within income class impacts will be studied, but here the focus is on between group differences. Table A 4.5 and Table A 4.6 show that there are major shifts in the sectors moving up from LICs to HICs as well as within regions over time as many countries in a region develop and move up the income class ladder. As Table 6.2 summarizes the mean indicator values for the period 2000 and after, the share of the agricultural sector and the rural population are significant indicators of the income class and the revenue performance of regions, which as before in Section 5 are ranked by increasing revenue performance. LICs averaged 31% agriculture and 68% rural, whereas HICs averaged 2% agriculture and 23% rural.

Table 6.2: Mean values of indicators of informal (hard to tax) and formal sectors by countries in income groups and regional groups in sample period 2000 and after

	Agricultural value added/ GDP (%)	Rural population share (%)	Shadow economy/ GDP (%)	Paid employed labor force/ working age population (%)	Compensation of employees/ GDP (%)
Countries by income class					
LIC	31.0	68.3	40.2	17.6	30.4
LMIC	13.2	48.1	38.5	29.0	47.9
UMIC	6.5	33.7	31.3	38.0	59.8
HIC	2.2	22.5	17.8	48.2	64.0
Countries by selected regional groups					
South Asia	24.1	73.9	33.6	21.1	36.4
Sub Saharan Africa	26.9	65.3	40.5	19.9	33.2
East and Southeast Asia	15.0	53.7	28.4	38.9	52.6
Latin America	10.5	32.5	41.0	34.6	53.2
Former USSR	13.0	43.5	43.5	37.3	54.6
Eastern Europe	8.2	42.3	27.5	36.2	64.7
Other Europe	2.1	21.0	18.2	47.3	62.7
Residual countries	6.8	28.4	23.2	39.7	57.8
All (ex RG1 and small countries and islands)	14.4	45.1	33.1	37.7	53.8

The agricultural and rural population shares are useful and readily available indicators for a country of its likely revenue performance. By contrast, national statistics generally lack indicators of the degree of formality of monetary transactions in the economy, and importantly the degree of formality of urban and rural employment. The share of the shadow economy gives indirect estimates of the share of monetary transactions uncaptured by the formal estimates of the GDP. These excess monetary transactions could be both legal (above ground) and illegal (underground) activities. Both are a challenge for the tax administration. These shadow economy estimates only cover less than 10% of the sample observations before 1980 and about 60% in the period 2000 and after. For the latter period, Table 6.2 shows a consistent decline in the share of the shadow economy moving from LICs at 40% to HICs at 18%. Interestingly, the pattern of the shadow economy shares across regional groups is not as consistent with the revenue performance of these groups. The highest regional group averages are in Latin America and the Former USSR countries, at similar levels to Sub-Saharan Africa, but significantly above South Asia and East and South East Asia. Another weakness of the shadow economy share indicator is that it does not give clear indications of the source of the shadow economy. These could include a high share of informal, but legal business activities in rural or urban areas, or a high share of illegal business activities, or possibly an underestimate of the GDP, particularly in economies with large non-monetary agricultural sectors.

More direct indicators of positive tax handles in an economy are (i) the share of paid employees (typically public sector employees and private sector corporate employees) relative to the adult population, and (ii)

the share of employee earnings out of GDP.³⁹ Both of these key indicators suffer from weak coverage, especially prior to 2000, except for HICs due to weak labor force surveys in many countries. Even in the period 2000 and after, the coverage among LICs is only about 30%. LMICs about 60% and UMICs about 80%. Table 6.2 shows that both of these indicators move consistently upward moving from LICs to HICs and reasonably consistently moving across the regional groupings, at least between the extremes. The paid employee share of the adult population rises from 18% for LICs to 48% for HICs, and the employee compensation share of GDP rises from 30% for LICs to 64% for HICs. Note that paid labor force share of the adult population can be translated into the share of the labor force using the labor force participation rate. For example, if the LIC participation rate is 60%, then the paid employees form only 30% of the labor force, while for HICs, if the labor force participation rate is 70%, then the paid employees form 69% of the labor force. If the HIC paid employees form as much as 65% of the adult population, then they would form 92% of the labor force.

These indicators of the relative sizes of the formal or informal sectors are clearly powerful indicators of the income level and likely revenue performance of a country.

6.5. Taxpayer capacity

With the general shift in taxation towards broad and self-compliance-based tax systems (primarily the income tax and VAT/GST), the critical importance of the general and specific skill capacities of the taxpaying adult population is a key enabler or constraint on revenue performance. Unfortunately, the availability of educational attainment statistics across countries is generally weak among developing countries and was even weaker prior to 2000. While some basic statistics are available for adult literacy and primary completion rates, data on more advanced and specific levels of educational attainment on a cross-country basis are even weaker.

Table A 4.7 and Table A 4.8 give the adult (25 years plus) literacy and primary completion rates by income class and regional groupings, mainly for the period 2000 and after. These results are highly congruent with the revenue performance of the groups. Adult literacy rates are LICs 55%, LMICs 84%, UMICs 94% and HICs 98%, and adult primary completion rates follow a similar pattern of LICs 46%, LMICs 69%, UMICs 84% and HICs 94%. There is also a large variability in the rates among LICs and LMICs, which indicates that these general educational attainment levels would explain some of the variance in the revenue performance within these groups. The results for the regional groupings are fairly consistent with the revenue performance across these groups. Interestingly, the high levels of general education attainment in the Former USSR and Eastern Europe facilitate the higher than expected revenue performance in these regions.

The tables also provide the primary completion rates of current graduates in the time periods. These show higher current than adult completion rates in all income classes, but the increase is almost 20 percentage points for LICs and LMICs. All income classes also show increases in the current completion rates post 2000 compared to pre 2000. Generally, these rising primary completion rates predict rising adult general capacity to comply with taxation going forward in the lower income countries.

³⁹ Both of these measures could be enhanced if by indicators such as (i) the number of formal self-employed persons, such as many types of professional, and (ii) the share of the formal mixed income of unincorporated businesses, could be made available in national statistics. This requires detailed breakouts of the self and informally employed labor force in a country.

Table 6.3 gives the most recent adult education attainment results. It gives the two extremes: adults with no schooling and adults with post-secondary education. The results for no schooling are consistent with the adult literacy results. LICs show a no schooling rate of 44%, which is consistent with an average adult literacy rate of 55%.

Table 6.3: Educational attainment of adult population (25 years and older) by income class of countries based on latest year available

Income class	Number of countries	Latest year			Adult population with no schooling (%)		Adult population with post-secondary education (%)		Adult population with post-secondary education excluding short cycle tertiary (%)	
		Median	Earliest	Latest	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation
LIC	19	2011	2008	2012	43.6	<i>26.5</i>	4.7	<i>5.0</i>	4.0	<i>4.8</i>
LMIC	28	2012	1998	2015	12.4	<i>16.1</i>	12.7	<i>10.0</i>	10.8	<i>7.8</i>
UMIC	32	2012	2001	2014	8.6	<i>8.9</i>	15.2	<i>10.7</i>	11.9	<i>6.5</i>
HIC	55	2014	2003	2014	2.2	<i>3.3</i>	25.3	<i>10.2</i>	19.6	<i>10.0</i>

Source: UNESCO Institute for Statistics, February 2016

The shares of the adult population with post-secondary education in Table 6.3 show the major deficit of LICs at about 5% compared to LMICs at about 12%, and again about a 10% deficit between HIC and UMICs. This indicates the difficulties that the lack of advanced human capacity, particularly in LICs is likely to have on both administration and compliance with complex tax systems such as the income tax. Unfortunately, there is a lack of data across countries of more tax specific skills such as in bookkeeping, accounting and tax advisory services that are crucial to effective tax compliance.

6.6. Governance indicators

As already discussed in Section 4 above, given the lack of comparable cross-country indicators of the effectiveness and efficiency of country tax administrations, some general governance indicators that are available since about 1983 and across most countries in the data sample. One such set of indicators are the 12 ICRG indicators. See Table A 4.9 and Table A 4.10. Each are scored here out of 10 and a composite average score out of 100. Generally, these indicators, except for Government Stability, tend to rise with rising income class and revenue performance. The largest spread between HIC and LIC average scores occurs in Bureaucratic Quality followed by Military in Politics and Socioeconomic Conditions. For a number of the indicators, more than 50% of the spread between HICs and LICs occurs between HICs and UMICs. This is the case most importantly for Corruption, then Law and Order, then Bureaucratic Quality and Socioeconomic Conditions. This implies that, while these same variables would be expected to indicate stronger tax administration capabilities, these variables would be weaker in explaining differences in revenue performance among low and middle income countries. The variables with the lowest spreads between HIC and LIC averages are Government Stability, then External Conflict, Religion in Politics, Internal Conflict and Ethnic Tensions. These variables also tend to have low correlations with other indicators. By contrast, Socioeconomic Conditions, Military in Politics, Bureaucratic Quality, and Corruption and Law and Order have high correlations of over 0.5 with at least 5 other indicators. The remaining indicators, Law and Order, Internal Conflict, Democratic Accountability, and Investment Profile

have between 1 and 3 high correlations with other indicators and intermediate correlations (0.3 to 0.5) with most of the remainder.

The ICRG Composite Index (see Table A 4.11) has high correlations with all its components except for Government Stability where the correlation is of intermediate strength.

When the ICRG Indicators are correlated with the components of the World Governance Index, a similar pattern emerges. Government Stability, External Conflict, Religion in Politics and Ethnic Tensions have high correlations with one or no WGI components. By contrast, Socioeconomic Conditions, Investment Profile, Internal Conflict, Military in Politics Law and Order and Bureaucratic Quality have high correlations with all components of the WGI. The ICRG Composite Index has high correlations with all the components of the WGI – the lowest correlation is 0.82. In addition, all the components of the WGI have high correlations with all the other components.

6.7. Tax policy choice indicators

There are two basic tax policy choices addressed in this study: first, the tax rates on the various major tax bases, and second, the tax expenditures used by a country that effectively reduce the tax bases and/or rates for selected taxpayers. Tax expenditures are dealt with in Section 8, while some basic tax rate indicators are presented here.

Table A 4.12 and Table A 4.13 present the tax rate indicators from the income class and regional country groups for the sample values in the periods before 2000 and 2000 and after. The tax rate indicators used here are (i) trade weighted import tariff rate, (ii) the top combined personal income tax (PIT) rate, (iii) the combined corporate tax (CIT) rate, (iv) the regular VAT or GST rate and (v) a domestic tax rate indicator. These variables are discussed in more detail in Section 4.

Table 6.4 summarizes the basic results in Table A 4.12 and Table A 4.13. While some caution needs to be taken about the trends over time given the much lower availability of tax rate data for the earlier period before 2000, many of the differences between the time periods are large and consistent with known changes in tax rates.

The average tariff rates display a consistent pattern of tariff rates declining over time and from LICs (10.3%) to HICs (1.6%). The largest declines in tariff rates came in the LICs from 19.8% down to 10.3% and even larger declines occurred in the South Asia from 33.7% down to 12.6%. Significant declines also occurred in Sub-Saharan Africa, East and South East Asia and Latin America. Former USSR, Eastern Europe and Other Europe follow a similar pattern to HICs. Note that with a tariff rate of only 1.6%, it is expected that tax revenues from import duties will form a negligibly small share (below 1%) of revenue of GDP for HICs.

Table 6.4: Tax rate indicators for countries in income classes and regions in sample periods before and after 2000, mean values

	Trade weighted import tariff rate (%)		Top combined personal income tax (PIT) rate (%)		Combined corporate income tax (CIT) rate (%)		VAT/GST rate (%)		Domestic tax rate indicator	
LIC	19.8	10.3	38.5	32.4	39.1	30.3	16.7	15.0	44.9	37.1
LMIC	9.9	7.0	31.2	27.9	33.9	27.8	11.9	14.1	36.2	34.5
UMIC	8.1	4.6	37.8	27.1	35.9	24.0	17.1	16.9	41.7	34.5
HIC	4.4	1.6	51.0	40.5	38.3	27.4	14.9	17.7	47.4	40.8
South Asia	33.7	12.6	-	26.6	36.4	33.3	-	14.2	-	36.1
Sub Saharan Africa	15.8	9.6	41.3	32.8	42.2	30.5	18.2	15.4	45.7	36.4
East and Southeast Asia	12.2	4.4	34.3	33.8	34.2	27.3	9.2	9.6	37.9	35.8
Latin America	11.1	6.5	31.1	28.7	30.2	28.9	13.8	14.7	36.7	35.9
Former USSR	4.6	3.3	28.0	20.9	27.5	20.2	18.0	18.0	-	31.6
Eastern Europe	4.3	2.5	41.7	25.6	35.8	17.9	23.8	20.2	44.2	34.0
Other Europe	4.2	1.4	50.3	43.5	41.4	28.0	18.3	19.4	47.2	42.4
Residual countries	9.8	6.8	-	36.5	40.5	29.4	9.2	12.4	-	39.1
All (ex RG1 and small countries and islands)	8.4	5.8	40.8	32.8	39.4	27.0	14.8	16.3	41.9	37.4

Domestic tax rate are represented by the top PIT rate, the CIT rate, and the VAT or GST rate. Generally, both the top PIT rate and the CIT showed declines between the two periods with the largest declines in the UMICs and HICs. While the top PIT rate and CIT rate are generally similar for LICs and LMICs, a gap of about 3% opens up on average for UMICs and a major gap of about 13% between the top PIT rate and the CIT rate exists for HICs. This “Nordic” income tax structure of a CIT rate markedly below the PIT rate reflects the pressures of competing for investment capital in the open and integrated capital markets among the HICs. Note that HICs have the highest top PIT rates on average, but CIT rates are fairly similar on average across all income classes on average. LICs also tend to have somewhat higher income tax rates than LMICs and UMICs.

From a regional perspective, Other Europe has the highest PIT rate and also the largest gap at 15% between the top PIT rate and CIT rate. Sub-Saharan Africa, Former USSR and Eastern Europe showed significant cuts in both PIT and CIT rates. In the 2000 and after period, the regions of the Former USSR and Eastern Europe show the lowest average CIT rates at 20.2% and 17.9%, respectively, and the Former USSR countries average the lowest top PIT rate at 20.9%.

From an income class perspective, VAT/GST rates are fairly similar on average at around 15%. For a regional perspective, however, some more distinctive patterns emerge. Europe has the highest rates averaging around 20%, the Former USSR is lower at 18%, and East and South East Asia has the lowest rates averaging around 10%. All other regions tend to average around 15%.

Finally, a domestic tax rate indicator summarizes the income tax and VAT/GST rate indicators by adding half of each of the PIT and CIT rates to the VAT/GST rate,⁴⁰ but weighting the income tax rates by the inverse of (1+VAT/GST rate). This reflects that the indirect taxes reduce the value added available for the income tax bases and by weighting the VAT/GST rate by (1-(PIT rate +CIT rate)/2) it reflects that the income tax reduces the disposable income available to indirect taxes on consumption expenditures.⁴¹ These weights effectively recognize the offsetting effect of raising indirect taxes on the direct taxes and vice versa. They also result in reducing the variability in the overall domestic tax rate indicator. For example, the low VAT/GST rate in East and South East Asia puts relatively more weight on the PIT and CIT rates so that the overall indicator rises closer to the average of about 37. The highest domestic tax rate indicators are among HICs (40.8) and Other Europe (42.4) countries and the lowest in the Former USSR countries (31.6) with low CIT and PIT rates followed by Eastern Europe (34).

6.8. Summary points

Aside from the consistent patterns and level of revenue collection by income class and region shown in Section 5, this Section brings out the explanatory variables that have major differences across income classes and regions. **The indicators that show up strongly as explaining differences between groups are GDP per capita, indicators of the degree of formality or informality of the economy (agricultural sector and rural population shares, shadow economy shares, paid employee and employee compensation shares), indicators of taxpayer capacity for tax compliance, import tariff rates, net secondary income as share of GDP, working age population share and inflation rates and real exchange rate instability.** While many indicators have average values of indicators of tax performance in line with the average GDP per capita of a region, some regions are not in line on some indicators. The Former USSR and Eastern Europe, for example, have higher revenue performance than expected for middle income countries, high shares of working age population, high shares of formal employment, high levels of education, high goods import shares, but low income tax rates. East and South-East Asia has very high goods import shares, but low VAT/GST 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. Unfortunately, where some indicators (such as adult educational attainment or formal employment), have poor coverage especially among LICs and LMICs, it get harder to measure the impact of these indicators of revenue performance within a group. In Section 7 below, estimates are obtained of the impact within income classes of many of the indicators discussed in this section.

⁴⁰ In Section 4, two domestic tax rate indicators are shown. Indicator 1 has the PIT and CIT rates at their full values and Indicator 2 has the PIT and CIT rates at half their values. Indicator 2 puts equal weight on income tax and VAT/GST rates, whereas Indicator 1 puts a higher weight on income tax rates. In the estimation of tax capacities discussed in Section 7, it was found that Indicator 2 had better explanatory power. Accordingly, only Indicator 2 results are presented here.

⁴¹ Domestic tax rate indicator = (CIT rate + PIT rate)/(1+VAT/GST rate/100)/2 + (1-(1/2*CIT rate/100+1/2*PIT rate/100))*VAT/GST rate

Section 7: Estimation of tax and revenue capacity and effort

7.1. Introduction

This section takes the analysis of the tax performance of different country types further using regression techniques to identify the statistically significant and important determinants of both the tax (including social security) and the domestic revenues as shares of GDP. These estimations not only allow an improved explanation of tax and revenue performance, but they also allow the determination of the “tax and revenue capacity” of a country at a point in time based on its prevailing economic structures, economic environment and tax policy choices that are expected to impact on its tax and revenue performances. This estimated tax and domestic revenue capacity of a country is then compared with its actual tax and revenue performance to assess its tax and revenue efforts. To the extent that a country has a low effort and has low tax rates, then it indicates that performance could be improved through increasing tax rates, cutting tax expenditures and/or improved tax administration and compliance, but it could also indicate a policy preference for a small efficient public sector. By contrast, if the country already has high tax rates, then its options to mobilize revenues are restricted to cutting tax expenditures and/or improved tax administration and compliance. The other extreme is the country with high tax and revenue effort and high tax rates, then its options to increase yields are more constrained to cutting tax expenditures to further increase its yields. This type of analysis allows consideration of particular countries and groups of countries to assess their prospects to make increases in their domestic revenues. The use of tax rate indicators in this work is somewhat novel in that most older studies did not account for these key variables in explaining tax performance. The combination of estimating both tax and domestic revenue is also particularly important in the context of countries with significant mining sectors where the split of natural resource revenues between tax and non-tax revenues can vary significantly across countries.

The analysis presented below first gives the estimation of the determinants of the tax (including social security contributions) as a share of GDP, and then the determinants of domestic revenues as share of GDP. In addition, two sets of estimation are presented. First, the “basic” set which focuses on the economic structures, regional and general economic characteristics as determinants of tax and revenue capacity. In a second set, tax rate indicators are added that significantly increase the explanatory power of the estimations, but also significantly reduce the number of countries and years that can be used in the estimations, mainly to higher income countries and to more recent decades for which data are available. Similar data availability problems arise with other key determinants such as labor force, educational attainment, size of shadow economy, etc.

Generally, the analysis builds on the findings in earlier sections. It shows the differences in the determination of revenue performance within and between income classes and the importance of regional effects. Importantly it shows the source of the within group tax capacity variation and how these explanations vary across income groups. It brings out the importance of general versus central revenues. It examines the importance of economic structural variables expected to impact on technical efficiency of raising tax and domestic revenues. It also examines the effects of the grants and non-tax revenue on the incentives to use taxation to raise revenues. It accounts for some of the general macro-environment affecting taxation such as the world commodity prices and the real exchange rate in an economy.

7.2. Determinants of tax capacity

Table 7.1 presents the determinants of tax (including social security) as share of GDP by income class for a set of basic specifications, while Table 7.3 includes the tax rate indicators. Based on the results in these two tables, Table 7.2 and Table 7.5 give the estimated impact in changes in the magnitudes of some of the determinants of the estimated tax capacity.

Table 7.1: Determinants of Taxes (including SSC) as share of GDP (%) by income class, basic specification for sample period

Explanatory variables	LICs		LMICs	UMICs	Explanatory variables	HICs
	(1)	(2)				
GDP per capita (constant 2010 USD)	0.004 (2.453)**	0.005 (2.359)**	0.001 (2.202)**	0.00009 (0.366)	GDP per capita (constant 2010 USD)	0.00004 (0.898)
General government revenue data	1.01 (0.819)	1.08 (0.913)	1.33 (1.284)	2.12 (1.985)**	General government revenue data	4.03 (1.721)*
Sub-Saharan African country	5.39 (1.998)**	6.21 (2.220)**	5.296 (1.580)	5.10 (1.633)	Norway	2.96 (1.221)
South Asian country	2.29 (0.745)	2.86 (0.949)	-2.98 (-1.103)	-	Luxembourg	-1.20 (-0.439)
Latin American country	3.26 (1.356)	3.8 (1.615)	-0.06 (-0.0222)	-1.03 (-0.335)	Switzerland	-12.1 (-6.321)***
					Small Asian HICs: Singapore, Hong Kong, Macau	-7.62 (-2.294)**
East and Southeast Asian country	4.25 (1.243)	4.82 (1.424)	2.09 (0.714)	-0.48 (-0.136)	East and Southeast Asian country	-3.12 (-1.253)
Former USSR transitional country	10.67 (2.486)**	10.80 (2.578)***	7.34 (2.070)**	8.36 (2.413)**	Former USSR transitional country	2.15 (0.831)
European country	4.90 (1.584)	3.38 (1.136)	11.20 (3.657)***	12.05 (3.515)***	European country	8.37 (3.346)***
Net secondary income to GDP		0.078 (2.038)**				
Working age population ratio	-0.12 (-1.051)	-0.09 (-0.822)	0.02 (0.164)	-0.20 (-0.893)		
	-0.0018	0.008	-0.215	-0.383		

Non-tax revenue	<i>(-0.0253)</i>	<i>(0.117)</i>	<i>(-2.328)**</i>	<i>(-4.025)***</i>		
Grants	-0.017	-0.034	-0.420	-0.574		
	<i>(-0.610)</i>	<i>(-1.113)</i>	<i>(-2.494)**</i>	<i>(-1.962)**</i>		
Goods imports to GDP	0.064	0.052	0.027	-0.008		
	<i>(3.499)***</i>	<i>(2.821)***</i>	<i>(0.817)</i>	<i>(-0.434)</i>		
Agricultural value-added to GDP	-0.0519	-0.0305	-0.146	-0.017		
	<i>(-1.158)</i>	<i>(-0.653)</i>	<i>(-1.822)*</i>	<i>(-0.0913)</i>		
World non-energy commodity price index (2010=100, real 2010 USD)	0.045	0.043	0.035	0.032		
	<i>(3.390)***</i>	<i>(3.344)***</i>	<i>(1.658)*</i>	<i>(1.996)**</i>		
Real exchange rate index (D\$/US\$, PPP 2010)	0.0001	0.0001	0.0087	0.0113		
	<i>(1.075)</i>	<i>(1.120)</i>	<i>(1.135)</i>	<i>(0.895)</i>		
Constant	6.67	3.71	10.42	29.95**	Constant	22.64
	<i>(1.264)</i>	<i>(0.719)</i>	<i>(1.555)</i>	<i>(2.111)</i>		<i>(7.082)***</i>
Observations	905	872	674	400	Observations	880
Number of countries	56	55	62	41	Number of countries	43
R²within	33.8%	34.0%	24.7%	18.3%	R²within	9.3%
R²between	44.7%	44.9%	49.2%	60.3%	R²between	66.1%
R²overall	40.8%	40.9%	36.9%	58.0%	R²overall	61.4%

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Two key differences show up between these two sets of estimations. First, the basic specifications manage to explain about 40% to 60% of the variation in the tax capacities across countries, but this rises to some 70% to 78% when the tax rate indicators are added. Second, when tax rate indicators are added, the size of the available sample of observations drops markedly and shifts mainly to data from more recent years, particularly among LICs where the number of available observations drops from 905 to 81 and the number of different countries from 56 to 15. This contrast with HICs where the observation drop more modestly from 880 to 412 and the number of countries from 43 to 40. HIC tax indicator data is more readily available for most countries and over a longer time horizon than for lower income countries where data is available for fewer countries and generally over more recent years. See Table A 3.1 and Table A 3.2 for the availability of tax and other revenue data, and Table A 4.12 and Table A 4.13. The advantage of more countries over a longer period of observation is that it gives a greater range of country experience and changing economic structures and general economic environment to strengthen the estimation of the effects of these variables. For example, discussed in Section 5 and illustrated in Figure 5.2, the world commodity price movements facing countries were generally in a downward direction prior to 2000 and an upward direction after 2000 so that it is useful to have a strong pre-2000 representation in estimating

the impacts of world commodity prices on revenues. This is the case in the basic specifications in Table 7.1, but less so in Table 7.3, which include the tax rate indicators.

Table 7.2: Estimates of impacts on Tax (including SSC) as share of GDP (%) of selected explanatory variables based on estimation models in Table 7.1

Explanatory variable	Size of change in explanatory variable	LICs		LMICs	UMICs	HICs
		(1)	(2)			
GDP per capita (constant 2010 USD)	100	0.43	0.46	0.12	0.01	0.004
General government revenue data	1	1.01	1.08	1.33	2.12	4.03
Non-tax revenue	1%	-0.002	0.01	-0.22	-0.38	ns
Grants	1%	-0.02	-0.03	-0.42	-0.57	ns
Net secondary income to GDP	10%	0.78				
Goods imports to GDP	10%	0.64	0.52	0.27	-0.08	ns
Agricultural value-added to GDP	10%	-0.52	-0.31	-1.46	-0.17	ns
World non-energy commodity price index (2010=100, real 2010 USD)	10	0.45	0.43	0.35	0.32	ns
Real exchange rate index (D\$/US\$, PPP 2010)	10	0.001	0.001	0.09	0.11	ns

Table 7.2 illustrates the different impacts on tax capacity of countries in different income classes of changes in some key determinants. Importantly, the positive impact of increases in real GDP per capita declines markedly from LICs to HICs. Effectively, it is expected that, on average, a one-percentage point increases in tax capacity arise from the following increases in GDP per capita: \$250 for LICs, \$800 for LMICs, \$10,000 for UMICs and \$25,000 for HICs. A similar pattern is illustrated in Table 7.4 based on the specifications including tax rate indicators.

General government tax revenues are on average about 1% of GDP higher than central for LICs but rise to about 4% higher for HICs. This is consistent for the results for the overall sample shown in Table 5.4 above. In Table 7.4, however, when based on observations with tax rate indicators, then for this reduced sample, general government tax revenues are 4% higher for these LICs and 6% higher for these HICs.

Higher non-tax revenues generally result in lower collections of tax revenues particularly for MICs where added non-tax revenues reduce taxes by about 20% to 40% of the amount of non-tax revenues. This

generally arises where governments have access to royalties and other income streams from state owned enterprises, and particularly from natural resource based enterprises. The extreme cases of the high income and high revenue oil-revenue-dominated countries, which gain only about 10% of their domestic revenues on average from taxes were illustrated in Section 5, Table 5.1. The effect of high mining sector value added is discussed further below in estimating the domestic revenue capacity.

Higher external grants received by developing country governments tend to reduce tax performance, again especially among MICs by about 40% to 60% of the amount received. This effect is minimal among LICs (Table 7.2) and may even induce added taxes (Table 7.5). Some added investigation is needed to check whether (i) donors are allocating more grants to better performing countries and (ii) to control for the effects of grants rising in the 2000s along with improved tax performance.

As discussed in Section 4, the impacts of net primary and secondary income on tax collections depends both upon their tax treatment and who receives this income. For example, net primary income may escape domestic tax and net secondary income received as grants by a government may generate tax exempt purchases by the government aside from substituting for tax effort. By contrast, net secondary income such as remittances received by households are likely to boost consumption expenditures and related revenues. The second basic specification for LICs in Table 7.1 shows that 10% of GDP in secondary income raises taxes by 0.76% of GDP.

Goods imports as a share of GDP are important tax handles especially in the case of LICs with estimates that a country with goods imports 10% of GDP higher than another has between 0.5% and 1.4% of GDP higher in tax. This impact is still significant for LMICs with an increase of about 1% of GDP in taxes, but drops off to insignificant impacts for HICs as the trade weighted import tariff rate drops from around 11% for LICs to below 2% for HICs (see Table A 4.12).

The size of the agricultural sector is an important constraint on tax collections especially among LICs. A LIC with a 10% of GDP larger agricultural sector is expected to collect between 0.4% and 2% less in tax, and similarly, a LMIC is expected to have a lower collection by from 1.2 to 1.5% of GDP less. This effect drops off among UMIC and HICs as the share of the agricultural sector fall from around 32% for LICs down to below 3% on average for HICs. In addition, the tax compliance capacity of the agricultural sector also rises as income levels rise.

Table 7.3: Determinants of Taxes (including SSC) as share of GDP by income class, specification including tax rate indicators

Explanatory variables	LICs	LMICs	UMICs	Explanatory variables	HICs
	<i>Tax rate index</i>	<i>Tax rate index</i>	<i>Tax rate index</i>		<i>Tax rates</i> <i>Tax rate index</i>
GDP per capita (constant 2010 USD)	0.004 (2.051)**	0.001 (1.672)*	0.0003 (2.003)**	GDP per capita (constant 2010 USD)	0.0001 (2.388)** 0.00003 (0.707)
General government revenue data	3.94 (2.599)***	4.84 (3.064)***	4.049 (3.437)***	General government revenue data	6.16 (1.678)* 5.83 (1.545)
				Norway	-1.81 (-0.763) 2.96 (1.360)
Sub-Saharan African country	9.85 (1.143)	3.84 (1.222)	4.71 (1.623)	Luxembourg	-2.52 (-0.935) -0.59 (-0.236)
South Asian country	1.18 (0.116)	-0.38 (-0.119)	- (-)	Switzerland	-6.91 (-3.179)*** -9.25 (-5.680)***
Latin American country	1.70 (0.163)	3.20 (0.999)	-7.08 (-2.870)***	Small Asian HICs: Singapore, Hong Kong, Macau	-11.24 (-11.47)*** -9.81 (-7.638)***
East and Southeast Asian country	-4.70 (-0.353)	0.06 (0.0165)	-9.54 (-4.365)***	East and Southeast Asian country	-0.93 (-0.603) -3.60 (-2.825)***
Former USSR transitional country	- (-)	11.12 (1.561)	-0.41 (-0.205)	Former USSR transitional country	1.06 (0.454) 3.23 (1.573)
European country	- (-)	7.07 (2.167)**	1.08 (0.416)	European country	4.49 (2.600)*** 6.96 (4.258)***
Working age population ratio	0.62 (1.622)	0.21 (0.977)	0.50 (3.153)***	Compensation of employees to GDP	0.004 (0.796) 0.003 (0.432)
Non-tax revenue	-0.002 (-0.00571)	-0.122 (-0.795)	0.021 (0.268)		
Grants	0.45 (2.863)***	-0.06 (-0.422)	-0.42 (-2.190)**		

Goods imports to GDP	0.137 <i>(1.885)*</i>	0.103 <i>(3.139)***</i>	0.003 <i>(0.154)</i>			
Agricultural value-added to GDP	-0.204 <i>(-2.149)**</i>	-0.125 <i>(-0.996)</i>	0.038 <i>(0.193)</i>			
World non-energy commodity price index (2010=100, real 2010 USD)	-0.009 <i>(-0.372)</i>	0.012 <i>(0.332)</i>	0.033 <i>(2.245)**</i>	World non-energy commodity price index (2010=100, real 2010 USD)	-0.024 <i>(-3.164)***</i>	
Real exchange rate index (D\$/US\$, PPP 2010)	0.032 <i>(2.404)**</i>	0.020 <i>(0.720)</i>	0.024 <i>(2.402)**</i>	Corporate income tax rate	0.063 <i>(1.309)</i>	
Trade weighted import tariff rate	-0.117 <i>(-1.672)*</i>	0.173 <i>(1.750)*</i>	0.008 <i>(0.107)</i>	Personal income tax rate	0.038 <i>(1.140)</i>	
				VAT/GST rate	0.458 <i>(3.633)***</i>	
Domestic tax rate indicator	0.725 <i>(3.141)***</i>	0.107 <i>(1.416)</i>	0.097 <i>(0.949)</i>	Domestic tax rate indicator	0.19 <i>(2.609)***</i>	
Composite Country Risk Indicator	0.047 <i>(0.539)</i>	-0.025 <i>(-0.272)</i>	0.117 <i>(2.331)**</i>	Composite Country Risk Indicator	0.063 <i>(1.291)</i>	
Constant	-63.27 <i>(-3.055)***</i>	-11.86 <i>(-0.920)</i>	-20.74 <i>(-1.690)*</i>	Constant	11.99 <i>(2.639)***</i>	9.51 <i>(1.732)*</i>
Observations	81	157	197	Observations	412	412
Number of countries	15	26	29	Number of countries	40	40
R ² within	23.0%	23.3%	31.8%	R ² within	18.2%	13.9%
R ² between	92.4%	76.9%	70.6%	R ² between	78.3%	72.4%
R ² overall	77.0%	70.6%	71.8%	R ² overall	71.4%	62.1%

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7.4: Tax rate indicator determinants of Taxes (including SSC) as share of GDP by income class

Explanatory variables	LICs	LMICs	UMICs
Corporate income tax rate	0.227 <i>(1.131)</i>	0.050 <i>(0.950)</i>	0.161 <i>(3.228)***</i>
Personal income tax rate	0.234 <i>(3.176)***</i>	0.033 <i>(0.782)</i>	-0.012 <i>(-0.463)</i>
VAT/GST rate	0.401 <i>(1.387)</i>	0.141 <i>(0.347)</i>	0.115 <i>(1.018)</i>

Table 7.5: Estimates of impacts on Tax (including SSC) as share of GDP (%) of selected explanatory variables based on estimation models in Table 7.3

Explanatory variable	Size of change in explanatory variable	LICs	LMICs	UMICs	HICs
GDP per capita (constant 2010 USD)	100	0.36	0.10	0.03	0.009
General government revenue data	1	3.94	4.84	4.05	6.16
Non-tax revenue	1%	-0.002	-0.12	0.02	ns
Grants	1%	0.45	-0.06	-0.42	ns
Goods imports to GDP	10%	1.37	1.03	0.0338	ns
Agricultural value-added to GDP	10%	-2.04	-1.25	0.375	ns
World non-energy commodity price index (2010=100, real 2010 USD)	10	-0.09	0.12	0.33	ns
Real exchange rate index (D\$/US\$, PPP 2010)	10	0.32	0.20	0.24	ns
Trade weighted import tariff rate	1%	-0.12	0.17	0.01	
Domestic tax rate indicator	1.2	0.87	0.13	0.12	0.23
Corporate income tax rate	1%				0.06
Personal income tax rate	1%				0.04
VAT/GST rate	1%				0.46

The combination of world commodity prices and the real exchange rate of a country determines the real producer prices of tradable products in a country. Rising producer prices typically yield higher corporate taxes. In the basic specifications, a 10 percent point increase in the real non-energy commodity price index is expected to yield tax increases of between 0.3% and 0.45% of GDP for MICs and LICs with an additional enhancement if the real exchange rate depreciates. When tax indicators are included and more of the observations are from the past two decades, the non-energy commodity price index has smaller positive impacts expect for UMICs, but the real exchange rate depreciation adds significantly to the impact. Amongst HICs, commodity prices had a negative impact on taxes, which indicates these commodity prices were raising costs of doing business and lowering taxable income.

When the impacts of the tax rate indicators are included in the results presented in Table 7.3 and Table 7.5, the trade tariff rate only has a significant positive relationship among LMICs. In fact, among LICs, higher trade tariffs indicate lower taxes. This may well imply that LICs with high import tariffs also have high import exemptions that more than offset the high import duty rates.

The domestic tax rate indicator (a combination of income tax and consumption tax rates) shows stronger explanatory power amongst LICs and MICs than the three domestic tax rate indicators specified separately, but the opposite is the case for HICs. An increase of 1.2 in the domestic tax rate indicators is about equivalent to an increase of one percentage point in the rates for all of the CIT, top PIT and VAT/GST. The impact is particularly strong for LICs resulting in an increase in tax of 0.87% of GDP. The estimated effects of the tax rate indicators for MICs and LICs are shown separately in Table 7.4. This shows that the VAT/GST rate is largest and significant for LICs and LMICs, and is only somewhat smaller than the CIT rate impact for UMICs. Amongst HICs, the VAT/GST rate stands out as significant and also as much larger in magnitude than the effects of PIT and CIT rates on taxes.

The other main points of interest that arise out of the results in Table 7.1 and Table 7.3, are the regional impacts on tax performance. The major points of interest are that among LICs and MICs, Sub Saharan African countries typically show tax performance of around 5% of GDP above the residual countries. Latin American countries are above the residual group in LICs, but markedly below in UMICs. Former USSR transitional countries are typically about 8% above the residual group, and European MICs are some are 11 to 12% above, but this impact drops off particularly for European UMICs once tax rate indicators are included.

The regional effects are particularly important among the HICs because here the level of tax collection is more a function of policy choice rather than constrained by the structures of an economy such as large informal sectors and weak tax compliance and administration capacity amongst LIC and LMICs. In addition, the range of GDP per capita is huge at about \$100,000 compared to only about \$1,000 among LICs. Higher income levels do not necessarily lead to higher tax revenue outcomes. Aside from excluding the very high income oil revenue dominated countries (RG1), as discussed in section 5 and the tables in that section, there are some HICs with significantly above average incomes left in the sample, namely, Luxembourg, Norway and Switzerland. Dummy variables are included to check whether their revenue performance differs from what would otherwise be expected from them in terms of income level, region, tax indicators, etc. Interestingly, Switzerland collects about 7% below expectation once tax rates have been included in Table 7.3. This lower collection is somewhat offset by the collections of the average European HICs of about 5% of GDP above the residual HICs once tax rate indicators are taken into account. By contrast, Norway collects about as expected of a European country. This indicates that it has not cut back on tax revenue collections despite its large non-tax oil revenues, which are then largely

channeled into a sovereign wealth fund rather than being taken as the basis for a reduction in current taxes. East and Southeast Asian HICs show collections about 3% below the residual countries before taxes are taken into account in Table 7.1, but this difference disappears when tax rates are taken into account in Table 7.3 largely because these have low VAT/GST rates of about 10%. Nevertheless, small Asian HICs (Hong Kong, Macau and Singapore) still collect some 10% of GDP or more below the residual countries after taking tax rates into account.

7.3. Determinants of revenue capacity

The next set of estimations gives the determinants of the domestic revenues. Many studies stop at the point of estimating just government taxes or, as above, taxes plus social security contributions, but here the non-tax revenues are included in order to cover the total domestic revenues. This is in line with the interest in knowing the domestic resource mobilization capacity and performance of a country. Importantly, non-tax revenues, which are a potential substitute for tax revenue in the previous estimations now becomes part of the dependent variable being estimated. Table 7.6 gives the results of the estimations of domestic revenues as a share of GDP for both basic specifications and ones including domestic tax rate indices or tax rate indicators. Table 7.7 shows the impacts of changes in the determinants on the domestic revenues as a share of GDP.

Generally, the results in Table 7.6 for domestic revenues are consistent with those in Table 7.3 for taxes (including SSC) with a few notable exceptions. First, the impact of general revenues over central revenues is higher which would reflect the common case of subnational governments making relatively higher use of non-tax user charges. Among LICs, the difference is about 5% of GDP, among MICs and HICs about 8% of GDP. Second, the impact of increases in real GDP per capita among LICs is higher which implies that non-tax revenues are rising as a share of GDP along with taxes. To achieve an increase of one percentage point of GDP in domestic revenues would take about an increase in per capita GDP of only about \$160 compared to about \$250 per capita to increase taxes by 1% of GDP. Third, the substitution impact of increased external grants is much higher on domestic revenue than on tax collections. Finally, among HICs, Norway has domestic revenue of about 11% of GDP higher than the average European country, which largely reflects its large receipts of non-tax oil revenues

Table 7.6: Determinants of Domestic Revenue as share of GDP (%) by income class, basic and tax rate indicator specifications for sample period

Explanatory variables	LICs		LMICs		UMICs		Explanatory variables	HICs	
	<i>Basic</i>	<i>Tax rate index</i>	<i>Basic</i>	<i>Tax rate index</i>	<i>Basic</i>	<i>Tax rate index</i>		<i>Tax rate index</i>	<i>Tax rates</i>
GDP per capita (constant 2010 USD)	0.006 <i>(2.835)***</i>	0.006 <i>(2.170)**</i>	0.001 <i>(2.112)**</i>	0.001 <i>(2.171)**</i>	-0.0001 <i>(-0.342)</i>	0.0002 <i>(1.422)</i>	GDP per capita (constant 2010 USD)	-0.00002 <i>(-0.390)</i>	0.00001 <i>(0.185)</i>
General government revenue data	4.31 <i>(2.704)***</i>	5.06 <i>(2.929)***</i>	2.53 <i>(1.873)*</i>	7.48 <i>(8.153)***</i>	2.43 <i>(1.682)*</i>	8.46 <i>(3.874)</i>	General government revenue data	7.47 <i>(1.707)*</i>	8.01 <i>(1.858)*</i>
							Norway	14.95 <i>(4.258)***</i>	10.99 <i>(3.502)***</i>
Sub-Saharan African country	-3.95 <i>(-1.482)</i>	-15.28 <i>(-4.298)***</i>	3.16 <i>(0.989)</i>	1.6 <i>(0.599)</i>	6.97 <i>(1.522)</i>	4.10 <i>(1.198)</i>	Luxembourg	2.19 <i>(0.530)</i>	1.96 <i>(0.471)</i>
South Asian country	-6.86 <i>(-2.146)**</i>	-20.96 <i>(-3.445)***</i>	-7.43 <i>(-2.084)**</i>	-5.53 <i>(-1.980)**</i>	-	-	Switzerland	-6.61 <i>(-2.565)**</i>	-2.54 <i>(-0.758)</i>
Latin American country	-9.92 <i>(1.584)</i>	-22.97 <i>(-4.739)***</i>	-5.79 <i>(3.657)***</i>	-2.07 <i>(-0.785)</i>	-3.78 <i>(-1.178)</i>	-12.33 <i>(-4.894)***</i>	Small Asian HICs: Singapore, Hong Kong, Macau	-9.90 <i>(-6.560)***</i>	-10.83 <i>(-12.27)***</i>
East and Southeast Asian country	-6.81 <i>(-1.864)*</i>	-23.35 <i>(-2.284)**</i>	-2.63 <i>(-0.832)</i>	-3.68 <i>(-1.231)</i>	-3.55 <i>(-0.898)</i>	-9.99 <i>(-3.235)***</i>	East and Southeast Asian country	-3.49 <i>(-1.454)</i>	-0.88 <i>(-0.421)</i>
Former USSR transitional country	-1.24 <i>(-0.257)</i>	-	1.26 <i>(0.333)</i>	7.46 <i>(0.932)</i>	5.48 <i>(1.240)</i>	-3.66 <i>(-1.097)</i>	Former USSR transitional country	0.69 <i>(0.177)</i>	-1.568 <i>(-0.367)</i>
European country	-8.03 <i>(-2.031)**</i>	-	6.29 <i>(1.788)*</i>	1.86 <i>(0.521)</i>	9.06 <i>(2.236)**</i>	-1.89 <i>(-0.558)</i>	European country	6.84 <i>(2.972)***</i>	3.38 <i>(1.306)</i>
Working age population ratio	-0.169 <i>(-1.152)</i>	0.21 <i>(0.424)</i>	0.0467 <i>(0.293)</i>	0.0281 <i>(0.162)</i>	-0.0615 <i>(-0.224)</i>	0.153 <i>(0.460)</i>			
Grants	0.045 <i>(0.942)</i>	0.541 <i>(2.597)***</i>	-0.209 <i>(-0.977)</i>	-0.737 <i>(-2.246)**</i>	-0.489 <i>(-1.379)</i>	-0.551 <i>(-2.220)**</i>			
	0.066	0.161	0.0171	0.089	-0.0214	-0.025			

Goods imports to GDP	(2.116)**	(1.489)	(0.570)	(2.827)***	(-1.037)	(-0.715)			
Agricultural value-added to GDP	-0.084 (-1.235)	-0.179 (-1.709)*	-0.208 (-1.967)**	-0.052 (-0.320)	-0.163 (-0.806)	-0.189 (-0.784)			
World non-energy commodity price index (2010=100, real 2010 USD)	0.041 (2.088)**	-0.027 (-0.772)	0.046 (1.826)*	0.035 (1.054)	0.043 (2.714)***	0.045 (2.475)**	World non-energy commodity price index (2010=100, real 2010 USD)	0.016 (1.363)	
Real exchange rate index (D\$/US\$, PPP 2010)	0.0009 (6.815)***	0.040 (2.502)**	0.018 (2.656)***	0.038 (1.317)	0.0102 (0.946)	0.023 (1.660)*			
Trade weighted import tariff rate		-0.038 (-0.710)		0.152 (1.275)		-0.027 (-0.360)	Corporate income tax rate	0.095 (1.829)*	
							Personal income tax rate	0.070 (1.904)*	
							VAT/GST rate	0.550 (3.479)***	
Domestic tax rate indicator		0.380 (1.248)		0.221 (1.408)		0.030 (0.205)	Domestic tax rate indicator	0.246 (3.446)***	
Composite Country Risk Indicator		0.008 (0.0804)		-0.006 (-0.0750)		0.092 (1.052)	Composite Country Risk Indicator	-0.028 (-0.408)	-0.004 (-0.0576)
Constant	20.78 (3.281)***	-2.694 (-0.0928)	14.94 (1.796)*	-4.688 (-0.329)	28.71 (1.789)*	5.333 (0.213)	Constant	20.300 (3.163)***	14.550 (1.997)**
Observations	905	81	674	157	400	197	Observations	418	418
Number of countries	56	15	62	26	41	29	Number of countries	39	39
Rwithin	29%	22%	26%	37%	11%	23%	Rwithin	21%	25%
Rbetween	68%	92%	49%	73%	47%	56%	Rbetween	66%	74%
Roverall	61%	80%	40%	70%	46%	55%	Roverall	58%	71%

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 7.7: Estimates of impacts on Domestic Revenues as share of GDP (%) of selected explanatory variables based on estimation models in Table 7.5

Explanatory variable	Size of change in explanatory variable	Specification	LICs	LMICs	UMICs	Specification	HICs
GDP per capita (constant 2010 USD)	100	<i>Basic</i>	0.63	0.12	-0.01	<i>Tax rate index</i>	-0.002
		<i>Tax rate index</i>	0.56	0.12	0.02	<i>Tax rates</i>	0.001
General government revenue data	1	<i>Basic</i>	4.3	2.5	2.4	<i>Tax rate index</i>	7.5
		<i>Tax rate index</i>	5.1	7.5	8.5	<i>Tax rates</i>	8.0
Grants	1%	<i>Basic</i>	0.04	-0.21	-0.49		
		<i>Tax rate index</i>	0.54	-0.74	-0.55		
Goods imports to GDP	10%	<i>Basic</i>	0.658	0.171	-0.214		
		<i>Tax rate index</i>	1.61	0.885	-0.253		
Agricultural value-added to GDP	10%	<i>Basic</i>	-0.837	-2.08	-1.63		
		<i>Tax rate index</i>	-1.79	-0.516	-1.89		
World non-energy commodity price index (2010=100, real 2010 USD)	10	<i>Basic</i>	0.41	0.46	0.43		
		<i>Tax rate index</i>	-0.27	0.35	0.45		
Real exchange rate index (D\$/US\$, PPP 2010)	10	<i>Basic</i>	0.01	0.18	0.10		
		<i>Tax rate index</i>	0.40	0.38	0.23		
Domestic tax rate indicator	1.2	<i>Tax rate index</i>	0.46	0.10	0.003	<i>Tax rate index</i>	0.30
Corporate income tax rate	1%					<i>Tax rates</i>	0.10
Personal income tax rate	1%					<i>Tax rates</i>	0.07
VAT/GST rate	1%					<i>Tax rates</i>	0.55

7.4. Impact of mining sector

A large mining sector is expected to be a positive tax handle given both the presence of large formal sector corporations (often multinationals) and the possible access to the appropriation of significant share of potentially large natural resource rents through taxes, royalties and possibly dividends where the state owns a significant share (if not all) of the mining companies. Given mining revenues can be earned as both tax and non-tax revenue, to estimate the full impact of the mining sector it is best to estimate the impact of mining value-added as a share of GDP on domestic revenues rather than tax revenues. As already noted

above, large non-tax revenues may result in lower tax effort in general in a country aside from the possibility of the mining revenues themselves being received more as non-tax than tax revenues. In fact, when mining value added as a share of GDP is included as a determinant of taxes as share of GDP, increased mining value-added among LICs results in a significant *reduction* of about 0.8% of GDP in taxes per 1% of mining value-added in GDP, but does result in increases of 0.1 to 0.4% of GDP in taxes among LMICs and UMICs.

Table 7.8 gives the estimations of the determinants of domestic revenues as a share of GDP from LICs, LMICs and UMICs in similar specifications to Table 7.6 for the specifications including the tax rate index, but here it includes the mining value added as a share of GDP. These specifications explain between 64% and 87% of the variability of the domestic revenues across countries in these three income groups. If mining value added as a share of GDP is 10 percentage points higher in a country, domestic revenues are expected to be about 6.1% of GDP higher among LICs, 3.9% higher among LMICs and 0.8% among UMICs.

It is also notable in these specifications that the impacts of higher domestic taxes rate are significant for especially for LICs with an increase of 1.2 in the index resulting in an increase of 1% of GDP in domestic revenues.

Table 7.8: Determinants of Domestic Revenue as share of GDP (%) by income class, tax rate indicator and mining value added specifications for sample period

Explanatory variables	LICs	LMICs	UMICs
GDP per capita (constant 2010 USD)	0.004 (1.376)	0.001 (2.254)**	0.00018 (1.095)
General government revenue data	5.62 (4.252)***	7.49 (7.263)***	6.90 (3.434)***
Sub-Saharan African country	-0.486 (-0.0521)	3.51 (0.918)	3.87 (1.483)
South Asian country	-12.76 (-1.415)	-1.09 (-0.204)	-
Latin American country	-12.46 (-1.261)	2.01 (0.358)	-11.30 (-4.766)***
East and Southeast Asian country	-26.03 (-3.181)***	-1.16 (-0.262)	-10.44 (-4.319)***
Former USSR transitional country	-	10.84 (1.274)	-2.88 (-0.935)
European country	-	5.53 (0.858)	-1.47 (-0.624)
Working age population ratio	0.96 (2.934)***	0.05 (0.322)	0.34 (1.551)
Grants	0.668 (3.380)***	-0.611 (-1.399)	-0.175 (-0.693)

Goods imports to GDP	0.217 <i>(2.018)**</i>	0.090 <i>(2.583)***</i>	-0.033 <i>(-1.080)</i>
Agricultural value-added to GDP	-0.254 <i>(-2.519)**</i>	-0.018 <i>(-0.109)</i>	-0.240 <i>(-1.188)</i>
Mining value-added to GDP	0.610 <i>(1.891)*</i>	0.385 <i>(0.833)</i>	0.076 <i>(0.600)*</i>
World non-energy commodity price index (2010=100, real 2010 USD)	-0.063 <i>(-2.291)**</i>	0.018 <i>(0.795)</i>	0.039 <i>(1.756)*</i>
Real exchange rate index (D\$/US\$, PPP 2010)	0.031 <i>(1.985)**</i>	0.030 <i>(1.257)</i>	0.031 <i>(1.903)</i>
Trade weighted import tariff rate	-0.035 <i>(-0.492)</i>	0.152 <i>(1.463)</i>	0.019 <i>(0.309)</i>
Domestic tax rate indicator	0.842 <i>(3.072)***</i>	0.295 <i>(2.019)***</i>	0.054 <i>(0.500)</i>
Composite Country Risk Indicator	-0.094 <i>(-1.012)</i>	0.022 <i>(0.445)</i>	0.166 <i>(1.786)*</i>
Constant	-64.07 <i>(-2.504)**</i>	-13.99 <i>(-1.013)</i>	-12.86 <i>(-0.785)</i>
Observations	73	156	176
Number of countries	15	26	29
Rwithin	20%	40%	27%
Rbetween	97%	73%	62%
Roverall	87%	72%	64%

Robust z-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

7.5. Tax and domestic revenue effort

Based on the estimates of the determinants of tax including SSC and domestic revenues using both the basic specifications in Table 7.1 and Table 7.3 and the specifications including tax rate indicators or indexes in Table 7.3 and Table 7.6, the estimates of tax and domestic revenue over GDP for each country can be made for the years from 1987 through 2014 where the data required for the determinants are available. These estimated tax over GDP and domestic revenues over GDP are referred to as the tax and domestic revenue capacities of the country given their economic characteristics, economic conditions and tax policy choices that the country in its income class is expected to be able to achieve. The tax and domestic revenue capacity is then compared to the actuals achieved 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 actual domestic revenue of the country in the year. The results presented and discussed here focus on the LICs and MICs, which are the primary concern in the context of enhancing domestic revenue mobilization, but some results are also provided for HICs at the end.

7.5.1 TE and RE over time by income class

Figure 7.1 gives the TE and RE for the average country in each income class over time from 1987 through 2013 based on the basic specifications for 105 LICs and MICs. These graphs generally show a similar patterns of effort for both taxes and domestic revenues within an income class. In addition, TEs and REs typically show declining performances up to the early 1990s, and then show recoveries starting either in the late 1990s or early 2000s before the negative impact of the great recession in 2008-09 and subsequent recovering in TE and RE, particularly by the LICs and LMICs. Overall, after 1990, the UMICs showed higher TE and RE than the LICs, which are consistently lowest performers, but their efforts do rise sharply at the end after 2010. The graphs for the combined LICs and MICs show an “average” performance with the clear decline in performance through the early 1990s and the subsequent recovery prior to the trough caused by the great recession. Overall, these patterns of early decline are likely to have arisen through the combined effects of declining real world commodity prices as discussed in section 5 as well as by the effects of declining trade taxes as countries adopted lower tariff protection on imports. Some countries had difficulties in replacing these forgone import duties with domestic tax revenues. Interestingly, while changes in real GDP pc, and real commodity and exchange rates were included in the estimations, these only partially captured the structural and cyclical effects over this time period.

Figure 7.1: Tax and domestic revenue efforts over 1987-2013 for average country in income category for basic specifications

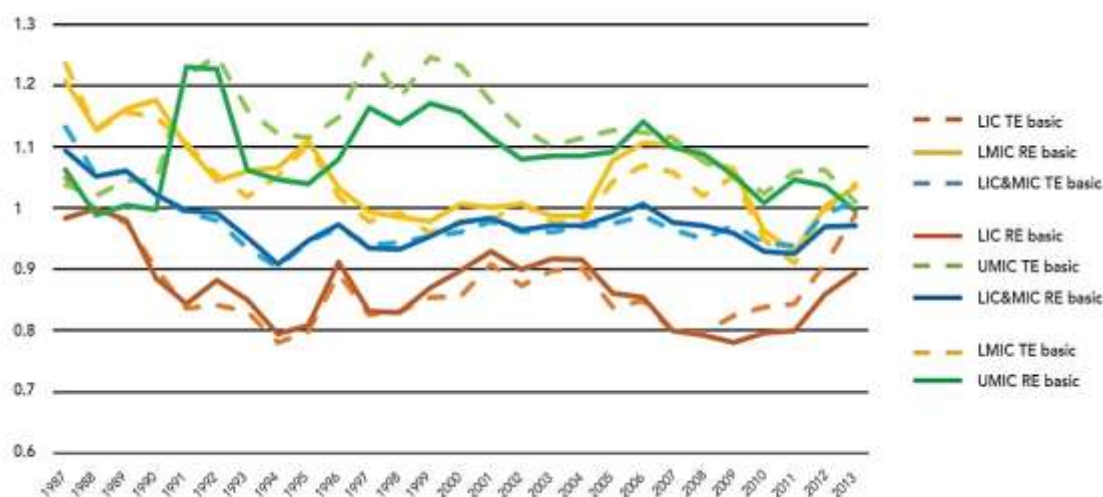
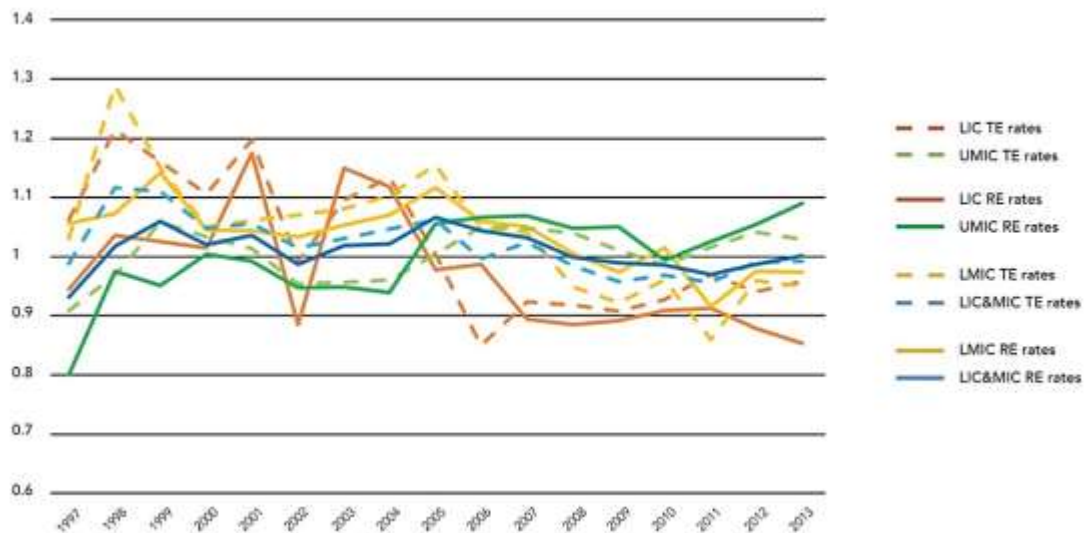


Figure 7.2 presents the TE and RE in a similar fashion, but here the tax and domestic revenue capacities are estimated using estimation specifications including indicators of import tariffs and domestic tax rates over 1997-2013 for 55 LICs and MICs. Importantly, these country samples are smaller compared to those in basic specifications shown in Fig 7.1 as they are restricted to countries with known tax rate information. In addition to fewer countries remaining in the sample, the data is mainly for years from 1997 onwards. The estimates of tax and domestic revenue capacity are also “rebased” in these specifications because of the different country samples, years and determinants included in the specifications.

Figure 7.2 shows greater overlap between the TE and RE graphs for the different income groups. Over this period, the highest performances are around 2004-06, which declines around the great recession of 2008-09. UMICs generally show an improving performance over time whereas LICs and to lesser extent LMICs tend to show a declining performance.

The other comparison of the two sets of estimates of TE and RE for countries (LICs and MICs) is that the variation in the estimates of tax and revenue capacity are higher using the basic specification compared to the specification including tax rate indicators as the share of the variation in tax and revenue performance is higher in these specifications. The average standard deviation of estimates of TE or RE for a country using the basic specification is 0.13 whereas for estimates based on specifications using tax rate indicators the average standard deviation drops to around 0.07. Typically, the standard deviations are slightly higher for LICs than for UMICs. See Table A 5.2.

Figure 7.2: Tax and domestic revenue efforts over 1987-2013 for average country in income category for tax rate indicator specifications



In general, estimates of TE and RE based on more complete specification including tax rates give a better estimate of the revenue performance. 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 as side from further improvements in collection efficiency or rationalizing tax expenditures.

7.5.2 TE and RE by country

Table 7.9 lists the estimates of the average TE and domestic RE for 105 low and middle-income countries based the basic specifications for estimating the tax and domestic revenue capacities of

countries by income class as shown above. The results are listed by declining RE.⁴² About 50 countries have either TEs or REs of 1 or above. Of the remaining countries, 37 countries have efforts of at least one standard deviation of the average country RE below 1 (or below 0.87.) Some countries with higher RE values may still have low TE values. For a low-income country that has a TE of 67%, for example, and an estimated tax capacity of 15% of GDP, then this implies that it has a shortfall of some 5% of GDP in tax revenue. In any particular country case, more careful scrutiny of the feasible tax base, taxpayer compliance capacity, tax policies and tax expenditures would be needed to judge whether the collection of the full short fall would be feasible assuming the country had the political will to do so.

Inspection of the RE and TE results shows that the difference between these effort estimates or (RE – TE) is small in most cases. Some 65 out of the 105 countries have differences of 0.1 or less. In addition, most differences are negative. This is the case for some 70 out of the 105 countries, while for a limited number countries RE exceeds TE by a large margin. Table A 5.3 shows that these countries with high positive excess RE over TE are all resource dependent counties (see also Table A 5.1) that have high non-tax revenues mostly in excess of 5% of GDP. This emphasizes the need to estimate the domestic revenue capacity of these countries with specifications including their mining sector value added as a share of GDP as illustrated in section 4 and Table 7.8 above. By contrast, countries with (RE-TE) deficits, typically had low non-tax revenues below 5% of GDP and often much lower (at less than 2% of GDP).

Table 7.10 presents the TE and RE for countries based on tax and domestic revenue estimates that include tax rate indicators. This results in the number of low and middle-income countries with data to be included in these capacity estimations being reduced to 55 countries and the period with observations largely from 1987 onwards. The explanatory power of these estimations is significantly higher so that the range of TE and RE estimates are lower. Nevertheless, some 29 of the 55 countries have either TE or RE over 1 with the remainder lower than 1. In addition, 20 countries have RE estimates below 0.93, which is one standard deviation of the average country estimate of RE below 1. Similar to the results based the basic specifications for capacity estimates, some resource dependent countries have RE estimates significantly higher than their TE estimates, namely, Botswana, Bulgaria, Columbia, Russia, Sudan, Tunisia and Yemen.

Finally, Table 7.11 gives the TE and RE estimates for 38 high-income countries based on capacity estimates including tax rate indicators. Here the standard deviation are low as the share of variation of tax and domestic revenue performance explained is relatively high. Accordingly, the range of the TE and RE values for high-income countries is also lower than for low and middle-income countries. Note that the results in Table 7.11 for the TE and RE estimates for Singapore, Luxembourg, Norway and Switzerland include the impacts of the country dummy variables for these specific countries. If these are removed, RE for Norway would increase to about 1.2 due its large non-tax oil revenues, whereas both TE and RE estimates for Switzerland, and especially, Singapore would drop well below 1. Generally, the TE and RE performances by high-income countries are expected to arise more out of country choices about their tax and revenue

⁴² Note that Lesotho is shown with the highest RE and TE. Lesotho is an outlier internationally its Gross National Disposable Income running about 140% to 230% above its GDP. This implies that its effective tax base is significantly higher than its GDP, and hence, its RE and TE estimates should be adjusted down a factor of about 1.5 to 2 which would bring its TE and RE estimates more in line with South Africa and Namibia.

policies than out of the constraints arising from their economic structures or taxpayer and tax administration capacities.

The next section considers the role of tax expenditures in public policy and revenue gaps as the final piece in the puzzle of understanding government revenue performance and the potential for enhanced domestic revenue mobilization.

Table 7.9: Average Tax Effort (TE) and Domestic Revenue Effort (RE) for LICs and MICs using basic capacity estimates over sample period listed by declining RE estimates

Country	TE basic	Std. Dev	RE basic	Std. Dev	RE basic-TE basic
Lesotho	2.37	0.35	2.18	0.27	-0.20
Equatorial Guinea	1.08		2.15		1.07
Botswana	1.82	0.36	1.83	0.26	0.01
Papua New Guinea	1.77	0.19	1.73	0.15	-0.04
Bhutan	1.18	0.32	1.68	0.40	0.50
Angola	1.86	0.46	1.61	0.32	-0.25
Brazil	1.68	0.07	1.50	0.06	-0.18
Congo, Rep.	0.63	0.16	1.40	0.26	0.77
Namibia	1.57	0.11	1.36	0.08	-0.21
Algeria	0.77	0.17	1.33	0.14	0.56
Belize	1.24	0.08	1.29	0.09	0.06
Swaziland	1.48	0.26	1.28	0.21	-0.19
Russia	1.16	0.24	1.28	0.28	0.12
South Africa	1.43	0.06	1.26	0.06	-0.17
Ukraine	1.25	0.12	1.24	0.11	0.00
Uruguay	1.35	0.08	1.24	0.08	-0.11
Mongolia	1.28	0.16	1.24	0.13	-0.04
Nigeria	0.66	0.16	1.22	0.33	0.55
Estonia	1.26	0.12	1.20	0.09	-0.06
Malaysia	1.11	0.21	1.20	0.20	0.09
Turkey	1.37	0.07	1.19	0.06	-0.18
Guyana	1.18	0.11	1.18	0.16	0.00
Hungary	1.17	0.05	1.17	0.05	0.00
Mauritania	0.93	0.13	1.15	0.18	0.22
Moldova	1.15	0.13	1.15	0.15	0.00
Bolivia	1.19	0.22	1.14	0.21	-0.05
Vietnam	1.12	0.08	1.13	0.07	0.01
India	1.31	0.22	1.12	0.18	-0.19
China	1.29	0.10	1.12	0.06	-0.17
Korea, Rep.	1.15	0.13	1.11	0.09	-0.04

Nepal	1.21	0.15	1.11	0.12	-0.10
Bosnia and Herzegovina	1.10	0.02	1.10	0.02	0.01
Croatia	1.15	0.14	1.09	0.13	-0.06
Montenegro	1.07	0.06	1.09	0.09	0.02
Tunisia	1.34	0.06	1.09	0.07	-0.26
Poland	1.05	0.06	1.08	0.07	0.03
Serbia	1.08	0.06	1.06	0.06	-0.02
Panama	0.92	0.13	1.05	0.16	0.14
Malawi	1.11	0.20	1.03	0.20	-0.08
Jordan	1.08	0.19	1.03	0.11	-0.04
Latvia	1.07	0.06	1.02	0.06	-0.05
Cote d'Ivoire	1.14	0.18	1.01	0.18	-0.13
Czech Republic	1.04	0.03	1.01	0.04	-0.03
Yemen	0.50	0.10	1.01	0.40	0.52
Costa Rica	1.09	0.11	1.01	0.13	-0.08
Morocco	1.30	0.11	1.01	0.08	-0.29
Bulgaria	0.94	0.14	1.00	0.18	0.06
Colombia	0.85	0.13	1.00	0.14	0.15
Lithuania	1.07	0.05	0.99	0.04	-0.07
Trinidad and Tobago	1.18	0.12	0.97	0.08	-0.22
Suriname	0.91	0.22	0.97	0.20	0.05
Burundi	1.08	0.13	0.96	0.12	-0.12
Pakistan	1.01	0.15	0.95	0.16	-0.07
Mali	0.98	0.13	0.95	0.10	-0.03
Togo	1.00	0.18	0.93	0.18	-0.07
Kenya	1.00	0.10	0.92	0.11	-0.09
Chile	0.93	0.07	0.90	0.06	-0.03
Djibouti	1.13	0.06	0.90	0.04	-0.23
Kyrgyzstan	0.82	0.13	0.90	0.12	0.08
Senegal	1.01	0.08	0.90	0.06	-0.11
Honduras	0.87	0.06	0.89	0.06	0.02
Thailand	0.97	0.07	0.89	0.07	-0.08
Macedonia, FYR	0.89	0.11	0.89	0.10	0.00
Mauritius	1.01	0.11	0.88	0.10	-0.12
Benin	0.98	0.11	0.88	0.07	-0.10
Iran	0.47	0.11	0.88	0.23	0.41
Zambia	1.03	0.17	0.87	0.13	-0.16
Nicaragua	0.89	0.06	0.87	0.07	-0.02
Paraguay	0.72	0.11	0.85	0.09	0.13

Philippines	0.86	<i>0.11</i>	0.84	<i>0.11</i>	-0.02
Gambia	0.90	<i>0.03</i>	0.83	<i>0.03</i>	-0.07
Egypt	0.83	<i>0.11</i>	0.83	<i>0.13</i>	0.00
Romania	0.87	<i>0.09</i>	0.83	<i>0.09</i>	-0.04
Afghanistan	0.79		0.83		0.04
Laos	0.74	<i>0.11</i>	0.81	<i>0.09</i>	0.07
Sri Lanka	0.94	<i>0.04</i>	0.81	<i>0.02</i>	-0.13
Indonesia	0.81	<i>0.12</i>	0.80	<i>0.06</i>	-0.01
Cameroon	0.73	<i>0.11</i>	0.80	<i>0.14</i>	0.07
Guinea	0.89	<i>0.11</i>	0.78	<i>0.10</i>	-0.11
Ethiopia	0.77	<i>0.10</i>	0.78	<i>0.11</i>	0.01
Burkina Faso	0.83	<i>0.14</i>	0.75	<i>0.11</i>	-0.08
Lebanon	0.86	<i>0.05</i>	0.74	<i>0.05</i>	-0.11
Kazakhstan	0.79	<i>0.18</i>	0.74	<i>0.14</i>	-0.05
Ghana	0.81	<i>0.12</i>	0.73	<i>0.12</i>	-0.07
Armenia	0.71	<i>0.07</i>	0.72	<i>0.05</i>	0.01
Mexico	0.79	<i>0.06</i>	0.72	<i>0.07</i>	-0.07
Mozambique	0.78	<i>0.21</i>	0.72	<i>0.21</i>	-0.07
El Salvador	0.71	<i>0.05</i>	0.71	<i>0.05</i>	0.00
Sudan	0.47	<i>0.06</i>	0.70	<i>0.28</i>	0.23
Rwanda	0.81	<i>0.09</i>	0.69	<i>0.08</i>	-0.12
Niger	0.75	<i>0.21</i>	0.67	<i>0.18</i>	-0.08
Georgia	0.67	<i>0.23</i>	0.67	<i>0.21</i>	0.00
Central African Republic	0.72	<i>0.10</i>	0.66	<i>0.10</i>	-0.06
Sierra Leone	0.75	<i>0.06</i>	0.66	<i>0.05</i>	-0.09
Albania	0.63	<i>0.09</i>	0.64	<i>0.08</i>	0.01
Chad	0.63	<i>0.37</i>	0.64	<i>0.40</i>	0.01
Guatemala	0.65	<i>0.06</i>	0.62	<i>0.06</i>	-0.03
Cambodia	0.55	<i>0.08</i>	0.61	<i>0.05</i>	0.05
Bangladesh	0.63	<i>0.04</i>	0.60	<i>0.04</i>	-0.03
Madagascar	0.66	<i>0.10</i>	0.56	<i>0.08</i>	-0.09
Uganda	0.64	<i>0.05</i>	0.56	<i>0.05</i>	-0.08
Tanzania	0.62	<i>0.07</i>	0.55	<i>0.07</i>	-0.06
Guinea-Bissau	0.44	<i>0.12</i>	0.55	<i>0.12</i>	0.10
Myanmar	0.24	<i>0.06</i>	0.50	<i>0.14</i>	0.26
Congo, Dem. Rep.	0.32	<i>0.22</i>	0.32	<i>0.23</i>	0.00

Table 7.10: Average Tax Effort (TE) and Domestic Revenue Effort (RE) for low and middle income countries 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
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

Table 7.11: Average Tax Effort (TE) and Domestic Revenue Effort (RE) for high income countries using capacity estimates specifications including tax rate indicators over sample period listed by declining RE estimates

Country	TE basic	Std. Dev	RE basic	Std. Dev	RE basic-TE basic
Finland	1.10	0.03	1.18	0.02	0.08
Denmark	1.14	0.02	1.16	0.02	0.02
New Zealand	1.17	0.07	1.16	0.05	-0.01
France	1.13	0.03	1.14	0.02	0.01
Sweden	1.10	0.04	1.13	0.03	0.03
Austria	1.11	0.02	1.13	0.02	0.02
Belgium	1.12	0.02	1.09	0.02	-0.04
Canada	1.06	0.02	1.08	0.02	0.02
Hungary	1.11	0.06	1.04	0.04	-0.07
Israel	1.13	0.12	1.03	0.10	-0.10
Italy	1.10	0.05	1.03	0.04	-0.07
Germany	0.96	0.02	1.02	0.02	0.06
Estonia	1.08	0.05	1.01	0.05	-0.07
Korea, Rep.	0.97	0.04	1.01	0.03	0.04

Australia	0.98	0.07	1.00	0.06	0.02
Singapore	1.00	0.05	1.00	0.08	0.00
Luxembourg	1.00	0.02	1.00	0.02	0.00
Norway	1.00	0.02	1.00	0.02	0.00
Switzerland	1.00	0.01	1.00	0.02	0.00
Netherlands	0.95	0.03	0.99	0.02	0.04
Iceland	0.93	0.07	0.98	0.07	0.05
Japan	1.02	0.18	0.98	0.17	-0.04
Portugal	0.88	0.02	0.97	0.02	0.09
Cyprus	0.98	0.07	0.96	0.06	-0.02
United States	0.92	0.05	0.96	0.04	0.04
Czech Republic	0.99	0.02	0.96	0.02	-0.03
Greece	0.89	0.03	0.96	0.05	0.06
Slovenia	1.05	0.03	0.94	0.03	-0.10
United Kingdom	0.93	0.02	0.93	0.03	0.00
Poland	0.92	0.01	0.92	0.01	-0.01
Croatia	1.03	0.04	0.91	0.02	-0.12
Spain	0.94	0.05	0.90	0.05	-0.04
Slovakia	0.87	0.02	0.89	0.02	0.02
Malta	0.95	0.03	0.88	0.02	-0.08
Latvia	0.90	0.02	0.87	0.01	-0.04
Lithuania	0.93	0.01	0.85	0.01	-0.08
Ireland	0.76	0.04	0.82	0.03	0.06
Chile	0.82	0.03	0.71	0.03	-0.10

Section 8: Tax expenditures: experience and opportunity

8.1. Introduction

This section provides an overview and assessment of the status of tax expenditures accounting and estimates across countries and over time in terms availability, coverage and comprehensiveness. It reports estimates of tax expenditures that have been collected from various national budget documents and reports of multilateral organizations for their member countries. Although tax expenditures are typically significant, often in the range of 2% to 8% of GDP, tax expenditure reporting is low among many countries, especially among LMICs and LICs. Due to different accounting, definitional and measurement systems used across countries, it is also difficult to make international comparisons on tax expenditures. This section describes some of the tax expenditures concepts and measurement systems that are used by countries for reporting and discusses the different types and estimates of tax expenditures that are publicly available.

8.2. Tax expenditure: policy rationale, concepts and measurement and reporting

Tax expenditures arise from specific policy measures that deviate from the base line tax structure of a country in order to benefit or incentivize specific groups of taxpayers. While definitions of tax expenditures vary somewhat from country to country, tax expenditures generally include “exemptions from the tax base, allowances deducted from gross income, tax credits deducted from tax liability, tax rate reductions, and tax deferrals (such as accelerated depreciation).”⁴³

Tax expenditures have been used by governments as a policy instrument to address various needs. Sometimes it is used to offset a market failure or support access to merit goods, redistribute income, stimulate employment, production, and commonly investments and foreign direct investment flows, and otherwise address the needs of a target population.

One of three methods is generally used to calculate tax expenditures:

- (i) revenue foregone method or initial revenue loss/gain (ex post calculation of the loss in revenue incurred by government which does not account for taxpayer behavioral responses);
- (ii) revenue gain method/final revenue loss/gain (ex-ante calculation of the additional revenue that would accrue from repealing tax expenditures which takes taxpayer behavior in to account⁴⁴); and

⁴³ IMF Manual on Fiscal Transparency <https://www.imf.org/external/np/fad/trans/manual/sec02a.htm>

⁴⁴ The behavioral impacts or market responses that arise from a change in a tax expenditure provision can have indirect effects within a tax type as well as in other tax types. For example, changes in consumption patterns can result in gains and losses in revenues as the tax base shifts between items that may be taxed at different rates. In the case of income tax investment incentives, aside from the direct changes in the income tax, changes can also arise in indirect and labor taxes as output and employment levels change.

- (iii) the outlay equivalent method (calculates the outlay that would have resulted in a similar gain for the taxpayer as the considered tax expenditure).^{45,46} The first approach of revenue forgone is the most common way tax expenditures accounts are reported, whereas method two should be used at the point of introducing, amending or evaluating a specific tax expenditure measure. Importantly, tax expenditures estimates are made on a marginal or one-measure-at-time basis rather than an aggregate basis. If all tax expenditures were to be eliminated altogether, then the economic structure could be changed in a radical way and the effective tax rates on the measures could also be different from the marginal ones, particularly for tax expenditures in a personal income tax with increasing marginal tax rates. tax expenditures accounts are often reported on cash flow basis (or change in the tax flows caused by the tax expenditures measure), but can also be reported on an accrual or change in the present value of taxes caused by the tax expenditures measure. Awareness of the differences in the TE accounts is particularly important where tax expenditures measures affect the timing of tax payments such as tax deferrals in investment incentives or tax-deductible pension savings.⁴⁷ Cash flow tax expenditures accounts are important in medium term fiscal planning, but accrual or change in present value measures are critical in assessing the long run costs of a tax expenditures deferral measure.

Ideally, tax expenditures accounts should be based on the detailed tax returns of taxpayers as opposed to indirect estimates of what the assumed usage of a TE measure may be in a country. This is important to have credible tax expenditures estimates that could predict the expected change in taxes if a measure is removed or modified. When based on actual detailed tax returns it is likely the added taxes indicated by the tax expenditures accounts could actually be collected if the measure is removed rather than a possibly exaggerated estimate of what is potentially collectable.

The measurement and reporting of tax expenditures can help to quantify revenue losses, estimate potential revenue gains from elimination, and make decisions on if and how direct government spending can better address the objectives.⁴⁸ tax expenditures are an important component of revenue and tax structures and directly affects a country's fiscal balance, resource prioritization, allocation, and effectiveness.⁴⁹ For these reasons, it is usually recommended to report tax expenditures in the budget or alongside budget outlay programs to evaluate tradeoffs and policy choices.

Reporting of tax expenditures, therefore, can help enhance fiscal management, help make informed policy decisions regarding the best tools to deliver policy objectives, and help in improving overall tax policy principles through rigorous and transparent review and analysis. Tax expenditures are policy induced tax gaps. Earlier in this report they are described under Gap 3 in Section 3. tax expenditures are generally

⁴⁵ Brixi, H. P., Valenduc, C. M., & Swift, Z. L. (Eds.). (2003). *Tax Expenditures--Shedding Light on Government Spending through the Tax System: Lessons from Developed and Transition Economies*. The World Bank.

<https://openknowledge.worldbank.org/handle/10986/15067>

⁴⁶ OECD, *Tax Expenditures in OECD Countries* (2010) <http://www.oecd.org/gov/budgeting/taxexpendituresinoecdcountries-oecdpublication.htm>

⁴⁷ A simple example of the difference between cash and accrual accounting is where tax, t , is deferred for one year. In year zero, there is a reduction in tax collections of t but an increase in year one of t . On accrual basis, the TE cost is $t*r$ in year zero or the interest cost of financing the one year deferral (where r is the governments cost of capital finance.)

⁴⁸ Trigueros, M. P. (2014). Tax Expenditures in Latin America http://www.un.org/esa/ffd/wp-content/uploads/2015/03/2015TIBP_CIAWp02-2014.pdf

⁴⁹ Swift, Z. L. (2006). Managing the effects of tax expenditures on national budgets. The World Bank. <http://documents.worldbank.org/curated/en/602361468341100836/pdf/wps3927.pdf>

considered to be policy instruments vulnerable to policy pressures by narrow interest groups when they are not transparent and not subject to full budget scrutiny when they are established and/or sustained over the long-term. A lack of tax expenditures accounting and scrutiny opens the door to inefficient policies and even corruption. While some tax expenditures are sound public expenditures, many are excessive, redundant, inefficient, and unanalyzed. Although often the motivation of using tax expenditures is to incentivize investment, assist vulnerable groups, support pension savings, etc, the impact of tax expenditures on revenue mobilization is not clear and can cause large wasteful revenue losses. Like direct expenditures, tax expenditures may be economically justifiable or not (“good” or “bad”), but in either they case should be costed, scrutinized and accounted for.

8.3. Estimates of tax expenditure: overview of reporting

Given the potential large impact of tax expenditures on revenue performance, the IMF, World Bank and OECD have recommended countries to publish tax expenditures estimates. While OECD countries like Germany and the United States published their first tax expenditures report in the 1960s, tax expenditures estimates are hard to find and are not reported in a consistent manner by most developing and emerging economies where they are available. While data on OECD countries are available from the early 1990s, reporting by most other countries only started in the last decade. Although countries like Brazil have published tax expenditures reports since 1989, regular tax expenditures reports for Latin American countries started only in the late 2000s.⁵⁰ India started reporting tax exemptions in the Statement of Revenue Foregone for the first time in the 2006-07 Union Budget.⁵¹

TEs for Latin American and Caribbean countries are collected and published by the Inter American Center for Tax Administration since 2008.⁵² Such regional efforts to collect tax expenditures data are not seen in other regions. While most OECD countries produce both estimates and projections of tax expenditures, most developing countries and transition economies produce partial estimates, while other countries do not provide any estimates.⁵³ Among low and middle income countries, International Budget Partnership’s Open Budget Survey reports that Argentina, Chile, Columbia, Dominican Republic, Guatemala, India, Jamaica, Jordan, Kenya, Lebanon, Malaysia, Morocco, Nepal, Pakistan, Peru, Philippines, Russia, Serbia South Africa, Sri Lanka, Tanzania, Trinidad and Tobago undertakes tax expenditure reporting. As per the Open Budget Survey 2015, 47 out of 102 surveyed countries met minimum tax reporting thresholds with information on policy rationale, beneficiaries and estimates of revenue foregone. Only 13 of these countries published all of the core information for all of the country’s tax expenditures.⁵⁴

For most countries, available tax expenditures estimates are mostly at the central or federal government level, although some countries like the US also publish sub-national tax expenditures reports at the state government level. For example, the Revenue Research Division of the North Carolina Department of Revenue has published Biennial Tax Expenditure Reports every two years from 2007 through 2017. Similarly, in Canada provincial governments may report T tax expenditures. For example, Ontario has

⁵⁰ Trigueros, M. P. (2014) op cit.

⁵¹ This has been renamed as “revenue impact of tax incentives” since 2015-16 after formation of the new Modi government.

⁵² Trigueros, M. P. (2014) op cit.

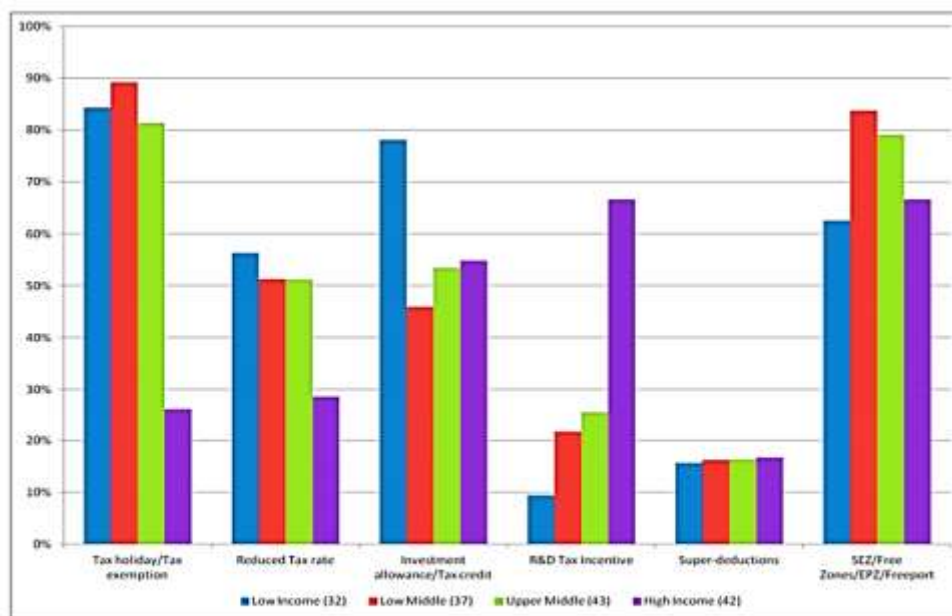
⁵³ Swift, Z. L. (2006) op cit.

⁵⁴ International Budget Partnership, 2018. *Shedding Light on Spending Through the Tax Code* <https://www.internationalbudget.org/2018/01/shedding-light-on-spending-through-tax-code/>

reported TEs at least since 2016.⁵⁵ As noted earlier, for HICs, central government revenue only covers about two-thirds of general government revenues. This implies that to get a full picture of the extent of tax expenditures in an economy, tax expenditures accounts are also required to subnational governments. While the missing subnational tax expenditures estimates are likely to be relatively less important for LICs, LMICs and UMICs, tax expenditures accounts only for central or federal governments is only gives a partial picture of the forgone revenues in the economy.

Tax expenditures are targeted at many groups, sectors and market activities, but income tax-based investment incentives have been a major area in recent decades. A 2015 IMF report, titled “Options for Low Income Countries’ Effective and Efficient Use of Tax Incentives for Investment,” summarizes the number of countries and different types of tax incentives used by countries. Figure 8.1 below shows the share of countries using various income tax incentives. As per the IMF report, while HICs use tax incentives for tax credits on investment and promotion of research and development, MICs use preferential tax zones, while LICs offer tax holidays and reduced tax rates.⁵⁶

Figure 8.1: Percentage of countries by income class using different types of income tax investment incentives



/1 Figure shows the percent of countries in each of four income groups that have the indicated incentive. The sample size per income group is denoted between brackets.

Source: Calculations based on James (2014)

⁵⁵ Ontario Ministry of Finance, Transparency in Taxation, 2017, <https://www.fin.gov.on.ca/en/budget/fallstatement/2017/transparency.html>

⁵⁶ IMF (2015) “Options for Low Income Countries’ Effective and Efficient Use of Tax Incentives for Investment <https://www.imf.org/external/np/g20/pdf/101515.pdf>

8.4. Estimates of tax expenditure: actual reports captured

This study collected existing central government tax expenditure estimates reported by various countries from different country tax documents and reports. 247 estimates were collected covering 57 countries over a period from 2000 mostly for OECD countries and from mid-2000s for most other countries.⁵⁷ The results are in Table 8.1. These central government estimates usually pertain to income taxes, both personal and corporate taxes, VAT or GST, and custom duties. Some countries have also reported tax expenditures related to equity taxes, social security contributions, and certain special taxes on sectors such as fossil fuel or carbon. There are differences in measurement and inclusions and exclusions. Few, if any country covers all tax types and within tax types there can be gaps in coverage. For example, with the income tax a country may omit reporting the taxes forgone by preferential tax treatment of pension savings or receipt of social security benefits, which can be major tax expenditure items. The details of inclusions and exclusions in the tax expenditure estimates are mostly available for the OECD countries and to some extent for the Latin American country data available in Inter-American Center of Tax Administrations (CIAT) reports. Most data are reported in government budget documents, usually published by the ministry of finance or treasury departments of the countries. Data for some LICs are also found in reports published by independent researchers and NGOs.

Table 8.1 summarizes the size of tax expenditures of countries by income groups in two ways: (i) tax expenditure as a share of GDP and (ii) tax expenditure as a share of central government revenue. The first gives a first cut perspective on the size of the forgone revenues, but it is an underestimation. The degree of underestimation arises from the omission of subnational tax expenditures and the incomplete coverage of many accounts in terms of tax types not included or types of tax expenditure excluded. The second measure attempts to correct for the omission of subnational tax expenditures by comparing the tax expenditure estimates with only the central government tax revenues can be well below 50% of general government revenues, whereas in unitary states central government revenues could be as much as 90% of general government revenue.

The average tax expenditure to GDP estimates for countries by income class are:

- HICs, 6.0% (+/- 4.3%),
- UMICs, 4.4% (+/-2.3%),
- LMICs, 3.8% (+/-1.9%) and
- LICs, 5.8% (+/-2.1%).

The average tax expenditures to central government taxes by income class are:

⁵⁷ The coverage of this survey of reported tax expenditure accounts attempted to be as broad as possible, but it was limited to reports available to the authors or published on the internet by national governments or by international organizations. While tax expenditure accounts exist for a number of countries such as the United States and Canada back to the 1970s, these are not readily available without added research efforts of government documents. This study also limited itself to tax expenditure accounts reported in English. More government accounts are available on line than are reported by international organizations, but these would require translation in order to be included in this study. No attempt was made to compile the tax expenditure accounts published by subnational governments. The existence of some subnational government accounts in the US and Canada, for example is noted.

HICs, 33.0% (+/- 25.5%),

UMICs, 23.5% (+/-12.1%),

LMICs, 26.4% (+/-16.8%) and

LICs, 48.0% (+/-13.3%).

The reported TE over GDP and TE over tax are the highest for HICs at 6% and 33% and then decline to 3.8% and about 25%, respectively, for LMICs. The HICs also show the highest variability in reported tax expenditures ranging from a low for Germany at below 1% and about 7%, respectively, and a high for the UK at about 17% and 67%, respectively.⁵⁸ While tax expenditures for LICs are high at 5.8% and 48%, respectively, there is some concern about the comparability of these results given they are based on very few countries and years of observation. In addition, the methodologies behind some results are not transparent so that it is not clear which T tax expenditures are included and in some cases they are based on external estimates rather than derived from actual tax returns. This can lead to overestimates of the actual collectible taxes if the tax expenditures measures are modified.

A number of key results emerge from the actual reported tax expenditures that are important. First, even taking an average tax expenditures over GDP of about 4% and tax expenditures over tax revenue of about 25%, it is clear that the accounting and potential reform of tax expenditures offers significant scope for enhancing domestic revenues. This is especially so at the level of general government revenue when it is recognized that most tax expenditures estimates are understated because of omitted tax types, tax expenditures items and subnational government tax expenditures.

Second, both the significant size of tax expenditures and their significant variation across countries within income classes suggests that if a more comprehensive set of data on tax expenditures was available, particularly for LICs and MICs, that T tax expenditures would be able to account for a significant share of the unexplained variation in tax capacity across countries.

Third, internationally the reporting of tax expenditures accounts is very patchy and incomplete. While some OECD HICs have reported TE accounts regularly for many years, aside from CIAT reporting tax expenditures accounts for Latin American countries, no other international organization is collecting and publishing tax expenditures accounts on a routine annual basis. This is clear gap in the basic data that is needed to understand the opportunities for LICs and MICs to enhance their domestic revenues. Greater effort is also needed by regional and international organizations to work with all countries to improve the coverage of their tax expenditures accounts in terms of tax types, tax expenditures items and levels of government as well to gain regular reporting and aggregation of this key development indicator.

Fourth, it is important to recognize that the mere reporting of tax expenditures is not sufficient to achieve more economically efficient and more cost effective tax system. Considerable effort is required in any country (i) to identify all tax expenditures and (ii) decide upon the accounting approaches to be used, (iii) to amend tax forms and tax information systems to collect the data necessary to estimate the tax expenditures, and (iv) to conduct the in depth tax analysis required to form the basis of decisions to

⁵⁸ Canada actually shows the highest average TE over central taxes at 72%.

introduce or modify or reduce a tax expenditures measure. Not all large tax expenditures are necessarily “bad.” They could be the most efficient and effective way to deliver some benefit. This is often the case with “income-tested” benefits where the income tax provides the necessary data and machinery to target and deliver the benefit. It can also be the case, however, that tax expenditures items can be poorly targeted and result in large tax losses without gaining any or sufficient incremental benefit. This is often the case with tax-based investment incentives. The bottom line is that there is no way around the conduct of careful tax and economic analysis to justify a particular tax expenditures item.

Table 8.1: Tax expenditures by central governments expressed as shares of GDP and central government taxes for selected years for selected countries by income class

Country	TE over GDP		TE over Central Govt Taxes (including SSC)		Year range	Comments		Source
	Average	SD	Average	SD		Omitted major tax type	Omitted tax expenditures items	
HICs								
Argentina	2.5%		19.8%		2014	Customs	Personal deductions (medical expenses, education or dependents)	<i>CIAT Tax Studies and Research Directorate</i>
Australia	8.6%	1.3%	37.5%	3.4%	2005-2015			<i>Tax Expenditure Statement, Treasury</i>
Belgium	6.2%	1.4%	25.1%	6.6%	2005-2015	PIT, CIT, Excise, VAT, Withholding of income and movable property		<i>Federal Tax Expenditures reports, Ministry of Finance</i>
Canada	10.4%	0.6%	71.6%	7.1%	2001-2009	Excise and customs		<i>Tax Expenditures in OECD Countries, 2010</i>
Chile	4.4%	0.1%	24.9%	1.2%	2012, 2014-2015	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Denmark	2.4%	0.2%	7.9%	1.2%	2000-2008	PIT, CIT, VAT, Excise, Real Estate, Inheritance		<i>National Report on Tax Expenditures, Denmark, Nordic Tax Research Council, 2012</i>
Estonia	1.8%		6.5%		2012	IT, VAT, Alcohol, Fuel, Electricity Excise		<i>Estonia Stability Programme 2012</i>
Finland	7.6%	0.5%	34.8%	3.0%	2000-2008	PIT, CIT, VAT, Social Security, housing		<i>Tax Expenditures in the Nordic Countries, 2010</i>

Germany	0.7%	0.1%	6.6%	0.8%	2005-2008	VAT, Excise, Customs		<i>Tax Expenditures in OECD Countries, 2010</i>
Ireland	11.3%	3.4%	49.5%	19.6%	2004-2016	PIT, CIT, customs, VAT, Stamps		<i>Office of Revenue Commissioners, Irish Revenues and Customs Statistics</i>
Spain	5.3%	0.7%	59.4%	17.3%	2008-2009	Customs	Tax on capital transfers and documented legal acts (stamp duty), the tax on inheritance and gifts, and the general indirect tax, tax on real estate administered by local governments	<i>Tax Expenditures in OECD Countries, 2010</i>
United Kingdom	16.9%	0.2%	64.5%	0.3%	2006-2007			<i>Tax Expenditures in OECD Countries, 2010</i>
Korea, Rep.	2.5%	0.0%	17.1%	0.8%	2006-2007	Excise, customs		<i>Tax Expenditures in OECD Countries, 2010</i>
Netherlands	1.9%	0.1%	8.7%	0.2%	2006-2012	Customs	Social security premium for employers and employees	<i>Tax Expenditures in OECD Countries, 2010</i>
Uruguay	6.4%	0.1%	29.8%	6.9%	2012-2014	Customs		<i>CIAT Tax Studies and Research Directorate</i>
United States	6.4%	0.4%	63.7%	5.8%	2002-2014	VAT, Excise, Customs		<i>Tax Expenditures in OECD Countries, 2010</i>
HIC AVERAGE	6.0%	4.3%	33.0%	22.5%	2000-2016			
UMICs								
Argentina	2.4%	0.3%	16.2%	3.7%	2008-2012, 2015	Customs	Personal deductions (medical expenses, education or dependents	<i>CIAT Tax Studies and Research Directorate</i>

Brazil	3.4%	0.9%	25.3%	8.0%	2008-2012, 2014-2015	Customs		<i>CIAT Tax Studies and Research Directorate</i>
Bulgaria	0.6%	0.1%	2.2%	0.3%	2007-2009	PIT, CIT, VAT, Excise		<i>Tax Expenditure report, Bulgaria Ministry of Finance</i>
Chile	4.7%	0.5%	27.0%	3.5%	2008-2011	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Colombia	2.2%	1.4%	17.0%	8.9%	2008-2013	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Costa Rica	5.4%	0.2%	30.3%	7.1%	2010-2012, 2014-2015	Customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Dominican Republic	5.9%	0.7%	43.0%	3.5%	2008-2016	Customs	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Ecuador	4.5%	0.3%	25.8%	1.0%	2009-2014	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Gabon	5.1%		22.0%		2011			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
Grenada	8.1%		46.4%		2009			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
Jamaica	5.9%		24.5%		2013			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
Jordan	8.9%	2.4%	47.7%	3.1%	2010, 2012, 2014			<i>USAID-funded Fiscal Reform II Project, Evaluating Tax Expenditures in Jordan</i>
St. Kitts and Nevis	6.0%		27.1%		2009			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>

St. Lucia	7.9%		32.7%		2009			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
Mexico	3.7%	0.6%	24.1%	3.3%	2008-2012, 2014 - 2016	Customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Panama	2.3%		12.4%		2012			<i>CIAT Tax Studies and Research Directorate</i>
Peru	2.0%	0.2%	12.0%	1.9%	2008-2012, 2014-2016	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Paraguay	1.8%	0.1%	14.0%	1.2%	2014-2016			<i>CIAT Tax Studies and Research Directorate</i>
Turkey	1.3%		7.3%		2015-2016			<i>Ministry of Finance report</i>
Uruguay	6.0%	0.4%	21.9%	1.4%	2008-2011	Customs	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
South Africa	3.7%	0.2%	13.7%	0.7%	2008, 2013-2016			<i>National Treasury document</i>
UMIC AVERAGE	4.4%	2.3%	23.5%	12.1%	2000-2016			
LMICs								
Bolivia	1.2%	0.2%	4.8%	4.8%	2011-2013	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Ecuador	4.2%		28.3%	28.3%	2009	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Ghana	6.3%	1.2%	44.6%	44.6%	2010-2011, 2013			<i>OECD, Tax and Development program, 2013. Analysis of TE in Ghana</i>
Guatemala	6.0%	2.9%	54.5%	54.5%	2008-2015	Customs	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Honduras	6.3%	0.2%	39.3%	39.3%	2011-2012	Customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
India	5.3%	1.3%	57.6%	57.6%	2007-2016	GST		<i>Ministry of Finance Revenue Foregone reports</i>

Morocco	3.9%		16.8%	16.8%	2013			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
Nicaragua	5.1%	0.4%	29.8%	29.8%	2011-2013	Customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Pakistan	1.6%	0.5%	16.5%	16.5%	2009-2015	Excise		<i>Economic Survey, Pakistan and Study on Tax Expenditures in Pakistan, 2014 World Bank</i>
Philippines	1.4%	0.1%	10.9%	10.9%	2011-2015		Only includes investment incentives	<i>Government budget document</i>
Paraguay	1.9%	0.1%	14.9%	14.9%	2008-2010	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Senegal	3.8%		21.2%	21.2%	2009			<i>Government document</i>
El Salvador	3.4%	0.0%	21.9%	21.9%	2010, 2012	Excise, customs, equity	Social security contributions	<i>CIAT Tax Studies and Research Directorate</i>
Tunisia	2.2%		8.5%	8.5%	2009			<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
LMIC AVERAGE	3.8%	1.9%	26.4%	16.8%	2001-2013			
LICs								
Burundi	10.0%				2006			<i>North South Institute, 2010</i>
Ethiopia	4.5%		57.7%		2007	Only based on trade taxes		<i>Revenue Mobilization, Case Study of Ethiopia, Tsegabirhan</i>
Ghana	5.2%		42.3%		2009			<i>OECD, Tax and Development program, 2013. Analysis of TE in Ghana</i>

Guinea	4.4%		28.7%		2011	<i>Tax and Non-Tax Incentives and Investments: Evidence and Policy Implications, World Bank 2013</i>
India	6.0%		54.3%		2006	GST <i>Ministry of Finance Revenue Foregone reports</i>
Tanzania	5.0%		59.9%		2006	<i>OECD, Tax and Development program, 2013. Analysis of TE in Ghana</i>
LIC AVERAGE	5.8%	2.1%	48.6%	13.1%	2006-2011	

Section 9: Summary and Conclusions

9.1. Background

The MDGs for 2000-15 and now the SDGs for 2015-30 highlight the need for significant enhancement in the financial support for countries to achieve these goals. The need for significant increases in domestic revenues is most evident in LICs, in particular, as well as MICs to finance the public sector outputs needed to advance towards achieving the SDGs. This study provides a broad-based cross-country analysis of the constraints and opportunities for enhanced domestic revenues.

In Section 2, the study recognizes the rapidly changing context for domestic revenue mobilization in developing countries, particularly since 2000, to achieve enhanced public sector service delivery. Most important is the upward mobility of many countries to higher income classes. For example, in 1980, LICs had 47.7% of the world population, which then fell to 41% by 2000 and then dropped sharply to only 8.7% by 2015. In 2000, there were 63 LICs, but only 31 by 2015. Similarly, MICs went from having 44.5% of the world population in 2000 to 75.2% in 2015. Many countries have graduated from LIC to LMIC and LMIC to UMIC. The “depopulation” of the LIC class was dominated by upward mobility of the large countries with India and Indonesia moving up from LIC to LMIC, and China moving all the way up from LIC to UMIC. Many other countries in Africa and Asia have graduated from LIC to LMIC and many, particularly in Latin America, moved up from LMIC to UMIC. Chile moved up all the way to HIC. This upward mobility of countries has reduced many of the structural constraints and allowed significant increases in DRM, on average⁵⁹.

Accompanying the upward mobility of countries over the past two decades has been a significant increase in real official development assistance (ODA) with Development Assistance Committee (DAC) member countries more than doubling their real net ODA from a low in 1997 through 2017. This increase in net ODA has also been accompanied by a growth in the number of non-DAC members providing development assistance as well as growth in the amount of assistance they provide. This growth in countries providing ODA reflects the increase in numbers of UMICs and HICs that are now also providing assistance. In addition, there has been real growth in assistance from international non-governmental organizations. If more of the growing ODA flows are targeted at the LICs and LMICs, then enhanced growth, DRM and public services can be expected from these countries over future years assuming this aid is effectively used for investment in institutional, human and physical capital.

This study does not address the core issue of the budgeting and governance constraints in many lower income countries that limit their abilities to transform added revenues into incremental public services. Where these constraints are severe, added DRM will not readily translate into added public sector outputs that would support SDGs. Clearly, it is key in such constrained countries for financial assistance (both ODA and domestic revenues) to be directed at the capacity building required both to deliver services and to

⁵⁹ WDI of government revenues as a share of GDP for the world as a whole indicates some small increases from about 21% of GDP in the 1970s to over 23% since the 1980s and over 24% since 2014. This data may be affected by changing coverage of government from mainly central to more general coverage. It is also important to recognize that as income levels rise some countries may decide not to expand revenues as fast as the growth in real per capita income.

raise domestic revenues ahead of any expectation that enhanced DRM is achievable to support major gains in achieving all or targeted SDGs.

9.2. Results of study

The study of comparative cross-country tax and revenue capacity, effort and opportunities is based the ICTD's GRD that covered available government revenue data for countries over 1970-2014. After excluding eight oil-revenue-dominated countries and 46 small islands and countries, the study database focused on 155 countries with 4,347 country-years of observations. The study took four related approaches:

- i. It analyzed the differences in average revenue types between countries in different income classes and regional groups and over time.
- ii. It compared the average values of the determinants of taxes and revenues between the countries in the income classes and regional groups and over time.
- iii. It estimated the determinants of revenues and taxes of countries within the income classes.
- iv. It analyzed available estimates of the tax expenditures across the countries over time.

In combination, these approaches allowed a determination of (i) whether membership of an income class or regional group had significant explanatory power; (ii) which explanatory variables were significantly different between the country income classes and regional groups; (iii) which explanatory variables were significant in explain differences in tax capacity within the country income classes and what has been the relative tax effort of individual countries relative to their comparator countries with an income class; and (iv) what is the magnitude of tax expenditures for the countries with available data and what is its likely importance in explaining the unexplained remaining differences in revenue performance across similar countries.

Aside from the direct results achieved through these four sets of revenue and tax analysis, the study also serves to identify the issues and weaknesses in the data that should ideally be available to conduct more rigorous and fruitful studies.

9.2.1 Group tax and revenue performance trends and differences

In section 5, the study shows that there are significant revenue and tax performance differences between income classes and between some regions, and that this performance is fairly stable over time with some small systematic changes over time relating to changing macro environments. At the same time, within each of these country income classes there is a large variation in revenue performance with standard deviations varying only from 7.6% to 9.6%. It is this within group variation that the tax capacity analysis aims to explain.

Overall, Table 5.2 shows that, on average, domestic revenues increase by 9.8% of GDP from LIC to LMIC, 5.0% of GDP from LMIC to UMIC, and 9.6% of GDP from UMIC to HIC with most of the increase coming from taxes (including SSC.) When the increase in domestic revenue is related to the actual increases in the average per capita GDP between the income classes (see Table 5.3 for the GDP per capita in constant 2010 US\$ for the country groups), then the increment of domestic revenue per \$1,000 increase in GDP per capita is 4.1% of GDP from LIC to LMIC, but drops to 0.9%

of GDP per \$1,000 from LMIC to UMIC and further to 0.3% of GDP per \$1,000 from UMIC to HIC. This emphasizes the importance of GDP growth to increasing the domestic revenues among LICs. All components of domestic revenue (taxes, SSC and non-tax revenue) increase with income level, but SSC contributions grow the most from 0.3% of GDP for LICs to 6.3% of GDP for HICs. (SSC also shows a high increase in variability with a standard deviation that grows with income level but it falls relative to the mean SSC.) The biggest single source of revenue increase comes from a 5.9% of GDP increase in tax revenue (and 9.8% of GDP in domestic revenue) between LICs and LMICs. This shows the critical importance of growth and economic development relaxing the structural constraints on revenue collections in LICs and LMICs.

Given the income classes contain countries for which only the central government revenue are available, the average adjustment was estimated for each income class to assess the revenues expected if all countries reported general government revenues. These adjustments to domestic revenues as a share of GDP were fairly similar increments across income classes: LICs, 1.8%; LMICs, 2.9%; UMICs, 1.8%; and HICs, 1.5%. While only 24% of LICs reported general revenues, central government revenues generally formed 86% of general revenues. By contrast, 93% of HICs reported general revenues, but central government revenues only formed 64% of general revenues.

Regional country groupings show revenue performances that are largely in line with their average income levels with two notable exceptions. First, Eastern Europe shows a similar revenue performance to Other Europe despite having a much lower GDP per capita. Second, East and Southeast Asia has had revenue collections much lower than expected in terms of its GDP per capita. The variability of revenue performance within regions is generally similar to that within income classes with the exception of Sub Saharan Africa, which has a much higher standard deviation in its domestic revenues at 11.2% of GDP than any other regional grouping.

When the trends in decade-by-decade domestic revenues are analyzed by income class and region, with a few exceptions, a pattern of remarkable stability in the average revenue performance emerges within these groups. Some of the exceptions include increases in performance within the LICs and UMICs, but decreases within the HICs. It is unclear though whether these results are affected by the changing membership of countries in these groups over time as the number of LICs have declined while the number of UMICs and HICs have increased. The country groups have more stable membership over time. Amongst these, South Asia, Sub Saharan Africa, East and South East Asia and Latin America all show some improvements in revenue performance. Linear trend analysis of the annual data generally confirms these results, but the upward trends are generally weaker in Sub Saharan Africa and Latin America. Closer analysis of the shapes of the annual revenue performance reveals that, aside from Other Europe that has "maximum" revenues around 2006, a low or "minimum" revenue performance is arises for resource dependent countries in Sub-Saharan Africa, East and South East Asia, Latin America and among the transitional countries of the former USSR. This minimum typically falls in mid to late 1990s or early 2000s, which corresponds to the low in real world commodity that occurred in the late 1990s before the rapid prices starting around 2003.

9.2.2 Differences in average values of determinants of revenue performance across country income classes and groups

The comparison of country group averages of key determinants of the tax and revenue capacity of countries proved to be important given the weak and patchy nature of the information for many countries, particularly LICs and LMICs. Subsection 3 below elaborates on these data weaknesses and issues. Here some illustrative highlights of the major differences in factors affecting the tax capacity of economies are provided.

Table 9.1 provides some macroeconomic indicators by country income class for the post 2000 years in the data sample. Comparing LICs with HICs, huge gaps emerge. GDP per capita goes from \$745 up to \$40,034. Net secondary income (largely aid transfers and remittances) in LICs averaged 9.9% of GDP compared to -0.5% of GDP in HICs. LICs have a smaller share of 54.7% their population in the working ages (15-64 or potential taxpayers) compared to 67.6% in HICs. LICs had higher and more unstable inflation rates at 57.6% compared to only 2.4% for HICs. Consequentially, LICs also experienced higher real depreciation in their currencies at 44.8% compared to 5.8% by HICs after 2000.

Table 9.1: Economic structure (selected macro variables) by countries in income classes and in sample periods after 2000

		GDP per capita (constant 2010 US\$)	Net secondary income/GDP (%)	Working age population (15- 64) over population (%)	Real LCU /US\$ PPP exchange rate index, 2010=100	Inflation, consumer prices (annual %)
LIC	Mean	745	9.9	54.7	144.8	57.6
	SD	430	17.2	4.9	488.2	1042.9
	Observations	568	555	568	522	549
	Countries	58	57	58	53	56
LMIC	Mean	3,028	7.9	62.4	118.7	8.1
	SD	1,526	8.2	5.8	27.3	11.6
	Observations	486	473	494	435	463
	Countries	68	65	69	61	64
UMIC	Mean	8,464	2.4	66.3	112.5	6.6
	SD	3,069	4.2	3.8	21.9	6.7
	Observations	385	370	385	319	364
	Countries	50	48	50	43	48
HIC	Mean	40,034	-0.5	67.6	105.8	2.4
	SD	19,096	1.4	3.1	16.5	1.9
	Observations	476	467	476	270	476

Countries	43	42	43	28	43
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Source: World Development Indicators, UN data

Table 9.2 focuses on indicators of the relative size of the informal sectors across country income classes, large informal sectors forming a major structural barrier to taxpayer identification and tax assessment and collection. LICs have large shares of agricultural sector value added and high rural population shares averaging 31% of GDP and 68.3% of the population, while HICs only have 2.2% of value added in agriculture and 22.5% of the population is rural. The share of employment that is formally employed is a major facilitator of payroll and personal income tax collections. LICs averaged only 17.6% of the working age population in paid employment and had compensation that only formed 30.6% of GDP compared to HICs with 48.2% of paid employees on average that earned 64% of GDP. Estimates of the shadow economy averaged 40.2% of GDP for LICs, but dropped to 17.8% for HICs.

Table 9.2: Indicators of informal (hard to tax) and formal sectors by countries in income classes and in sample periods after 2000

		Agricultural value added/ GDP (%)	Rural population share (%)	Paid employed labor force/ working age population (%)	Compensation of employees/ GDP (%)	Shadow economy/ GDP (%)
LIC	Mean	31.0	68.3	17.6	30.4	40.2
	SD	<i>11.1</i>	<i>12.4</i>	<i>11.4</i>	<i>20.9</i>	<i>9.2</i>
	Observations	545	568	121	203	363
	Countries	57	58	40	35	54
LMIC	Mean	13.2	48.1	29.0	47.9	38.5
	SD	<i>6.5</i>	<i>16.7</i>	<i>7.9</i>	<i>21.3</i>	<i>12.4</i>
	Observations	464	493	291	276	257
	Countries	67	68	54	51	49
UMIC	Mean	6.5	33.7	38.0	59.8	31.3
	SD	<i>3.3</i>	<i>15.9</i>	<i>8.0</i>	<i>24.4</i>	<i>9.6</i>
	Observations	380	385	324	277	183
	Countries	49	50	47	45	32
HIC	Mean	2.2	22.5	48.2	64.0	17.8
	SD	<i>1.7</i>	<i>12.6</i>	<i>7.5</i>	<i>24.3</i>	<i>6.2</i>
	Observations	454	453	465	460	237
	Countries	42	41	41	43	34

Source: World Development Indicators, UN Data, ILO, Schneider et al

Finally, Table 9.3 compares the educational attainment of the adult populations of countries by income class. These are indicators of the capacity of taxpayer to comply with taxes, particularly more complex taxes such as the income tax and VAT/GST. LICs have low levels of adult literacy at 54.8% compared to HICs at 97.9%. This corresponds to a poor school performance in LICs with 43.6% having no primary education, only 46.2% completing primary school, and 4.7% with any post-

secondary education. By contrast, for HICs, 2.2% of adults have no primary education, 94% have completed primary school, and 25.3% have some post-secondary education.

These comparisons of average explanatory variables across income classes show the major structural constraints and weaknesses for revenue mobilization for LICs compared to countries with higher per capita incomes. Clearly, growth and development of economies is the major driver to achieving the structural economic changes and the human and institutional development that facilitate and make feasible higher revenue efforts.

Table 9.3: Educational attainment of adult population (25 years and older) by countries in income classes and in sample periods after 2000

		Adult literacy rate (%)	Adult primary completion rate (%)	Adult population with no schooling (%)	Adult population with post-secondary education (%)	Adult population with post-secondary education excluding short cycle tertiary (%)
LIC	Mean	54.8	46.2	43.6	4.7	4.0
	SD	23.7	30.2	26.5	5.0	4.8
	Observations	86	31			
	Countries	49	20	19	19	19
LMIC	Mean	83.9	68.8	12.4	12.7	10.8
	SD	14.9	20.1	16.1	10.0	7.8
	Observations	100	91			
	Countries	45	35	28	28	28
UMIC	Mean	94.0	84.3	8.6	15.2	11.9
	SD	5.3	11.4	8.9	10.7	6.5
	Observations	94	127			
	Countries	37	38	32	32	32
HIC	Mean	97.9	94.0	2.2	25.3	19.6
	SD	1.9	7.4	3.3	10.2	10.0
	Observations	27	172			
	Countries	12	32	55	55	55

Source: World Development Indicators, UNESCO Institute for Statistics, February 2016

9.2.3 Determinants of tax capacity and effort within and between countries in income classes

A suite of regressions was run to explain the tax (including SSC) and domestic revenue capacity for countries in each of the four income classes. See section 7. Two sets of estimation were conducted. First, the “basic” set which focuses on the economic structures, regional and general economic characteristics. In a second set, tax rate indicators are added that significantly increase the explanatory power of the estimations from around 40-60% up to 60-80%, but also significantly reduce the number of countries and years that can be used in the estimations, mainly to higher

income countries and to more recent decades for which data are available. Similar data availability problems arise with other key determinants such as formal labor force, educational attainment, size of shadow economy, etc. Some of the general results are summarized here:

- (i) The impact of general government revenues as opposed to only central government adds from 4-5% of GDP in domestic revenues for LICs up 7-8% of GDP for HICs.
- (ii) Added non-tax revenues and added grants tend to lower domestic tax and domestic revenue efforts, particularly among middle-income countries.
- (iii) The importance of estimating tax capacity separately by income class is clear in the cases of the impacts of GDP per capita (positive), share of agricultural value added (negative), goods imports as a share of GDP (positive) and domestic tax rate indicator (positive) in that the impacts of these determinants within the income classes tend to decline moving up from LICs to HICs.
- (iv) Generally increases in the real world non-energy commodity price index and real devaluation of the domestic currency are positively related to improved domestic revenues.
- (v) Mining value added as a share of GDP has a strong positive relationship with domestic revenues especially among LICs. It can be negatively related to tax revenues in cases where the mining profits are mainly taken as dividends rather than added taxes.
- (vi) The VAT/GST rate indicator shows up as the most important among HICs, but the overall domestic tax rate indicator performs better than separate tax rate indicators among LICs and MICs and has the largest impact among LICs. Note that VAT /GST rates have some consistent patterns across groups: high among HICs (close to 20%), around 15% for most developing and emerging economies, but low at 10% for most East and South East Asia economies.
- (vii) Regional indicators are generally negative for East and South East Asia and for South Asia, but positive for Europe and Sub Saharan Africa (except for LICs)

When tax efforts (TE) and revenue efforts (RE) are estimated for average countries in income classes over time, then the general pattern of low TE and RE values in the 1990s, followed by increasing values in the 2000s up to the Great Recession when they decline before recovering somewhat.

Country TE and RE estimates are found for 105 low and middle-income countries using the basic estimations of tax and revenue capacity. When tax rate indicators are included, then estimates are only found for 55 countries. Some 36 of the 105 countries have REs at least one standard deviation below unity based the basic estimates, and some 20 of the 55 countries have REs at least one standard deviation below unity based the estimates including tax rate indicators. These countries form an initial target list for seeking improved revenues through higher tax rates, reduced tax expenditures, enhanced administration and/or enhanced non-tax revenues depending upon what a more detailed analysis of the country revenue context. Some countries with high REs may have TEs well below one, and hence, could target enhancing the tax component of their revenue mix. By contrast, countries with TE values well above one are unlikely candidates for enhance revenue mobilization unless significant political will exists for expanded public sector expenditures *and* low cost revenue expansion opportunities can be identified.

At an individual country level, the difference between TE and RE estimations are generally small, except for resource dependent economies where RE tends to exceed TE by large gaps. This emphasizes the need to estimate the revenue capacity and effort for resource dependent countries rather than the tax capacity and effort. This is consistent with point “v.” above. Some of these countries have RE values well above one, but TE values well below one. This indicates that they have significant potential to expand revenues from taxes if their non-tax revenue yields decline.

Overall RE and TE estimates for a country provide a useful starting point in considering the likely prospects for revenue enhancement opportunities. It is important to recognize that they are limited by the data availability across comparator countries and much is noted in this report about the issues of data omissions or errors in measurement. In any particular country case, more careful scrutiny of the feasible tax base, taxpayer compliance capacity, tax policies, tax expenditures and non-tax revenue options would be needed to judge whether significant revenue enhancement would be feasible assuming the country had the political will to do so.

9.2.4 Tax expenditures: magnitude, coverage and analysis of revenue opportunities

This study attempts to consolidate much of the published country estimates of their tax expenditures, typically in a tax expenditure account accompanying the annual budget of the country. Based on average values of tax expenditures over GDP for 57 countries publications largely since 2000 (see Table 8.1), the average for all income classes is about 5% and most countries (40 out of 57) fall within a standard deviation between about 2% and 8% of GDP. The average values for the countries in each of the income classes are surprisingly close (HICs 6.0%; UMICs 4.4%; LMICs 3.8% and LICs 5.8%). Given the tax yield across countries tend to decline as country income levels fall, it is not surprising that the highest tax expenditure to central government tax revenues occur for the LICs (HICs 33.0%; UMICs 23.5%; LMICs 26.4% and LICs 48.6.1%). The variation in all countries’ tax expenditure to central government tax revenues estimates is captured by a standard deviation of 18.1%. Generally, tax expenditures over GDP are very high and indicate a significant potential loss of tax revenue, and accordingly a key concern in domestic resource mobilization.

As discussed above in Section 8 and again below in subsection 3.6, tax expenditure accounts are far from comprehensive or routine accounts in the budget reports of countries. Gaps tend to exist in the levels of government reporting, the coverage of the tax expenditure in terms of both tax types and tax expenditure items included and the years reported. Here only central government TEs are recoded and compared with central government revenues, but clearly the tax expenditures to GDP estimates would rise where a country has significant reliance on subnational revenues and these subnational taxes may also contain significant tax expenditure. The other source of variance and outliers in cross-country estimates is the coverage of the tax expenditure. Some countries focus on tax incentive measures, exclude some tax types such as customs measures, or omit major sources of tax expenditure such as the tax treatment of pension and social security benefits.

Ideally, the tax expenditures as a share of GDP would be an important determinant of the tax and revenue capacities of a country, especially given that some 20% to 40% of the variation in tax and

revenue performances of LICs and MICs remain unexplained even after tax rate indicators are included. It is clearly important to establish whether high tax expenditures to GDP are closely correlated with low tax and revenue efforts and vice versa. Unfortunately, TE/Y data is not available for many countries, especially in the lower income countries. tax expenditures to GDP estimates have been located for only 6 LICs and 14 LMICs. In addition, estimates are often only for a limited number of years and even then, do not cover all tax types, all levels of government and all tax expenditures. It is expected that, because of these limitations, that full TE/Y estimates for countries would be higher than the reported amounts.

Other aspects of the importance of studying the role of tax expenditures for LICs and MICs include (i) the analysis of tax expenditures to identify cost ineffective tax expenditures, and (ii) the relationship of tax expenditures to the negative impact of foreign grants on tax revenues. It is likely that countries may well use incremental tax expenditures as a mechanism to implement partial tax revenue substitution for increased and sustained flows of grants. Tax expenditures data for LICs and MICs would need to be enhanced to investigate this relationship.

Possibly the most important finding of this report is that a major component of any DRM enhancement strategy should include improved tax expenditures reporting, analysis and elimination of cost ineffective tax expenditures. This especially true for aid dependent countries. It is also important to recognize that improved tax expenditures reporting requires major reforms and improvements in the tax administration reporting systems to capture the tax return details required and in the tax analysis capacity of the Ministry of Finance tax policy unit both to measure the TEs and to analyze the cost effectiveness of all major tax expenditures. Importantly, these enhance capacities to support tax expenditures accounting and analysis should also have complementary benefits of strengthening tax administration efficiency and effectiveness and the capacity to analyze and forecast all types of tax revenues.

9.3. Data issues and gaps

This study is constrained by the weaknesses in many key indicators that help explain the revenue performance. Ironically, the same lack of data limits the effectiveness of tax administration to identify and assess taxpayers. Moreover, the data weaknesses are typically greatest among the lower income countries, which also have the greatest need to enhance their domestic revenue capacities. Some pointers are provided here to data issues and gaps that could be useful addressed in the future.

9.3.1. GDP and GDP per capita

The measurement of GDP in lower income developing countries faces severe challenges given the difficulties to measure the contributions of informal and subsistence sectors and the limited statistical collection resources. The issues include the rebasing of GDP as missing (often new) sector value added is identified with major delays as an economy transforms (and new products and services enter the market place.) GDP deflators often also have to be re-estimated even where real GDP has been estimated reasonably well. As a result, current and historical GDP figures have to be adjusted. Sometimes these adjustments to nominal GDP are very large, 30% and even higher. In addition, since the adoption of 1993 SNA, it is no longer clear to what extent different countries are including the non-monetary subsistence sectors and other parts of the non-observed

economy in their GDP estimates.⁶⁰ Earlier some countries had explicit separation of their monetary and non-monetary GDP estimates, which is important where the subsistence agricultural sector could be large share (greater than 5% of GDP) and include a large share of the population. Ideally, indications of the share of GDP and the population involved in the various non-observed economy that are actually included in the GDP estimate of a country would assist cross country comparisons of revenue capacity. Revenue mobilization depends upon the monetary part of the economy and is also considerably more effective in the formal monetary component. If the non-monetary subsistence sector is excluded from the GDP estimate, then the GDP is a better estimate of the potential tax base, but the GDP per capita is underestimated to the extent the capacity to pay taxes of the population active in the monetary sector is actually higher than when the population operating outside of the monetary sector remains included in the population count. If the non-monetary subsistence sector is included from the GDP estimate, then the revenue-to-GDP estimate would underestimate the actual tax effort the country is making to collect taxes out of its monetary GDP. More detail on the composition of GDP estimates and the activities of the population would enhance the understanding of tax capacity both within and across lower income countries.

9.3.2. Labor force data

Labor force and employment compensation data are other key data for estimating tax capacity that are typically incomplete for lower income developing countries. Employment compensation of the paid employees is a key component in the total value added of an economy. It has also been the backbone of effective taxation in industrial economies through payroll and personal income tax withholding at source by employers out of the high share of the value added earned by this formally employed labor. Ideally, this data should be collectable in most economies, but employment compensation is not generally available. Table A 4.5 and Table 9.2 show that, after 2000 for LICs, less than 40% of the country-years reported employment compensation, though this figure is an improvement over the less than 15% reporting before 2000. The reporting of the number of paid employees in labor force statistics is even weaker for LICs, with less than 20% reporting after 2000 and only about 10% before. Where data is weak for the formally employed in a country, it can also be expected that the statistics on the self-employed labor force are much weaker. While about 100 countries report the share of employment that is self-employed, this is mainly HICs with about 10% self employed, some MICs with about 30% to 50%, and very few LICs falling in the 50% to 90% range.⁶¹ Similarly, nearly all countries report the share of their population in rural areas, only about 115 (again mainly HICs and some MICs) can report the share of total employment that is in the agricultural sector. With rapid urbanization over recent decades, the more challenging part of the self-employed is the share of the non-agricultural employment that is self-employed, particularly if is informal. While self-employed professionals, for example, are less challenging to tax administration, the informal self-employed are a large and major challenge

⁶⁰ As discussed in Section 3, the 1993 SNA includes four components of the Non-Observed Economy, namely (1) *underground production*, (2) *illegal production*, (1 and 2 can be taken as the shadow economy, often cash based), (3) *informal sector production* by unregistered market businesses (often cash based) and (4) *production of households for own final use*, importantly self-supplied agricultural products and housing outside of the market.

⁶¹ The available labor force statistics referred to here are the indicators reported in the World Development Indicators database. It is expected that additional data is available in individual country statistical surveys that has not been included in ILO or WDI databases for various reasons.

to tax administration. As noted in Section 3, Gap 7 arises in part out of unidentified and unregistered businesses largely in the informal urban areas, and in LICs, this could explain a large share of the missing effective tax base. Only about 23 countries (mainly MICs) report the share of non-agricultural employment that is informal, but this share is large at an average of around 50% across the reporting countries. Clearly, improvements in the available data on the composition of rural and urban self-employed labor and well as the value of employment compensation would assist both in the explanation of the constraints on tax capacity and in giving direction to the tax administration efforts.

9.3.3. Educational attainment of adult population

The cross-country comparisons of educational data show stark differences in the education attainment between LICs and HICs as shown in Table 9.3. It is well recognized that general educational skills as well as tax specific skills are crucial to effective taxpayer compliance under self-assessed tax systems. Unfortunately, while in recent decades there has been a strong focus on current school attendance and attainment of the school going age groups, the available statistical data coverage for the adult taxpaying population is still weak. As shown on Table A 4.7 and Table 9.2, data is only available for less than 35% of LICs, and about 40% of LMICs and 65% of UMICs, and often with only intermittent coverage by year. This clearly constrains the ability to explain differences in tax capacity between countries within income classes especially among LICs and LMICs.

9.3.4. Tax administration performance

As discussed in Section 4, there is a lack of comparable indicators across countries on the tax administration performance and capacity. An **index of tax administration performance** could be based on the following six indicators

- (i) the collection efficiency of self-assessed taxes;
- (ii) the ratio of tax arrears to tax assessments (and the share of these arrears arising with state owned enterprises);
- (iii) the ratio of unpaid refunds to the accumulated assessed refundable amounts;
- (iv) the reassessment and adjustments of tax liabilities as a share of tax assessments;
- (v) the ratio employed taxpayers to total employment; and
- (vi) the ratio of registered business taxpayers (other than corporations) as a share of the labor force working in unincorporated business activities.⁶²

An **index of tax administration capacity** could be based on the following three indicators:

- (i) the ratio of tax professional staffing relative to the number of registered taxpayers;
- (ii) the share of tax administration budget devoted to information technology and communications staff, hardware and software; and
- (iii) the tax administration cost of revenues collected relative to the estimated country average determined by the GDP level, population size, and domestic tax rate indicator.⁶³ All levels

⁶² This indicator requires effective collection of data on rural and urban self-employed workers in the economy as discussed above.

⁶³ Estimate administrative cost of revenue collection as a function of population size (or adult population size), GDP (in constant US\$) and domestic tax rate indicator to form the basis identifying any apparent over- or underfunding of tax administration. A non-

of government and taxes (including social security contributions) should be included in the costs and revenues.

9.3.5. Tax rates

Tariff rate data has good coverage for all income groups over recent decades, but import tariff data would be strengthened by including estimates of the uniformity or variability of the tariff rates to get a better understanding of the revenue performance of countries with the same average tariff rate but different dispersions of tariff rates. See Table A 4.12. Domestic tax rate data has also had good coverage especially among OECD member countries and CEPAL member countries in Latin America and the Caribbean. In other regions, the data coverage is patchier unless key rates are captured and reported by one of the major international accounting firms. The data for LICs, in particular, is weak with data for key tax rates available for less than 50% of the countries and less than one-third have all the major rates available. It would be useful if the IMF and/or World Bank assumed the role of capturing key tax rates for all countries.

9.3.6. Tax expenditures

Tax expenditures for all countries represent a major unknown (at best only known for a limited number of mostly HICs) to explain the variations across countries with otherwise similar economic characteristics and tax structures. An OECD report in 2010 only reported on tax expenditure for 10 countries. A more recent report by the European Commission in 2014 indicates some 18-member states keeping regular tax expenditure accounts for direct taxes and a further five making occasional reports, but not all of these were accessible to this study as the budget documents of a number of the countries are not available in English. As indicated in Section 8, a number of other countries over the past decade have started producing more or less comprehensive tax expenditure accounts. In the context of the enhanced DRM, the identification, estimation and analysis of tax expenditure offers a major channel for productive possibilities for incremental DRM. A major international effort is needed to support and possibly require tax expenditure reporting, which will also require building the tax information and analysis systems within tax systems. Tax expenditure accounting efforts would no doubt also have significant byproducts in also supporting more effective tax administration aside from identifying inefficient and ineffective TEs for elimination.

9.4. Some general conclusions

This study exposes a rich knowledge base on the domestic revenue performance of most countries (excluding small islands and countries and oil dependent countries) and the key factors that constrain this performance, particularly amongst LICs and MICs. Nevertheless, the study shows that there are still major knowledge gaps in the explanatory variables of revenue and tax capacity, particularly for LICs and LMICs. There is a need to focus on (i) analysis and measurement of key structures of economy (GDP, self-employed labor force, adult human capacity, tax administration performance and capacity, etc (as laid out in subsection 3 above) in order to understand the constraints on tax types and/or why tax bases are relatively small in LICs and LMICs, and (ii) crucially, tax expenditure accounting and analysis. Another key

linear relationship between the tax administration cost relative to the estimated administration cost is expected with underfunding causing a rapid drop in tax yield, but overfunding is expected to have a declining impact on tax yield.

insight that this study aims to emphasize is the role of the different tax gaps, particularly those arising from the structures of the subsistence and informal sectors in LICs and LMICs (often poorly measured), that drastically constrain the effective tax bases of the country and limit the DRM potential until the economy grows and develops.

The estimation of tax and revenue effort is a useful entry point in understanding the DRM constraints and opportunities of particular countries or groups of countries, but detailed country specific analysis of the economy and tax system in any country is crucial. For resource dependent economies the revenue capacity and effort is the crucial approach, whereas for other economies with more moderate non-tax revenue potential, the tax capacity and effort are the main focus of the analysis of DRM opportunities.

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Annex 1: Background data on changing distribution of population and income over recent decades

Table A 1.1: Distribution of population and GDP by country income class in year 1980, 1990, 2000, 2010 and 2015 for data available in WDI

Group	Tax ex SSC			Social Security Contributions (SSC)			Tax + SSC			Non-tax Revenue			Domestic Revenue		
	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean	Mean (%)	SD (%)	SD/Mean
LIC	11.9	6.1	51%	0.3	1.0	377%	12.2	6.3	52%	3.2	4.4	138%	15.4	7.6	49%
LMIC	17.8	7.8	44%	1.9	3.4	180%	20.3	9.2	45%	4.9	5.3	109%	25.2	9.6	38%
UMIC	19.2	6.1	32%	3.9	4.8	123%	24.4	8.7	36%	5.9	5.3	90%	30.3	9.2	30%
HIC	25.2	7.1	28%	6.3	5.6	89%	33.0	8.8	27%	6.9	3.4	49%	39.9	9.5	24%
Oil revenue dominated (RG1)	5.4	8.4	156%	0.0			5.4	8.4	156%	38.2	19.3	50%	43.6	17.4	40%
Resource Dependent Economies (RG2)	15.6	8.1	52%	0.8	2.1	273%	17.0	9.2	54%	6.4	7.3	115%	23.3	11.4	49%
South Asia	10.0	3.5	35%	0.0	0.1	305%	10.2	3.8	37%	4.0	4.5	112%	14.2	4.8	34%
Sub-Saharan Africa	14.9	9.0	60%	0.1	0.3	363%	14.9	8.9	60%	3.8	5.6	148%	18.7	11.2	60%
East & Southeast Asia	15.1	5.7	37%	0.9	2.3	255%	16.3	6.7	41%	4.2	2.9	68%	20.6	7.1	35%
Latin America	15.0	4.5	30%	1.6	2.3	143%	17.5	5.2	30%	3.5	2.4	70%	21.0	5.9	28%
Former USSR	19.6	5.2	27%	2.6	4.1	156%	26.1	8.0	31%	4.7	4.7	101%	30.7	9.7	32%
Eastern Europe	22.5	5.4	24%	5.3	5.9	111%	33.4	6.9	21%	4.7	2.3	48%	38.1	8.1	21%

Other Europe	26.5	6.8	26%	6.5	5.7	89%	35.3	7.8	22%	7.0	2.6	37%	42.3	8.7	21%
Residual group	20.5	9.4	46%	1.2	2.1	174%	22.4	10.0	45%	8.8	6.8	77%	31.2	9.2	30%
All (ex. RG1)	18.1	8.6	48%	2.1	4.1	191%	21.4	11.4	53%	5.0	5.0	99%	26.5	13.0	49%

Annex 2: List of variables, sources and adjustments

A 2.1. Revenue variables

Cross-country studies of DRM are limited by data availability even for basic estimates of population and GDP. Fortunately, over time the data availability has been improving. For example, in the World Bank WDI database the number of countries with population and GDP estimates has been rising. In Annex 1, Table A 1.1 shows that in 1980 out of 214 countries, only 152 had population estimates and 143 had GDP estimates. Nevertheless, this represented a large share at 93.6% of the world population and 99.3% of world GDP. The number of countries with population estimates rose to 193 in 1990, 204 in 2000 and 218 in 2015. The number of countries with GDP estimates rose to 177 in 1990, 194 in 2000, and 192 in 2015. Since 1990, the share of the world population and GDP covered has been about 99% or higher.

In conducting this cross-country study of DRM, it was determined that two groups of countries would be dropped. One was the limited number of eight oil-revenue-dominated countries, namely, Bahrain, Brunei, Iraq, Kuwait, Libya, Qatar, Saudi Arabia, and United Arab Emirates. As shown in Table A 5.1, these countries average over 19% of GDP in non-tax revenues and with the exception of Brunei, average well below 10% of GDP in tax revenues and typically have no social security contributions. With domestic revenues averaging from 28% to 60% of GDP over the sample period, these countries do not provide any pointers towards ways of enhancing revenues for LICs and MICs. They are also unlikely to show any rapid movements towards enhanced revenues through tax collection. In more recent times (beyond the sample period for the data for this study), Saudi Arabia has started consideration of broadening its tax raising capacity as its population is growing relative to its capacity to fund its public sector service delivery primarily from oil-based non-tax revenues. Table A 2.1 shows that based on WDI data, dropping these eight countries from the study only cut out some 1% or less of the world population and some 2% of GDP of all the available countries.

The other countries that were dropped from this DRM study were the large number of small islands and countries. Small islands were classed as the 40 islands having less than one million in population and less than \$1 billion in GDP in 2010\$ and small countries were the six LICs or MICs with one million in population and less than \$0.5 billion in GDP in 2010\$. These countries form about 21% of the countries of the world, but only contain about 0.5% of the world population and 0.4% of the world GDP as can be seen from Table A 2.1. They also tend to have imbalanced or specialized economies dominated by a few sectors such as tourism, and importantly many of these countries lack some basic economic and fiscal information. Table A 2.1 shows that as recently as 2010 some 20% of these countries lack GDP estimates. When the availability of tax data in the ICTD General Revenue Database is also checked then only nine of these countries had data estimates in 1980 and only 24 out of the 46 in 2010. Hence, it is clear that these countries are problematic even in representing themselves in terms of revenue performance as well as being doubtful comparators of larger more balanced economies.

Table A 2.1: Distribution of available data in WDI by income class for population and GDP after exclusion of small countries and islands and oil dominated countries (RG1) for 1980, 1990, 2000 and 2010

Year	Merged data country income class in year	Population, total (millions)	Distribution	Number of countries ^a	GDP (current US\$) (billions)	Distribution	Number of countries ^b
1980	Excluded countries						
	Small countries and islands	21.8	0.6%	45	32.6	0.3%	24
	Oil dominated countries (RG1)	29.8	0.8%	8	306.0	2.9%	7
	Remaining countries						
	LIC	1,981.1	51.0%	21	441.5	4.1%	20
	LMC	610.3	15.7%	41	410.2	3.8%	37
	UMC	487.5	12.5%	26	1,124.4	10.6%	26
	HIC	756.9	19.5%	31	8,342.2	78.3%	30
	Total for remaining countries	3,835.8	98.7%	119	10,318.3	96.8%	113
	Total for all countries	3,887.4	100.0%	172	10,656.9	100.0%	144
1990	Excluded countries						
	Small countries and islands	26.2	0.5%	45	61.7	0.3%	29
	Oil dominated countries (RG1)	43.4	0.8%	8	410.7	1.8%	8
	Remaining countries						
	LIC	3,075.5	58.9%	51	1,071.9	4.8%	46
	LMC	749.1	14.3%	51	1,243.2	5.5%	50
	UMC	536.9	10.3%	19	1,951.2	8.7%	17
	HIC	792.9	15.2%	29	17,764.4	78.9%	29
	Total for remaining countries	5,154.3	98.7%	150	22,030.7	97.9%	142
	Total for all countries	5,224.0	100.0%	203	22,503.0	100.0%	179
2000	Excluded countries						
	Small countries and islands	30.6	0.5%	46	137.6	0.4%	34
	Oil dominated countries (RG1)	56.5	0.9%	8	402.7	1.2%	7
	Remaining countries						

LIC	2,482.0	40.8%	59	1,085.4	3.3%	56
LMC	2,012.9	33.1%	40	2,438.2	7.4%	40
UMC	623.3	10.3%	24	3,330.6	10.1%	24
HIC	874.1	14.4%	35	25,741.7	77.7%	35
Total for remaining countries	5,992.3	98.6%	158	32,595.9	98.4%	155
Total for all countries	6,079.3	100.0%	212	33,136.2	100.0%	196
2010						
Excluded countries						
Small countries and islands	34.5	0.5%	46	229.1	0.4%	37
Oil dominated countries (RG1)	79.0	1.1%	8	1,311.3	2.0%	8
Remaining countries						
LIC	797.4	11.6%	33	464.9	0.7%	31
LMC	2,490.3	36.1%	43	4,355.4	6.7%	42
UMC	2,438.4	35.4%	40	15,749.2	24.1%	40
HIC	1,057.8	15.3%	46	43,223.4	66.2%	44
Total for remaining countries	6,783.9	98.4%	162	63,792.9	97.6%	157
Total for all countries	6,897.5	100.0%	216	65,333.4	100.0%	202

- a. Number of countries with population estimate in WDI for year
b. Number of countries with GDP estimate in WDI for year

Table A 2.2: Distribution of available data in WDI by income class for population and GDP and tax data in the ICTD General Revenue Database after exclusion of small countries and islands and oil dominated countries (RG1) for 1980, 1990, 2000 and 2010

Year	Merged data country income class in year	Population, total (millions)	Distribution	Share of Table A2.1	Number of countries ^a	Share of Table A2.1	GDP (current US\$) (billions)	Distribution	Share of Table A2.1	Number of countries ^b	Share of Table A2.1
1980											
Excluded countries											
	Small countries and islands	9.5	0.3%	44%	9	20%	12.1	0.1%	37%	8	33%
	Oil dominated countries (RG1)	1.7	0.1%	6%	2	25%	31.7	0.3%	10%	2	29%
Remaining countries											
	LIC	1,826.6	58.0%	92%	11	52%	414.0	4.4%	94%	11	55%
	LMC	360.3	11.4%	59%	21	51%	240.2	2.5%	59%	21	57%
	UMC	202.6	6.4%	42%	14	54%	437.9	4.6%	39%	14	54%
	HIC	750.4	23.8%	99%	24	77%	8,304.3	88.0%	100%	24	80%
	Total for remaining countries	3,139.8	99.6%	82%	70	59%	9,396.4	99.5%	91%	70	62%
	Total for all countries	3,151.1	100.0%	81%	81	47%	9,440.2	100.0%	89%	80	56%
1990											
Excluded countries											
	Small countries and islands	19.9	0.4%	76%	18	40%	20.5	0.1%	33%	16	55%
	Oil dominated countries (RG1)	4.7	0.1%	11%	4	50%	76.9	0.4%	19%	4	50%
Remaining countries											
	LIC	2,847.7	62.0%	93%	36	71%	997.0	4.7%	93%	35	76%
	LMC	565.2	12.3%	75%	37	73%	1,000.2	4.7%	80%	37	74%
	UMC	372.2	8.1%	69%	13	68%	1,377.8	6.5%	71%	12	71%
	HIC	787.0	17.1%	99%	24	83%	17,681.5	83.6%	100%	24	83%
	Total for remaining countries	4,572.2	99.5%	89%	110	73%	21,056.5	99.5%	96%	108	76%
	Total for all countries	4,596.7	100.0%	88%	132	65%	21,153.8	100.0%	94%	128	72%
2000											
Excluded countries											

Small countries and islands	23.7	0.4%	77%	23	50%	52.8	0.2%	38%	22	65%
Oil dominated countries (RG1)	32.9	0.6%	58%	7	88%	402.7	1.2%	100%	7	100%
Remaining countries										
LIC	2,181.5	38.5%	88%	53	90%	899.9	2.7%	83%	53	95%
LMC	1,934.8	34.1%	96%	36	90%	2,330.4	7.0%	96%	36	90%
UMC	619.8	10.9%	99%	22	92%	3,306.0	10.0%	99%	22	92%
HIC	873.9	15.4%	100%	31	89%	25,734.0	77.6%	100%	31	89%
Total for remaining countries	5,610.1	99.0%	94%	142	90%	32,270.4	97.3%	99%	142	92%
Total for all countries	5,666.6	100.0%	93%	172	81%	33,181.4	98.6%	100%	171	87%
2010										
Excluded countries										
Small countries and islands	27.9	0.4%	81%	24	52%	102.3	0.2%	45%	24	65%
Oil dominated countries (RG1)	46.1	0.7%	58%	5	63%	1,034.0	1.6%	79%	5	63%
Remaining countries										
LIC	727.5	11.4%	91%	29	88%	446.9	0.7%	96%	29	94%
LMC	2,168.4	34.0%	87%	36	84%	3,626.5	5.6%	83%	36	86%
UMC	2,362.2	37.0%	97%	38	95%	15,267.0	23.6%	97%	38	95%
HIC	1,053.2	16.5%	100%	39	85%	43,126.5	66.6%	100%	38	86%
Total for remaining countries	6,311.3	98.8%	93%	142	88%	62,466.9	96.5%	98%	141	90%
Total for all countries	6,385.3	100.0%	93%	171	79%	64,739.5	98.2%	99%	170	84%

- a. Number of countries with population estimate in WDI for year
b. Number of countries with GDP estimate in WDI for year

Table A 2.3: Sample size of data from International Center for Tax and Development General Revenue Dataset

	Taxes & SSC			Domestic Revenue ⁶⁴ or Non-tax Revenue			Grants		
	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
All (ex RG1 and small countries and islands)									
Observations	4347	2397	1950	3866	2018	1848	4347	2397	1950
Countries	155	150	152	154	147	147	155	150	152
HIC									
Observations	832	342	490	758	273	485	832	342	490
Countries	44	32	44	43	32	43	44	32	44
UMIC									
Observations	606	221	385	500	161	339	606	221	385
Countries	57	33	50	52	30	45	57	33	50
LMIC									
Observations	974	479	495	888	431	457	974	479	495
Countries	85	70	69	79	64	64	85	70	69
LIC									
Observations	1156	588	568	1126	568	558	1156	588	568
Countries	66	63	58	66	63	57	66	63	58

For cases where the gap between central and general data was under 0.5 percent, the following adjustments were made:

Table A 2.4: List of adjustments made to International Center for Tax and Development's General Revenue Dataset

Country	Adjustment made to data
Armenia	General government data from 1991 to 1994 dropped
Azerbaijan	Central government data used, but data from 1994 to 1996 dropped
Bolivia	General government data used, but data from 1985 to 1992 dropped
El Salvador	General data from 2008 to 2012 used; for previous years non-tax revenue and/or social contributions is missing in many years
Honduras	Central government data used data from 1990 onwards; earlier years omitted
Kyrgyz Republic	Data from 1992 to 1998 dropped
Lao Republic	General government data used, but data before 1992 dropped
Libya	Only general government data used
Malta	General government data used in years when available; otherwise central government data is used
Mexico	General government data is reported as central. Data reclassified as general government; all general government data from ICTD dataset dropped

⁶⁴ Domestic revenue is the sum of tax plus SSC and non-tax revenue.

Mongolia	General government data based on IMF country reports used; central government data from IMF GFS used
Montenegro	Only general government data used
Pakistan	General government data based on IMF country reports used; central government data from IMF GFS used
San Marino	Only central government data used
St. Kitts and Nevis	Only central government data used
St. Lucia	General government data used from 1979-2004; central government data used for remaining years.
Syria	Data for 2008 dropped

For the purpose of our study, we have used the general government data on tax including social security contributions, tax excluding social security contributions and social security contributions as the primary data. Wherever the general government data on these variables was not available, we have used the central government data. A dummy variable was added to the data to indicate whether the revenue data was for general government or not. Domestic revenue is the sum of taxes plus social security and non-tax revenue. The total revenue for the country during the year has been calculated by adding up the domestic revenue and grants. Wherever the value of grants was zero or blank, total revenue equals domestic revenue.

A 2.2. Explanatory variables

The main categories and list of explanatory factors and the data source used in our study to determine the revenue performance of a country are listed in the following table:

Table A 2.5: Explanatory factors used in the study and sources, adjustments made to the data

Variable	Definition	Sources
Economic structure: macroeconomic indicators		
Income class of country	Each country-year is classified into income classifications (LIC, LMIC, UMIC and HIC) according to the World Bank Analytical Classification for the country and year based on the GNI per capita in US\$ using the Atlas Methodology	World Development Indicators
GDP per capita (constant 2010 US\$)	GDP per capita is gross domestic product divided by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources. Data are in constant 2010 U.S. dollars	World Development Indicators
Gross National Disposable Income, Net Primary Income and Net Secondary Income (% of GDP)	Gross national disposable income may be derived from gross national income by adding all current transfers in cash or in kind receivable by resident institutional units from non-resident units and subtracting all current transfers in cash or in kind payable by resident institutional units to non-resident units. GNDI/GDP calculated as: $[1 + (\text{Net primary income} + \text{net secondary income})/\text{GDP}]$	World Development Indicators

Working age population (15-65) as a share of total population (%)		World Development Indicators
Inflation, consumer prices (annual %)	Inflation as measured by the consumer price index reflects the annual percentage change in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as yearly. The Laspeyres formula is generally used.	World Development Indicators
Consumer price index (2010 = 100)	Consumer price index reflects changes in the cost to the average consumer of acquiring a basket of goods and services that may be fixed or changed at specified intervals, such as annual. The Laspeyres formula is generally used. Data are annual averages.	World Development Indicators
Official exchange rate (LCU/USD, period average)	Official exchange rate refers to the exchange rate determined by national authorities or to the rate determined in the legally sanctioned exchange market. It is calculated as an annual average based on monthly averages (LCU relative to the U.S. dollar).	World Development Indicators
Real exchange rate index (LCU/USD, PPP 2010 =100)	The official exchange is first expressed as its purchasing power parity real exchange rate relative to its 2010 value by adjusting the annual exchange rates by the relative 2010 consumer price indices of the USD over the 2010 price index of the LCU 2010 price index. The 2010 PPP exchange rate is then converted to a price index setting the rate in 2010 equal to 100.	Calculated from World Development Indicators data
Real effective exchange rate index (2010 = 100)	Real effective exchange rate is the nominal effective exchange rate (a measure of the value of a currency against a weighted average of several foreign currencies) divided by a price deflator or index of costs.	World Development Indicators and International Monetary Fund, International Financial Statistics.
World non-energy commodity price index (2010=100, real 2010 USD)	The World Bank monitors major commodity markets important to the developing countries. Monthly prices for over 70 series are published at the beginning of each month. Price forecasts for the next 10 years are published on a quarterly basis. A comprehensive review of commodity markets is published four times a year, January, April, July, and October. The Pink Sheet for each month contains the prices from the previous month. The commodity price indices were rebased to 2010 = 100 in December 2013.	World bank Commodity Price data (Pink Sheet)
World energy price index (2010=100, real 2010 USD)	The World Bank monitors major commodity markets important to the developing countries. Monthly prices for over 70 series are published at the beginning of each month. Price forecasts for the next 10 years are published on a quarterly basis. A comprehensive review of commodity markets is published four times a year, January, April, July, and October. The Pink Sheet for each month contains the prices from the previous month. The commodity price indices were rebased to 2010 = 100 in December 2013.	World bank Commodity Price data from Global Economic Monitor Commodities

Economic structure: tax handles

Import of merchandise goods/GDP (%)	Merchandise imports show the c.i.f. value of goods received from the rest of the world valued in current U.S. dollars.	World Development Indicators
Mining value added/GDP (%)	Value added of mining and quarrying sector as share of GDP	UN Data
Natural resource exports/GDP (%)	Natural resource exports have been calculated by adding up the ores and metals exports and fuel exports. Ores and metals comprise the commodities in SITC sections 27 (crude fertilizer, minerals nes); 28 (metalliferous ores, scrap); and 68 (non-ferrous metals). Fuels comprise SITC section 3 (mineral fuels).	World Development Indicators
Inbound tourism expenditures/GDP (%) and Inbound tourism travel revenue/GDP (%)		UN World Tourism Organization
Economic structure: hard to tax informal sector		
Shadow economy (% of GDP)	Schneider et al paper defines shadow economy to include "all market-based legal production of goods and services that are deliberately concealed from public authorities for any of the following reasons: (1) to avoid payment of income, value added or other taxes, (2) to avoid payment of social security contributions, (3) to avoid having to meet certain legal labor market standards, such as minimum wages, maximum working hours, safety standards, etc., and (4) to avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms."	Schneider, F., Buehn, A., & Montenegro, C. E. (2010). New estimates for the shadow economies all over the world. <i>International Economic Journal</i> , 24(4), 443-461
Compensation of employees (% of GDP)	Compensation of employees consists of all payments in cash, as well as in kind (such as food and housing), to employees in return for services rendered, and government contributions to social insurance schemes such as social security and pensions that provide benefits to employees.	UNdata
Paid employed labor force as share of working age (15-64) population (%)	Wage and salaried workers, total (% of total employment) multiplied by Employment to population ratio, 15+, total (%) (modeled International Labor Organization estimate) divided by Population, 15-64 years, total multiplied by Population 15+, total	World Development Indicators
Agriculture value added/GDP (%)	Agriculture corresponds to International Standard Industrial Classification divisions 1-5 and includes forestry, hunting, and fishing, as well as cultivation of crops and livestock production. Value added is the net output of a sector after adding up all outputs and subtracting intermediate inputs. It is calculated without making deductions for depreciation of fabricated assets or depletion and degradation of natural resources. The origin of value added is determined by the International Standard Industrial Classification, revision 3.	World Development Indicators
Rural population share (% of total population)	Rural population refers to people living in rural areas as defined by national statistical offices. It is calculated as the difference between total population and urban population.	World Development Indicators

Level/type of government		
Federal structure of government	Dummy variable used for federal (=1) versus centralized structure (=0) of government	Central Intelligence Agency Factbook, Wikipedia
General government revenue indicator	Dummy variable = 1 if revenue data is for general government, but = 0 if for central government only	Based on ICTD data
Tax policy variables		
Trade weighted applied import tariff rate	Weighted mean applied tariff is the average of effectively applied rates weighted by the product import shares corresponding to each partner country. Data are classified using the Harmonized System of trade at the six- or eight-digit level. Tariff line data were matched to Standard International Trade Classification (SITC) revision 3 codes to define commodity groups and import weights. To the extent possible, specific rates have been converted to their ad valorem equivalent rates and have been included in the calculation of weighted mean tariffs. Import weights were calculated using the United Nations Statistics Division's Commodity Trade (Comtrade) database. Effectively applied tariff rates at the six- and eight-digit product level are averaged for products in each commodity group. When the effectively applied rate is unavailable, the most favored nation rate is used instead.	World Development Indicators
General Sales Tax or Value Added Tax	Standard or regular GST or VAT rate	OECD, CEPAL ⁶⁵ , KPMG
Personal Income Tax rate (combined central & subnational)	Top personal income tax rate. Any subnational personal income tax rate is combined with the central rate.	Wherever, tax rate data is unavailable from OECD and CEPAL, data from KPMG and authors' own research from country government documents has been used
Corporate Income Tax rate (combined central & subnational)	Standard corporate tax rate. Any subnational personal income tax rate is combined with the central rate	
Tax payer compliance capacity variables		
Adult literacy rate, population 15+ years, both sexes (%)	Percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the corresponding age group population and multiplying the result by 100.	World Development Indicators Since data was missing for many countries in this dataset, countries with at least four observations between 1999 till latest, extrapolations have been made for the adult education data

⁶⁵ Economic Commission for Latin America and the Caribbean

	to fill data gaps between years
Adult primary completion rate	UNESCO Institute for Statistics
Share of adult population (25 years and over) with no schooling	UNESCO Institute for Statistics
Share of adult population (25 years and over) with post-secondary education	UNESCO Institute for Statistics

Governance and tax administrative capacity variables

Political risk indicators	International Country Risk Guide Researchers' Dataset on political risks [Table 3B] which covers more than 140 countries over a time period of 30 years. The political risk indicators cover 12 sub-indicators (Government Stability, Socioeconomic Conditions, Investment Profile, Internal Conflict, External Conflict, Corruption, Military in Politics, Religion in Politics, Law and Order, Ethnic Tensions, Democratic Accountability, and Bureaucracy Quality). Most of the sub-indicators capture important administrative, legal and bureaucratic qualities which directly impacts the tax administration quality of a country. We have constructed a normalized composite out of 100 combining the score of the various political risk sub-indicators.	Political Risk Group International Country Risk Guide
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Annex 3: Trends in taxes and domestic revenues across income groups and regional groups of countries

Table A 3.1: Revenue performance and composition by countries by income class and in sample periods before and after 2000

		Central revenue over General Revenue (%)			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
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
	<i>SD</i>	16.9	18.3	15.3	6.1	6.5	5.6	1.1	0.9	1.3	6.4	6.6	6.0
	<i>Min</i>	21.8	21.8	36.0	0.6	0.6	1.0	-	-	-	0.6	0.6	1.0
	<i>Max</i>	100.0	100.0	100.0	45.9	45.3	45.9	9.8	9.8	8.8	45.9	45.3	45.9
	<i>Observations</i>	189	96	93	1107	558	549	1156	588	568	1156	588	568
	<i>Countries</i>	21	16	17	63	60	56	66	63	58	66	63	58
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
	<i>SD</i>	17.1	15.9	18.2	7.8	7.0	8.5	3.6	3.7	3.6	9.2	8.6	9.7
	<i>Min</i>	17.2	17.5	17.2	3.6	3.6	4.6	0.0	0.0	0.0	4.4	4.4	4.6
	<i>Max</i>	100.0	100.0	100.0	62.8	44.8	62.8	19.5	19.5	13.3	62.8	45.7	62.8
	<i>Observations</i>	370	178	192	932	448	484	974	479	495	974	479	495
	<i>Countries</i>	46	31	36	84	68	67	85	70	69	85	70	69
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
	<i>SD</i>	17.3	18.5	16.6	6.0	6.4	5.7	4.8	5.2	4.6	8.7	9.9	7.9
	<i>Min</i>	10.8	10.8	45.9	5.1	5.1	8.5	0.0	0.0	0.0	6.4	6.4	8.7
	<i>Max</i>	100.0	100.0	100.0	46.3	38.9	46.3	18.7	18.7	15.7	51.4	51.4	47.2
	<i>Observations</i>	291	96	195	584	207	377	606	221	385	606	221	385
	<i>Countries</i>	35	18	29	57	31	50	57	33	50	57	33	50
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
	<i>SD</i>	19.9	18.0	20.8	7.1	7.1	7.0	5.2	5.5	5.0	8.8	8.8	8.7
	<i>Min</i>	27.1	27.5	27.1	8.6	8.7	8.6	0.0	0.0	0.0	8.6	8.7	8.6
	<i>Max</i>	100.0	100.0	100.0	48.4	47.6	48.4	19.2	19.2	16.8	50.6	50.6	49.5
	<i>Observations</i>	690	262	428	830	340	490	832	342	490	832	342	490

<i>Countries</i>		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
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
	<i>SD</i>	16.9	18.3	15.3	6.1	6.5	5.6	1.1	0.9	1.3	6.4	6.6	6.0
	<i>Min</i>	21.8	21.8	36.0	0.6	0.6	1.0	-	-	-	0.6	0.6	1.0
	<i>Max</i>	100.0	100.0	100.0	45.9	45.3	45.9	9.8	9.8	8.8	45.9	45.3	45.9
	<i>Observations</i>	189	96	93	1107	558	549	1156	588	568	1156	588	568
	<i>Countries</i>	21	16	17	63	60	56	66	63	58	66	63	58
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
	<i>SD</i>	17.1	15.9	18.2	7.8	7.0	8.5	3.6	3.7	3.6	9.2	8.6	9.7
	<i>Min</i>	17.2	17.5	17.2	3.6	3.6	4.6	0.0	0.0	0.0	4.4	4.4	4.6
	<i>Max</i>	100.0	100.0	100.0	62.8	44.8	62.8	19.5	19.5	13.3	62.8	45.7	62.8
	<i>Observations</i>	370	178	192	932	448	484	974	479	495	974	479	495
	<i>Countries</i>	46	31	36	84	68	67	85	70	69	85	70	69
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
	<i>SD</i>	17.3	18.5	16.6	6.0	6.4	5.7	4.8	5.2	4.6	8.7	9.9	7.9
	<i>Min</i>	10.8	10.8	45.9	5.1	5.1	8.5	0.0	0.0	0.0	6.4	6.4	8.7
	<i>Max</i>	100.0	100.0	100.0	46.3	38.9	46.3	18.7	18.7	15.7	51.4	51.4	47.2
	<i>Observations</i>	291	96	195	584	207	377	606	221	385	606	221	385
	<i>Countries</i>	35	18	29	57	31	50	57	33	50	57	33	50
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
	<i>SD</i>	19.9	18.0	20.8	7.1	7.1	7.0	5.2	5.5	5.0	8.8	8.8	8.7
	<i>Min</i>	27.1	27.5	27.1	8.6	8.7	8.6	0.0	0.0	0.0	8.6	8.7	8.6
	<i>Max</i>	100.0	100.0	100.0	48.4	47.6	48.4	19.2	19.2	16.8	50.6	50.6	49.5
	<i>Observations</i>	690	262	428	830	340	490	832	342	490	832	342	490
	<i>Countries</i>	40	28	39	44	31	44	44	32	44	44	32	44

Table A 3.2: Revenue performance and composition by countries by regional group and in sample periods before and after 2000

		Central revenue over General Revenue (%)			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
South Asia	Mean	88.8	90.2	87.7	9.9	9.2	10.8	0.0	0.0	0.0	10.2	9.8	10.8
	SD	15.7	15.8	15.7	3.5	3.7	3.0	0.1	0.1	0.1	3.8	4.2	3.0
	Min	60.2	61.2	60.2	3.6	3.6	5.6	-	-	-	3.6	3.6	5.6
	Max	100.0	100.0	100.0	18.4	18.4	17.9	0.3	0.3	0.3	18.8	18.8	17.9
	Observations	60	26	34	191	113	78	202	123	79	202	123	79
	Countries	3	3	3	6	6	6	7	6	7	7	6	7
Sub Saharan Africa	Mean	88.5	91.6	86.9	14.9	14.4	15.4	0.1	0.1	0.1	14.9	14.5	15.5
	SD	15.2	7.8	17.7	9.0	8.6	9.5	0.3	0.3	0.3	8.9	8.5	9.4
	Min	36.0	80.3	36.0	0.6	0.6	1.0	-	-	-	0.6	0.6	1.0
	Max	100.0	100.0	100.0	62.8	45.3	62.8	1.9	1.4	1.9	62.8	45.3	62.8
	Observations	68	23	45	1,222	704	518	1,263	729	534	1,263	729	534
	Countries	7	3	6	41	41	40	42	42	41	42	42	41
East and Southeast Asia	Mean	80.5	76.7	83.6	15.1	14.8	15.5	1.2	1.0	1.5	16.3	15.8	17.0
	SD	21.9	20.7	22.5	5.7	5.3	6.1	2.6	2.3	2.9	6.7	6.3	7.2
	Min	21.8	21.8	34.6	1.7	2.2	1.7	-	-	-	1.7	2.2	1.7
	Max	10.0	100.0	100.0	37.6	31.6	37.6	12.2	9.3	12.2	37.7	33.6	37.7
	Observations	196	89	107	483	271	212	483	271	212	483	271	212
	Countries	12	9	10	16	16	16	16	16	16	16	16	16
Latin America	Mean	87.3	88.3	85.7	14.9	14.1	15.9	2.4	2.4	2.3	17.3	16.5	18.3
	SD	13.2	12.8	13.8	4.5	4.2	4.6	2.4	2.4	2.5	5.2	5.0	5.3
	Min	45.6	45.6	51.5	4.4	4.4	8.1	-	-	-	4.4	4.4	9.0
	Max	100.0	100.0	100.0	31.7	30.2	31.7	8.6	7.6	8.6	33.9	33.9	33.2
	Observations	266	165	101	536	285	251	560	298	262	560	298	262
	Countries	13	13	11	20	20	20	20	20	20	20	20	20

Former USSR	Mean	75.4	73.1	76.1	19.6	19.9	19.5	6.1	5.6	6.3	26.1	26.0	26.1
	SD	14.8	13.8	15.1	5.2	6.9	4.4	4.2	4.6	4.1	8.0	9.8	7.1
	Min	39.7	39.7	41.2	7.0	7.2	7.0	-	-	-	9.0	9.0	9.5
	Max	100.0	100.0	100.0	36.4	36.4	28.8	14.8	14.8	13.2	47.5	47.5	40.1
	Observations	188	45	143	253	73	180	272	85	187	272	85	187
	Countries	14	9	14	15	15	14	15	15	14	15	15	14
Eastern Europe	Mean	76.4	81.1	73.5	22.5	24.8	21.1	10.9	10.9	10.9	33.4	35.9	32.0
	SD	19.6	16.3	21.0	5.4	7.3	3.2	3.4	4.0	3.0	6.9	8.8	4.9
	Min	17.2	17.5	17.2	8.7	8.7	15.7	-	-	-	12.4	12.4	19.9
	Max	100.0	100.0	100.0	42.4	42.4	30.0	19.5	19.5	15.7	52.2	52.2	39.7
	Observations	216	83	133	286	106	180	288	108	180	288	108	180
	Countries	13	11	13	14	11	14	14	11	14	14	11	14
Other Europe	Mean	62.8	62.3	63.2	26.5	26.3	26.7	8.9	8.7	9.2	35.3	34.9	35.9
	SD	18.6	18.2	18.9	6.8	7.0	6.4	4.8	5.1	4.4	7.8	8.1	7.3
	Min	27.1	27.5	27.1	11.4	11.4	13.0	-	-	-	13.0	15.0	13.0
	Max	100.0	100.0	100.0	48.4	47.6	48.4	19.2	19.2	16.8	50.9	50.9	49.5
	Observations	476	208	268	715	423	292	730	438	292	730	438	292
	Countries	20	19	20	21	21	21	21	21	21	21	21	21
Residual countries	Mean	71.7	70.1	74.0	20.7	20.9	20.4	1.9	1.6	2.3	22.4	22.3	22.6
	SD	22.8	23.9	21.0	9.3	9.6	8.8	2.4	2.1	2.7	10.0	10.1	9.8
	Min	10.8	10.8	36.3	3.6	3.6	4.6	-	-	-	4.6	4.6	4.6
	Max	100.0	100.0	100.0	46.5	46.5	41.4	8.2	6.7	8.2	51.5	51.5	45.5
	Observations	219	131	88	521	320	201	549	345	204	549	345	204
	Countries	11	8	10	19	18	17	20	19	19	20	19	19
All (ex RG1 and small countries)	Mean	75.0	75.3	74.6	18.2	17.9	18.5	3.3	3.0	3.7	21.5	20.9	22.2
	SD	20.6	20.6	20.6	8.6	9.0	8.2	4.7	4.6	4.8	11.4	11.6	11.0
	Min	10.8	10.8	17.2	0.6	0.6	1.0	-	-	-	0.6	0.6	1.0

and islands)	Max	100.0	100.0	100.0	62.8	47.6	62.8	19.5	19.5	16.8	62.8	52.2	62.8																																																																																																																																																																																																																																																																																																																	
	Observations	1,689	770	919	4,207	2,295	1,912	4,347	2,397	1,950	4,347	2,397	1,950																																																																																																																																																																																																																																																																																																																	
	Countries	93	75	87	152	148	148	155	150	152	155	150	152																																																																																																																																																																																																																																																																																																																	
<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="3">Non-tax revenue over GDP (%)</th> <th colspan="3">Domestic revenue over GDP (%)</th> <th colspan="3">Grants over GDP (%)</th> <th colspan="3">Total revenue over GDP (%)</th> </tr> <tr> <th colspan="2"></th> <th>All</th> <th>Before 2000</th> <th>2000 and after</th> <th>All</th> <th>Before 2000</th> <th>2000 and after</th> <th>All</th> <th>Before 2000</th> <th>2000 and after</th> <th>All</th> <th>Before 2000</th> <th>2000 and after</th> </tr> </thead> <tbody> <tr> <td rowspan="6">South Asia</td> <td>Mean</td> <td>3.5</td> <td>3.5</td> <td>3.5</td> <td>13.5</td> <td>12.9</td> <td>14.3</td> <td>3.2</td> <td>3.6</td> <td>2.7</td> <td>16.9</td> <td>16.9</td> <td>17.0</td> </tr> <tr> <td>SD</td> <td>3.5</td> <td>3.6</td> <td>3.3</td> <td>4.8</td> <td>5.1</td> <td>4.2</td> <td>6.7</td> <td>7.6</td> <td>4.9</td> <td>9.6</td> <td>10.7</td> <td>7.8</td> </tr> <tr> <td>Min</td> <td>0.7</td> <td>0.7</td> <td>1.3</td> <td>4.3</td> <td>4.3</td> <td>7.0</td> <td>-</td> <td>-</td> <td>-</td> <td>4.3</td> <td>4.3</td> <td>7.0</td> </tr> <tr> <td>Max</td> <td>16.3</td> <td>16.3</td> <td>14.7</td> <td>24.2</td> <td>22.8</td> <td>24.2</td> <td>34.0</td> <td>34.0</td> <td>17.7</td> <td>48.3</td> <td>48.3</td> <td>40.9</td> </tr> <tr> <td>Observations</td> <td>189</td> <td>110</td> <td>79</td> <td>189</td> <td>110</td> <td>79</td> <td>202</td> <td>123</td> <td>79</td> <td>189</td> <td>110</td> <td>79</td> </tr> <tr> <td>Countries</td> <td>7</td> <td>6</td> <td>7</td> <td>7</td> <td>6</td> <td>7</td> <td>7</td> <td>6</td> <td>7</td> <td>7</td> <td>6</td> <td>7</td> </tr> <tr> <td rowspan="6">Sub Saharan Africa</td> <td>Mean</td> <td>3.8</td> <td>3.5</td> <td>4.1</td> <td>18.4</td> <td>17.8</td> <td>19.3</td> <td>2.4</td> <td>2.0</td> <td>3.1</td> <td>20.9</td> <td>19.8</td> <td>22.4</td> </tr> <tr> <td>SD</td> <td>5.6</td> <td>4.6</td> <td>6.7</td> <td>11.2</td> <td>11.3</td> <td>11.1</td> <td>3.4</td> <td>2.9</td> <td>3.8</td> <td>11.5</td> <td>11.9</td> <td>10.7</td> </tr> <tr> <td>Min</td> <td>-</td> <td>-</td> <td>0.1</td> <td>0.7</td> <td>0.7</td> <td>1.1</td> <td>-</td> <td>-</td> <td>-</td> <td>0.7</td> <td>0.7</td> <td>1.1</td> </tr> <tr> <td>Max</td> <td>40.8</td> <td>39.0</td> <td>40.8</td> <td>79.0</td> <td>79.0</td> <td>68.2</td> <td>30.9</td> <td>21.6</td> <td>30.9</td> <td>80.6</td> <td>80.6</td> <td>72.6</td> </tr> <tr> <td>Observations</td> <td>1,208</td> <td>683</td> <td>525</td> <td>1,208</td> <td>683</td> <td>525</td> <td>1,263</td> <td>729</td> <td>534</td> <td>1,208</td> <td>683</td> <td>525</td> </tr> <tr> <td>Countries</td> <td>42</td> <td>42</td> <td>41</td> <td>42</td> <td>42</td> <td>41</td> <td>42</td> <td>42</td> <td>41</td> <td>42</td> <td>42</td> <td>41</td> </tr> <tr> <td rowspan="6">East and Southeast Asia</td> <td>Mean</td> <td>4.2</td> <td>4.2</td> <td>4.3</td> <td>20.1</td> <td>19.3</td> <td>21.1</td> <td>0.7</td> <td>0.7</td> <td>0.7</td> <td>20.7</td> <td>19.9</td> <td>21.8</td> </tr> <tr> <td>SD</td> <td>2.9</td> <td>3.2</td> <td>2.4</td> <td>7.1</td> <td>6.6</td> <td>7.6</td> <td>1.8</td> <td>2.0</td> <td>1.6</td> <td>7.3</td> <td>6.9</td> <td>7.6</td> </tr> <tr> <td>Min</td> <td>0.0</td> <td>0.0</td> <td>1.1</td> <td>3.6</td> <td>3.6</td> <td>4.0</td> <td>-</td> <td>-</td> <td>-</td> <td>3.6</td> <td>3.6</td> <td>4.0</td> </tr> <tr> <td>Max</td> <td>17.3</td> <td>17.3</td> <td>16.2</td> <td>40.1</td> <td>36.2</td> <td>40.1</td> <td>10.9</td> <td>10.9</td> <td>8.5</td> <td>40.1</td> <td>36.2</td> <td>40.1</td> </tr> <tr> <td>Observations</td> <td>461</td> <td>253</td> <td>208</td> <td>461</td> <td>253</td> <td>208</td> <td>483</td> <td>271</td> <td>212</td> <td>461</td> <td>253</td> <td>208</td> </tr> <tr> <td>Countries</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> <td>16</td> </tr> <tr> <td rowspan="3">Latin America</td> <td>Mean</td> <td>3.4</td> <td>3.3</td> <td>3.4</td> <td>20.6</td> <td>19.6</td> <td>21.9</td> <td>0.5</td> <td>0.5</td> <td>0.5</td> <td>21.3</td> <td>20.2</td> <td>22.5</td> </tr> <tr> <td>SD</td> <td>2.4</td> <td>2.4</td> <td>2.4</td> <td>6.0</td> <td>5.7</td> <td>6.0</td> <td>1.2</td> <td>1.3</td> <td>1.0</td> <td>5.9</td> <td>5.6</td> <td>6.0</td> </tr> <tr> <td>Min</td> <td>0.1</td> <td>0.1</td> <td>0.1</td> <td>6.5</td> <td>6.5</td> <td>10.9</td> <td>-</td> <td>-</td> <td>-</td> <td>7.1</td> <td>7.1</td> <td>11.0</td> </tr> </tbody> </table>																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	South Asia	Mean	3.5	3.5	3.5	13.5	12.9	14.3	3.2	3.6	2.7	16.9	16.9	17.0	SD	3.5	3.6	3.3	4.8	5.1	4.2	6.7	7.6	4.9	9.6	10.7	7.8	Min	0.7	0.7	1.3	4.3	4.3	7.0	-	-	-	4.3	4.3	7.0	Max	16.3	16.3	14.7	24.2	22.8	24.2	34.0	34.0	17.7	48.3	48.3	40.9	Observations	189	110	79	189	110	79	202	123	79	189	110	79	Countries	7	6	7	7	6	7	7	6	7	7	6	7	Sub Saharan Africa	Mean	3.8	3.5	4.1	18.4	17.8	19.3	2.4	2.0	3.1	20.9	19.8	22.4	SD	5.6	4.6	6.7	11.2	11.3	11.1	3.4	2.9	3.8	11.5	11.9	10.7	Min	-	-	0.1	0.7	0.7	1.1	-	-	-	0.7	0.7	1.1	Max	40.8	39.0	40.8	79.0	79.0	68.2	30.9	21.6	30.9	80.6	80.6	72.6	Observations	1,208	683	525	1,208	683	525	1,263	729	534	1,208	683	525	Countries	42	42	41	42	42	41	42	42	41	42	42	41	East and Southeast Asia	Mean	4.2	4.2	4.3	20.1	19.3	21.1	0.7	0.7	0.7	20.7	19.9	21.8	SD	2.9	3.2	2.4	7.1	6.6	7.6	1.8	2.0	1.6	7.3	6.9	7.6	Min	0.0	0.0	1.1	3.6	3.6	4.0	-	-	-	3.6	3.6	4.0	Max	17.3	17.3	16.2	40.1	36.2	40.1	10.9	10.9	8.5	40.1	36.2	40.1	Observations	461	253	208	461	253	208	483	271	212	461	253	208	Countries	16	16	16	16	16	16	16	16	16	16	16	16	Latin America	Mean	3.4	3.3	3.4	20.6	19.6	21.9	0.5	0.5	0.5	21.3	20.2	22.5	SD	2.4	2.4	2.4	6.0	5.7	6.0	1.2	1.3	1.0	5.9	5.6	6.0	Min	0.1	0.1	0.1	6.5	6.5	10.9	-	-	-	7.1	7.1	11.0
		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																																																																																																																																																																																																																																																																																																																	
South Asia	Mean	3.5	3.5	3.5	13.5	12.9	14.3	3.2	3.6	2.7	16.9	16.9	17.0																																																																																																																																																																																																																																																																																																																	
	SD	3.5	3.6	3.3	4.8	5.1	4.2	6.7	7.6	4.9	9.6	10.7	7.8																																																																																																																																																																																																																																																																																																																	
	Min	0.7	0.7	1.3	4.3	4.3	7.0	-	-	-	4.3	4.3	7.0																																																																																																																																																																																																																																																																																																																	
	Max	16.3	16.3	14.7	24.2	22.8	24.2	34.0	34.0	17.7	48.3	48.3	40.9																																																																																																																																																																																																																																																																																																																	
	Observations	189	110	79	189	110	79	202	123	79	189	110	79																																																																																																																																																																																																																																																																																																																	
	Countries	7	6	7	7	6	7	7	6	7	7	6	7																																																																																																																																																																																																																																																																																																																	
Sub Saharan Africa	Mean	3.8	3.5	4.1	18.4	17.8	19.3	2.4	2.0	3.1	20.9	19.8	22.4																																																																																																																																																																																																																																																																																																																	
	SD	5.6	4.6	6.7	11.2	11.3	11.1	3.4	2.9	3.8	11.5	11.9	10.7																																																																																																																																																																																																																																																																																																																	
	Min	-	-	0.1	0.7	0.7	1.1	-	-	-	0.7	0.7	1.1																																																																																																																																																																																																																																																																																																																	
	Max	40.8	39.0	40.8	79.0	79.0	68.2	30.9	21.6	30.9	80.6	80.6	72.6																																																																																																																																																																																																																																																																																																																	
	Observations	1,208	683	525	1,208	683	525	1,263	729	534	1,208	683	525																																																																																																																																																																																																																																																																																																																	
	Countries	42	42	41	42	42	41	42	42	41	42	42	41																																																																																																																																																																																																																																																																																																																	
East and Southeast Asia	Mean	4.2	4.2	4.3	20.1	19.3	21.1	0.7	0.7	0.7	20.7	19.9	21.8																																																																																																																																																																																																																																																																																																																	
	SD	2.9	3.2	2.4	7.1	6.6	7.6	1.8	2.0	1.6	7.3	6.9	7.6																																																																																																																																																																																																																																																																																																																	
	Min	0.0	0.0	1.1	3.6	3.6	4.0	-	-	-	3.6	3.6	4.0																																																																																																																																																																																																																																																																																																																	
	Max	17.3	17.3	16.2	40.1	36.2	40.1	10.9	10.9	8.5	40.1	36.2	40.1																																																																																																																																																																																																																																																																																																																	
	Observations	461	253	208	461	253	208	483	271	212	461	253	208																																																																																																																																																																																																																																																																																																																	
	Countries	16	16	16	16	16	16	16	16	16	16	16	16																																																																																																																																																																																																																																																																																																																	
Latin America	Mean	3.4	3.3	3.4	20.6	19.6	21.9	0.5	0.5	0.5	21.3	20.2	22.5																																																																																																																																																																																																																																																																																																																	
	SD	2.4	2.4	2.4	6.0	5.7	6.0	1.2	1.3	1.0	5.9	5.6	6.0																																																																																																																																																																																																																																																																																																																	
	Min	0.1	0.1	0.1	6.5	6.5	10.9	-	-	-	7.1	7.1	11.0																																																																																																																																																																																																																																																																																																																	

	Max	12.7	12.7	12.5	37.4	36.9	37.4	10.7	10.7	6.0	37.6	37.6	37.4
	Observations	474	261	213	474	261	213	560	298	262	474	261	213
	Countries	20	20	17	20	20	17	20	20	20	20	20	17
Former USSR	Mean	4.7	3.3	5.2	30.5	28.8	31.3	0.7	0.2	1.0	31.3	29.1	32.3
	SD	4.7	2.3	5.4	9.7	11.3	8.9	1.1	0.5	1.3	9.6	11.1	8.7
	Min	0.1	0.4	0.1	10.3	10.7	10.3	-	-	-	10.6	10.7	10.6
	Max	32.2	10.0	32.2	56.2	56.2	51.1	5.5	3.6	5.5	56.2	56.2	51.1
	Observations	254	77	177	254	77	177	272	85	187	254	77	177
	Countries	15	14	14	15	14	14	15	15	14	15	14	14
Eastern Europe	Mean	4.7	5.0	4.5	37.7	40.2	36.4	0.4	0.2	0.5	38.1	40.5	36.9
	SD	2.3	2.9	1.8	8.1	10.9	5.8	1.1	1.1	1.0	8.0	10.8	5.7
	Min	0.4	0.4	1.6	13.7	13.7	23.1	-	-	-	13.7	13.7	23.7
	Max	13.1	13.1	8.8	61.0	61.0	48.0	10.0	10.0	8.1	61.0	61.0	48.1
	Observations	269	93	176	269	93	176	288	108	180	269	93	176
	Countries	14	11	14	14	11	14	14	11	14	14	11	14
Other Europe	Mean	7.0	7.0	7.0	42.9	42.9	42.9	0.0	0.0	-	42.9	42.9	42.9
	SD	2.6	2.5	2.7	8.7	8.9	8.6	0.2	0.3	-	8.6	8.8	8.6
	Min	2.6	2.6	3.3	18.3	18.9	18.3	-	-	-	18.3	18.9	18.3
	Max	17.6	15.6	17.6	58.9	58.3	58.9	3.6	3.6	-	58.9	58.3	58.9
	Observations	529	241	288	529	241	288	730	438	292	529	241	288
	Countries	21	21	21	21	21	21	21	21	21	21	21	21
Residual countries	Mean	8.8	8.7	9.1	30.5	30.6	30.5	1.1	1.1	1.1	31.8	31.9	31.7
	SD	6.9	6.0	8.1	9.2	9.4	8.9	2.5	2.7	2.2	9.1	9.4	8.5
	Min	-	1.5	-	4.6	10.3	4.6	-	-	-	4.6	10.3	4.6
	Max	39.3	39.3	38.3	60.0	60.0	47.0	16.4	16.4	13.1	60.0	60.0	47.0
	Observations	482	300	182	482	300	182	549	345	204	482	300	182
	Countries	19	17	17	19	17	17	20	19	19	19	17	17

All (ex RG1 and small countries and islands)	Mean	5.0	4.8	5.1	25.7	24.3	27.1	1.2	1.1	1.3	27.0	25.6	28.5
	SD	4.9	4.5	5.3	13.0	13.2	12.6	2.8	2.8	2.7	12.6	13.1	11.9
	Min	-	-	-	0.7	0.7	1.1	-	-	-	0.7	0.7	1.1
	Max	40.8	39.3	40.8	79.0	79.0	68.2	34.0	34.0	30.9	80.6	80.6	72.6
	Observations	3,866	2,018	1,848	3,866	2,018	1,848	4,347	2,397	1,950	3,866	2,018	1,848
	Countries	154	147	147	154	147	147	155	150	152	154	147	147

Annex 4: Country group values for key explanatory variables of revenue performance

Table A 4.1: Economic structure (selected macro variables) by countries in income classes and in sample periods before and after 2000

		GDP per capita (constant 2010 US\$)			GNDI/GDP (%)			Net primary income/GDP (%)			Net secondary income/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
LIC	Mean	742	738	745	106.6	105.8	107.4	(1.3)	(0.7)	(1.9)	9.2	8.6	9.9
	SD	447	463	430	17.4	17.0	17.8	10.6	13.1	7.0	14.4	11.0	17.2
	Observations	1,155	587	568	1,079	541	538	1,055	539	516	1,099	544	555
	Countries	66	63	58	63	59	56	65	62	54	65	61	57
LMIC	Mean	3,166	3,315	3,028	104.0	102.2	105.8	(2.3)	(2.8)	(1.9)	6.5	5.0	7.9
	SD	1,682	1,825	1,526	11.8	9.5	13.3	5.5	4.4	6.3	8.0	7.5	8.2
	Observations	937	451	486	905	434	471	940	460	480	902	429	473
	Countries	83	68	68	79	64	65	81	68	65	80	66	65
UMIC	Mean	8,856	9,571	8,464	98.7	98.3	98.9	(3.0)	(2.4)	(3.3)	2.4	2.5	2.4
	SD	3,511	4,112	3,069	6.6	5.3	7.2	3.2	3.2	3.2	11.3	18.1	4.2
	Observations	596	211	385	585	209	376	589	216	373	579	209	370
	Countries	57	32	50	56	31	49	55	33	48	55	32	48
HIC	Mean	38,047	35,265	40,034	97.9	99.2	97.0	(1.7)	(1.1)	(2.0)	(0.3)	(0.0)	(0.5)
	SD	17,108	13,394	19,096	5.0	2.6	6.0	3.9	2.0	4.7	1.7	2.1	1.4
	Observations	816	340	476	827	342	485	797	314	483	767	300	467
	Countries	43	31	43	44	32	44	43	31	43	42	30	42

		Working age population (15-64) over population (%)			Real LCU /US\$ PPP exchange rate index, 2010=100			Inflation, consumer prices (annual %)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	54.0	53.3	54.7	160.4	177.3	144.8	80.4	104.2	57.6
	SD	<i>4.6</i>	<i>4.2</i>	<i>4.9</i>	<i>501.2</i>	<i>514.9</i>	<i>488.2</i>	<i>1,065.1</i>	<i>1,088.4</i>	<i>1,042.9</i>
	Observations	1,156	588	568	1,007	485	522	1,073	524	549
	Countries	66	63	58	59	54	53	63	58	56
LMIC	Mean	60.6	58.8	62.4	122.7	127.4	118.7	75.2	150.6	8.1
	SD	<i>6.0</i>	<i>5.7</i>	<i>5.8</i>	<i>57.1</i>	<i>78.3</i>	<i>27.3</i>	<i>574.7</i>	<i>831.5</i>	<i>11.6</i>
	Observations	973	479	494	811	376	435	875	412	463
	Countries	85	70	69	70	54	61	77	60	64
UMIC	Mean	65.0	62.9	66.3	114.0	117.3	112.5	27.6	65.1	6.6
	SD	<i>4.5</i>	<i>4.8</i>	<i>3.8</i>	<i>31.0</i>	<i>45.4</i>	<i>21.9</i>	<i>183.8</i>	<i>303.9</i>	<i>6.7</i>
	Observations	606	221	385	458	139	319	567	203	364
	Countries	57	33	50	45	20	43	54	30	48
HIC	Mean	67.3	66.8	67.6	103.9	101.1	105.8	2.9	3.6	2.4
	SD	<i>2.9</i>	<i>2.4</i>	<i>3.1</i>	<i>16.9</i>	<i>17.3</i>	<i>16.5</i>	<i>2.8</i>	<i>3.6</i>	<i>1.9</i>
	Observations	816	340	476	452	182	270	809	333	476
	Countries	43	31	43	28	16	28	43	31	43

Table A 4.2: Economic structure (selected macro variables) by countries in regional groups and in sample periods before and after 2000

		GDP per capita (constant 2010 US\$)			Gross National Disposable Income over GDP (GNDI/GDP) (%)			Net primary income/GDP (%)			Net secondary income/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
South Asia	Mean	857	660	1,162	104.3	101.9	108.2	(0.7)	(0.5)	(1.0)	6.9	5.2	9.2
	SD	551	341	666	7.4	6.5	7.2	1.6	1.8	1.1	5.2	2.9	6.5
	Observations	202	123	79	202	123	79	191	118	73	186	107	79
	Countries	7	6	7	7	6	7	7	6	7	7	6	7
Sub Saharan Africa	Mean	1,611	1,447	1,829	105.3	105.1	105.4	(1.6)	(1.4)	(1.8)	8.1	7.4	9.0
	SD	2,693	2,037	3,366	19.6	19.0	20.5	11.1	12.7	8.4	14.1	10.4	17.8
	Observations	1,246	712	534	1,203	686	517	1,144	667	477	1,177	664	513
	Countries	42	42	41	41	41	40	41	41	37	41	41	40
East and Southeast Asia	Mean	9,699	7,612	12,319	99.4	99.6	99.2	0.5	3.5	(2.8)	1.6	1.2	1.9
	SD	13,654	10,816	16,192	4.4	3.3	5.4	14.4	19.1	3.6	3.3	2.7	3.9
	Observations	478	266	212	468	256	212	445	233	212	444	234	210
	Countries	16	16	16	16	16	16	16	16	16	16	14	16
Latin America	Mean	5,313	4,691	6,020	99.5	98.2	100.9	(4.3)	(4.4)	(4.1)	4.6	4.2	5.1
	SD	3,176	2,679	3,535	5.9	4.6	6.8	3.8	4.4	3.0	11.9	15.5	5.8
	Observations	560	298	262	546	289	257	556	294	262	554	292	262
	Countries	20	20	20	20	19	20	20	20	20	20	20	20
Former USSR	Mean	4,689	2,853	5,386	104.6	102.7	105.2	(1.2)	(1.1)	(1.2)	5.4	2.4	6.4

	SD	<i>4,280</i>	<i>2,376</i>	<i>4,628</i>	<i>11.6</i>	<i>4.9</i>	<i>13.0</i>	<i>5.5</i>	<i>2.9</i>	<i>6.3</i>	<i>8.1</i>	<i>2.9</i>	<i>9.0</i>
	Observations	258	71	187	228	53	175	263	76	187	255	68	187
	Countries	15	15	14	13	12	13	15	15	14	15	15	14
Eastern Europe	Mean	8,721	6,748	9,674	104.3	103.7	104.5	(1.6)	(1.9)	(1.4)	5.5	4.9	5.8
	SD	<i>5,630</i>	<i>4,150</i>	<i>6,002</i>	<i>10.4</i>	<i>12.4</i>	<i>9.3</i>	<i>3.4</i>	<i>4.0</i>	<i>2.9</i>	<i>8.6</i>	<i>11.2</i>	<i>7.1</i>
	Observations	267	87	180	240	76	164	260	96	164	240	76	164
	Countries	14	11	14	12	10	12	12	10	12	12	10	12
Other Europe	Mean	38,023	32,618	46,286	98.8	99.8	97.3	(1.2)	(0.7)	(1.9)	(0.1)	0.3	(0.8)
	SD	<i>18,174</i>	<i>14,401</i>	<i>20,157</i>	<i>4.5</i>	<i>3.5</i>	<i>5.4</i>	<i>4.0</i>	<i>2.4</i>	<i>5.4</i>	<i>2.0</i>	<i>2.3</i>	<i>1.0</i>
	Observations	703	425	278	720	433	287	718	426	292	667	389	278
	Countries	20	20	20	21	21	21	21	21	21	21	20	20
Residual countries	Mean	15,423	14,191	17,388	102.9	102.8	102.9	(2.4)	(2.3)	(2.5)	6.1	6.4	5.5
	SD	<i>15,570</i>	<i>13,394</i>	<i>18,386</i>	<i>9.7</i>	<i>9.5</i>	<i>10.0</i>	<i>2.8</i>	<i>2.7</i>	<i>3.1</i>	<i>9.2</i>	<i>9.4</i>	<i>8.8</i>
	Observations	506	311	195	519	328	191	500	303	197	480	296	184
	Countries	19	18	18	19	18	18	19	18	18	18	18	17
All (ex RG1 and small countries and islands)	Mean	11,342	10,292	12,592	102.3	102.0	102.6	(1.7)	(1.3)	(2.2)	4.9	4.5	5.3
	SD	<i>16,546</i>	<i>14,494</i>	<i>18,624</i>	<i>12.6</i>	<i>12.0</i>	<i>13.3</i>	<i>8.2</i>	<i>9.8</i>	<i>5.6</i>	<i>10.4</i>	<i>9.7</i>	<i>11.2</i>
	Observations	4,220	2,293	1,927	4,126	2,244	1,882	4,077	2,213	1,864	4,003	2,126	1,877
	Countries	153	148	150	149	143	147	151	147	145	149	144	146

		Working age population (15-64) over population (%)			Real LCU /US\$ PPP exchange rate index, 2010=100			Inflation, consumer prices (annual %)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	58.2	56.4	61.0	105.4	97.5	117.5	8.2	9.0	7.0
	SD	4.3	3.4	4.0	26.7	28.5	17.8	4.7	4.5	4.8
	Observations	202	123	79	200	121	79	199	120	79
	Countries	7	6	7	7	6	7	7	6	7
Sub Saharan Africa	Mean	52.7	51.9	53.7	105.9	96.5	116.2	77.1	91.6	60.2
	SD	3.7	3.2	4.1	40.8	47.1	29.4	1,039.7	1,011.1	1,072.6
	Observations	1,263	729	534	1,070	562	508	1,121	602	519
	Countries	42	42	41	40	36	39	41	38	40
East and Southeast Asia	Mean	63.8	61.7	66.6	365.4	531.2	176.7	7.7	10.0	5.1
	SD	6.6	6.2	6.0	1,410.1	1,773.1	783.7	16.6	21.5	6.9
	Observations	483	271	212	432	230	202	452	240	212
	Countries	16	16	16	16	15	16	16	16	16
Latin America	Mean	60.0	58.0	62.2	117.9	120.3	115.6	109.0	199.4	7.5
	SD	4.4	4.0	3.6	38.3	48.8	24.2	709.0	966.8	8.8
	Observations	560	298	262	429	210	219	556	294	262
	Countries	20	20	20	18	16	18	20	20	20
Former USSR	Mean	66.1	63.5	67.3	145.8	201.1	125.2	61.3	214.9	9.8
	SD	4.3	4.5	3.6	95.1	163.1	32.8	357.0	693.9	15.3
	Observations	272	85	187	184	50	134	235	59	176
	Countries	15	15	14	10	10	10	13	12	13
Eastern Europe	Mean	67.9	66.5	68.8	140.1	177.6	117.3	28.0	64.1	6.2
	SD	2.3	2.1	1.9	52.8	58.1	32.7	120.1	190.4	10.3

	Observations	287	108	179	225	85	140	255	96	159
	Countries	14	11	14	11	8	11	12	10	12
Other Europe	Mean	66.3	66.0	66.8	101.7	100.8	102.9	5.0	6.9	2.3
	SD	<i>1.9</i>	<i>2.1</i>	<i>1.4</i>	<i>20.2</i>	<i>22.9</i>	<i>15.4</i>	<i>7.2</i>	<i>8.8</i>	<i>1.6</i>
	Observations	708	430	278	232	137	95	682	404	278
	Countries	20	20	20	7	6	7	20	20	20
Residual countries	Mean	60.7	58.9	63.8	113.7	112.2	116.2	13.5	18.2	5.4
	SD	<i>6.3</i>	<i>6.3</i>	<i>5.1</i>	<i>40.8</i>	<i>47.6</i>	<i>24.6</i>	<i>28.5</i>	<i>34.4</i>	<i>7.4</i>
	Observations	549	345	204	482	306	176	477	304	173
	Countries	20	19	19	17	16	17	17	16	17
All (ex RG1 and small countries and islands)	Mean	60.2	58.6	62.2	147.4	168.6	124.1	46.2	68.1	21.1
	SD	<i>7.1</i>	<i>6.8</i>	<i>6.9</i>	<i>522.1</i>	<i>668.7</i>	<i>283.9</i>	<i>620.3</i>	<i>662.8</i>	<i>567.1</i>
	Observations	4,324	2,389	1,935	3,254	1,701	1,553	3,977	2,119	1,858
	Countries	154	149	151	126	113	125	146	138	145

Table A 4.3: Economic structure (selected sector indicators) by countries in income classes and in sample periods before and after 2000

		Imports of merchandise goods/GDP (%)			Mining value added /GDP (%)			Natural resource exports/GDP (%)			Fuel exports/ Merchandise exports (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	31.9	30.9	33.0	5.5	5.0	5.8	6.2	5.3	6.8	10.9	10.2	11.4
	SD	20	22	17	9.3	8.3	10.0	9.7	9.1	10.0	22.4	21.7	22.9
	Observations	1,135	567	568	908	409	499	653	262	391	662	270	392
	Countries	66	62	58	62	53	56	56	50	49	56	51	49
LMIC	Mean	36.4	33.3	39.2	8.2	7.4	8.9	8.1	6.1	9.5	18.2	15.3	20.4
	SD	18	18	19	12.1	10.2	13.6	11.0	7.7	12.7	26.3	24.3	27.5
	Observations	953	459	494	837	398	439	735	309	426	745	318	427
	Countries	84	69	69	77	57	62	75	55	63	76	56	63
UMIC	Mean	36.6	31.1	39.6	7.8	7.0	8.3	8.3	6.9	9.0	17.6	16.6	18.1
	SD	20	22	19	11.1	10.8	11.2	11.3	11.2	11.2	27.0	27.6	26.7
	Observations	596	211	385	521	202	319	538	187	351	543	192	351
	Countries	57	32	50	54	29	47	52	29	46	52	29	46
HIC	Mean	36.5	31.4	40.1	2.4	1.9	2.9	4.0	2.8	4.7	7.1	5.4	8.3
	SD	31	29	31	6.4	3.4	8.5	5.5	4.5	6.0	11.7	9.6	12.8
	Observations	825	340	485	594	311	283	793	326	467	793	326	467
	Countries	44	31	44	40	31	38	42	31	42	42	31	42

		Ore and metal exports/ Merchandise exports (%)			Inbound tourism expenditure/GDP (%)			Inbound tourism travel revenue/GDP (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	12.6	9.7	14.6	0.5	0.5	0.5	0.6	0.6	0.7
	SD	<i>20.7</i>	<i>19.1</i>	<i>21.5</i>	<i>1.3</i>	<i>1.6</i>	<i>1.2</i>	<i>2.3</i>	<i>2.2</i>	<i>2.3</i>
	Observations	711	290	421	639	190	449	564	179	385
	Countries	57	51	50	53	45	48	53	46	44
LMIC	Mean	9.3	9.7	9.0	0.1	0.0	0.1	0.2	0.1	0.2
	SD	<i>14.4</i>	<i>15.0</i>	<i>14.0</i>	<i>0.2</i>	<i>0.1</i>	<i>0.2</i>	<i>0.6</i>	<i>0.3</i>	<i>0.6</i>
	Observations	752	323	429	455	117	338	581	142	439
	Countries	76	56	63	65	35	57	71	43	63
UMIC	Mean	6.7	4.9	7.7	0.0	0.0	0.0	0.0	0.0	0.0
	SD	<i>11.2</i>	<i>8.5</i>	<i>12.3</i>	<i>0.1</i>	<i>0.0</i>	<i>0.1</i>	<i>0.1</i>	<i>0.0</i>	<i>0.1</i>
	Observations	544	192	352	386	69	317	403	77	326
	Countries	52	29	46	49	21	44	48	22	44
HIC	Mean	4.5	3.8	4.9	0.0	0.0	0.0	0.0	0.0	0.0
	SD	<i>6.1</i>	<i>4.0</i>	<i>7.2</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
	Observations	796	327	469	570	125	445	525	117	408
	Countries	42	31	42	42	28	42	40	25	40

Table A 4.4: Economic structure (selected sector indicators) by countries in country groups and in sample periods before and after 2000

		Imports of merchandise goods/GDP (%)			Mining value added /GDP (%)			Natural resource exports/GDP (%)			Fuel exports/ Merchandise exports (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	23.8	21.7	26.9	1.3	1.0	1.8	1.7	1.2	2.3	5.4	4.7	6.3
	SD	12	12	10	0.9	0.7	0.9	4.1	2.4	5.5	9.3	8.1	10.6
	Observations	202	123	79	202	123	79	142	78	64	149	85	64
	Countries	7	6	7	7	6	7	6	6	6	6	6	6
Sub Saharan Africa	Mean	32.5	32.0	33.1	8.2	7.3	9.1	7.8	8.0	7.7	12.1	12.1	12.0
	SD	21	24	17	12.9	10.9	14.6	12.6	13.2	12.2	24.5	24.5	24.6
	Observations	1,231	697	534	979	500	479	642	254	388	646	257	389
	Countries	42	42	41	41	39	40	41	36	36	41	36	36
East and Southeast Asia	Mean	48.2	44.8	52.1	8.2	8.2	8.3	8.6	8.5	8.7	9.4	9.8	8.9
	SD	42	43	40	11.9	12.2	11.5	10.6	10.8	10.3	13.3	15.4	10.2
	Observations	458	246	212	401	233	168	371	201	170	373	203	170
	Countries	16	15	16	16	15	15	15	13	15	15	14	15
Latin America	Mean	30.6	28.1	33.6	5.2	5.0	5.5	5.5	4.1	6.9	13.3	10.1	16.8
	SD	20	21	18	6.2	6.0	6.4	7.2	6.1	7.9	21.1	18.2	23.4
	Observations	560	298	262	524	271	253	536	278	258	536	278	258
	Countries	20	20	20	20	19	20	20	20	20	20	20	20
Former USSR	Mean	45.2	40.0	47.2	5.3	2.4	6.0	12.3	7.2	13.6	24.2	17.7	26.0
	SD	20	21	20	10.6	4.5	11.6	13.0	7.0	13.8	27.1	21.7	28.2

	Observations	258	71	187	189	38	151	206	41	165	210	45	165
	Countries	15	15	14	13	7	13	14	13	13	14	13	13
Eastern Europe	Mean	44.7	37.3	48.2	4.6	8.5	1.8	3.9	2.6	4.3	6.1	5.1	6.6
	SD	<i>17</i>	<i>13</i>	<i>18</i>	<i>10.2</i>	<i>14.3</i>	<i>3.2</i>	<i>2.7</i>	<i>1.5</i>	<i>2.9</i>	<i>4.8</i>	<i>3.6</i>	<i>5.2</i>
	Observations	267	87	180	200	84	116	189	54	135	210	71	139
	Countries	14	11	14	12	10	11	11	9	11	11	9	11
Other Europe	Mean	30.9	28.8	34.0	2.5	2.9	1.8	3.2	2.5	4.1	7.1	6.1	8.5
	SD	<i>16</i>	<i>16</i>	<i>17</i>	<i>5.8</i>	<i>6.1</i>	<i>5.0</i>	<i>4.6</i>	<i>3.7</i>	<i>5.5</i>	<i>12.5</i>	<i>10.6</i>	<i>14.7</i>
	Observations	713	426	287	552	378	174	668	390	278	673	395	278
	Countries	21	21	21	20	20	20	20	20	20	20	20	20
Residual countries	Mean	27.7	26.4	29.8	9.7	8.7	12.1	8.3	7.5	9.7	25.4	24.0	27.5
	SD	<i>15</i>	<i>14</i>	<i>16</i>	<i>10.6</i>	<i>9.4</i>	<i>13.0</i>	<i>11.3</i>	<i>10.7</i>	<i>12.2</i>	<i>33.2</i>	<i>32.0</i>	<i>34.9</i>
	Observations	541	338	203	454	322	132	468	290	178	470	291	179
	Countries	20	19	19	19	18	16	19	19	18	19	19	18
All (ex RG1 and small countries and islands)	Mean	34.2	31.4	37.5	6.3	6.0	6.6	6.4	5.4	7.4	13.0	11.6	14.3
	SD	<i>23</i>	<i>24</i>	<i>22</i>	<i>10.4</i>	<i>9.5</i>	<i>11.3</i>	<i>9.8</i>	<i>9.0</i>	<i>10.3</i>	<i>22.3</i>	<i>21.2</i>	<i>23.4</i>
	Observations	4,230	2,286	1,944	3,501	1,949	1,552	3,222	1,586	1,636	3,267	1,625	1,642
	Countries	155	149	152	148	134	142	146	136	139	146	137	139

		Ore and metal exports/ Merchandise exports (%)			Inbound tourism expenditure/GDP (%)			Inbound tourism travel revenue/GDP (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	2.3	2.0	2.7	0.0	0.0	0.0	0.0	0.0	0.0
	SD	<i>2.9</i>	<i>2.6</i>	<i>3.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
	Observations	158	93	65	62	15	47	72	20	52
	Countries	6	6	6	5	3	5	5	4	5
Sub Saharan Africa	Mean	14.9	13.6	15.7	0.4	0.4	0.4	0.6	0.6	0.6
	SD	<i>22.3</i>	<i>22.9</i>	<i>21.9</i>	<i>1.4</i>	<i>1.7</i>	<i>1.2</i>	<i>2.4</i>	<i>2.5</i>	<i>2.3</i>
	Observations	692	278	414	559	144	415	522	140	382
	Countries	41	36	37	35	31	34	35	31	32
East and Southeast Asia	Mean	6.8	7.0	6.5	0.1	0.1	0.1	0.1	0.1	0.1
	SD	<i>14.0</i>	<i>14.2</i>	<i>13.9</i>	<i>0.3</i>	<i>0.3</i>	<i>0.3</i>	<i>0.3</i>	<i>0.2</i>	<i>0.3</i>
	Observations	378	203	175	193	46	147	225	48	177
	Countries	15	14	15	12	10	12	14	11	14
Latin America	Mean	10.0	10.8	9.3	0.1	0.1	0.1	0.1	0.0	0.1
	SD	<i>17.5</i>	<i>18.8</i>	<i>16.0</i>	<i>0.2</i>	<i>0.1</i>	<i>0.2</i>	<i>0.1</i>	<i>0.1</i>	<i>0.1</i>
	Observations	541	281	260	262	66	196	290	64	226
	Countries	20	20	20	18	14	17	20	14	20
Former USSR	Mean	8.1	6.6	8.5	0.2	0.2	0.2	0.2	0.1	0.2
	SD	<i>9.9</i>	<i>7.7</i>	<i>10.4</i>	<i>0.6</i>	<i>0.6</i>	<i>0.6</i>	<i>0.4</i>	<i>0.4</i>	<i>0.4</i>
	Observations	212	47	165	219	55	164	220	51	169
	Countries	14	13	13	14	13	13	14	13	13

Eastern Europe	Mean	6.3	5.5	6.7	0.0	0.0	0.0	0.0	0.0	0.0
	SD	<i>5.4</i>	<i>3.7</i>	<i>6.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
	Observations	210	71	139	201	33	168	182	37	145
	Countries	11	9	11	14	8	14	13	9	13
Other Europe	Mean	4.2	3.8	4.8	0.0	0.0	0.0	0.0	0.0	0.0
	SD	<i>4.8</i>	<i>3.3</i>	<i>6.4</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
	Observations	686	408	278	330	81	249	295	77	218
	Countries	20	20	20	21	19	20	18	17	17
Residual countries	Mean	7.6	8.3	6.6	0.1	0.3	0.1	0.2	0.1	0.2
	SD	<i>10.3</i>	<i>10.9</i>	<i>9.3</i>	<i>0.5</i>	<i>0.9</i>	<i>0.4</i>	<i>0.7</i>	<i>0.6</i>	<i>0.8</i>
	Observations	471	291	180	236	62	174	270	79	191
	Countries	19	19	18	18	13	17	19	17	18
All (ex RG1 and small countries and islands)	Mean	8.4	7.8	9.0	0.2	0.2	0.2	0.2	0.2	0.2
	SD	<i>14.8</i>	<i>14.5</i>	<i>15.0</i>	<i>0.8</i>	<i>1.0</i>	<i>0.7</i>	<i>1.2</i>	<i>1.3</i>	<i>1.2</i>
	Observations	3,348	1,672	1,676	2,062	502	1,560	2,076	516	1,560
	Countries	146	137	140	137	111	132	138	116	132

Table A 4.5: Indicators of informal (hard to tax) and formal sectors by countries in income classes and in sample periods before and after 2000

		Agricultural value added/ GDP (%)			Rural population share (%)			Paid employed labor force/ working age population (%)			Compensation of employees/ GDP (%)			Shadow economy/ 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	All	Before 2000	2000 and after
LIC	Mean	32.5	34.0	31.0	70.0	71.7	68.3	18.8	21.3	17.6	30.7	31.6	30.4	40.3	41.3	40.2
	SD	<i>12</i>	<i>12</i>	<i>11</i>	<i>12.4</i>	<i>12.2</i>	<i>12.4</i>	<i>11.2</i>	<i>10.3</i>	<i>11.4</i>	<i>20.0</i>	<i>17.4</i>	<i>20.9</i>	<i>9.3</i>	<i>10.2</i>	<i>9.2</i>
	Observations	1,076	531	545	1,156	588	568	180	59	121	268	65	203	416	53	363
	Countries	63	58	57	66	63	58	46	28	40	36	18	35	55	53	54
LMIC	Mean	14.4	15.7	13.2	47.7	47.4	48.1	30.8	34.0	29.0	44.8	38.1	47.9	38.5	38.1	38.5
	SD	<i>7</i>	<i>8</i>	<i>6</i>	<i>16.5</i>	<i>16.3</i>	<i>16.7</i>	<i>8.1</i>	<i>7.5</i>	<i>7.9</i>	<i>18.9</i>	<i>9.1</i>	<i>21.3</i>	<i>12.3</i>	<i>11.6</i>	<i>12.4</i>
	Observations	896	432	464	972	479	493	451	160	291	403	127	276	290	33	257
	Countries	83	65	67	84	70	68	69	40	54	60	30	51	50	33	49
UMIC	Mean	6.6	6.7	6.5	33.4	32.9	33.7	38.2	38.8	38.0	55.0	40.8	59.8	31.3	31.1	31.3
	SD	<i>3</i>	<i>4</i>	<i>3</i>	<i>16.9</i>	<i>18.6</i>	<i>15.9</i>	<i>7.9</i>	<i>7.5</i>	<i>8.0</i>	<i>22.9</i>	<i>6.9</i>	<i>24.4</i>	<i>9.7</i>	<i>10.9</i>	<i>9.6</i>
	Observations	562	182	380	606	221	385	430	106	324	370	93	277	204	21	183
	Countries	54	30	49	57	33	50	52	23	47	48	21	45	33	21	32
HIC	Mean	2.6	3.3	2.2	22.6	22.8	22.5	47.8	47.0	48.2	59.1	49.9	64.0	17.8	17.6	17.8
	SD	<i>2</i>	<i>2</i>	<i>2</i>	<i>11.5</i>	<i>9.9</i>	<i>12.6</i>	<i>7.8</i>	<i>8.2</i>	<i>7.5</i>	<i>21.0</i>	<i>5.8</i>	<i>24.3</i>	<i>6.2</i>	<i>6.1</i>	<i>6.2</i>
	Observations	692	238	454	772	319	453	695	230	465	707	247	460	264	27	237
	Countries	42	28	42	42	30	41	41	30	41	43	27	43	34	27	34

Table A 4.6: Indicators of informal (hard to tax) and formal sectors by countries in regional groups and in sample periods before and after 2000

		Agricultural value added/ GDP (%)			Rural population share (%)			Paid employed labor force/ working age population (%)			Compensation of employees/ GDP (%)			Shadow economy/ 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	All	Before 2000	2000 and after
South Asia	Mean	31.3	36.2	24.1	77.8	80.3	73.9	21.7	23.0	21.1	36.2	30.8	36.4	33.8	34.7	33.6
	SD	11.7	11.5	7.3	8.1	7.5	7.4	8.1	8.3	8.0	13.0	.	13.2	6.9	7.5	6.9
	Observations	172	103	69	202	123	79	49	16	33	27	1	26	54	6	48
	Countries	7	5	7	7	6	7	6	4	6	4	1	4	6	6	6
Sub Saharan Africa	Mean	28.7	30.2	26.9	68.4	70.7	65.3	19.3	16.6	19.9	33.0	32.4	33.2	40.6	41.1	40.5
	SD	14.8	14.8	14.7	13.4	13.1	13.2	14.3	12.0	14.8	20.2	12.9	22.6	7.5	7.5	7.5
	Observations	1,143	642	501	1,263	729	534	118	23	95	265	78	187	331	39	292
	Countries	40	38	40	42	42	41	33	18	30	26	12	26	40	39	39
East and Southeast Asia	Mean	17.2	19.0	15.0	57.3	59.9	53.7	39.3	40.3	38.9	48.7	42.9	52.6	28.5	29.9	28.4
	SD	14.2	13.9	14.2	22.2	21.3	22.8	14.2	13.9	14.4	20.6	10.6	24.5	14.1	15.2	14.1
	Observations	442	239	203	411	236	175	208	62	146	195	79	116	123	14	109
	Countries	16	14	16	14	14	13	14	11	14	14	7	14	14	14	14
Latin America	Mean	11.8	13.2	10.5	35.0	37.1	32.5	34.6	34.6	34.6	49.4	35.5	53.2	41.2	42.2	41.0
	SD	6.6	7.3	5.5	16.4	16.3	16.2	5.2	4.0	5.9	19.6	3.5	20.4	12.3	12.8	12.3
	Observations	508	247	261	560	298	262	339	134	205	249	54	195	175	20	155
	Countries	20	19	20	20	20	20	20	20	18	19	10	19	20	20	20
Former USSR	Mean	15.0	20.2	13.0	43.1	42.0	43.5	38.4	44.2	37.3	52.1	44.9	54.6	43.8	46.9	43.5
	SD	10.0	10.6	9.1	14.2	13.2	14.6	11.6	10.1	11.5	24.9	13.6	27.3	10.5	10.8	10.5
	Observations	258	71	187	272	85	187	171	27	144	234	59	175	105	11	94

	Countries	15	15	14	15	15	14	13	8	13	13	12	13	12	11	12
Eastern Europe	Mean	10.2	14.9	8.2	41.9	41.4	42.3	37.2	40.0	36.2	59.1	43.6	64.7	27.6	28.9	27.5
	SD	<i>8.9</i>	<i>12.7</i>	<i>5.6</i>	<i>9.2</i>	<i>9.4</i>	<i>9.1</i>	<i>7.7</i>	<i>6.6</i>	<i>7.9</i>	<i>25.2</i>	<i>5.6</i>	<i>27.1</i>	<i>6.2</i>	<i>6.9</i>	<i>6.2</i>
	Observations	256	76	180	287	108	179	208	54	154	179	48	131	81	9	72
	Countries	14	11	14	14	11	14	13	8	13	13	8	13	9	9	9
Other Europe	Mean	2.9	3.8	2.1	23.4	25.0	21.0	46.3	44.6	47.3	57.3	50.3	62.7	18.3	18.8	18.2
	SD	<i>1.9</i>	<i>1.9</i>	<i>1.5</i>	<i>11.4</i>	<i>11.5</i>	<i>10.9</i>	<i>8.7</i>	<i>9.4</i>	<i>8.1</i>	<i>19.8</i>	<i>6.1</i>	<i>24.5</i>	<i>6.0</i>	<i>6.3</i>	<i>6.0</i>
	Observations	525	247	278	708	430	278	441	163	278	503	220	283	180	20	160
	Countries	20	20	20	20	20	20	20	19	20	21	19	21	20	20	20
Residual countries	Mean	9.6	11.5	6.8	32.7	35.2	28.4	40.1	40.9	39.7	53.3	49.3	57.8	23.2	23.6	23.2
	SD	<i>6.9</i>	<i>7.4</i>	<i>5.0</i>	<i>19.6</i>	<i>19.7</i>	<i>18.6</i>	<i>13.4</i>	<i>12.3</i>	<i>13.9</i>	<i>17.6</i>	<i>8.6</i>	<i>23.1</i>	<i>9.0</i>	<i>9.3</i>	<i>9.0</i>
	Observations	424	248	176	549	345	204	225	76	149	232	122	110	125	15	110
	Countries	19	17	18	20	19	19	19	14	16	16	10	15	16	15	15
All (ex RG1 and small countries and islands)	Mean	17.1	19.9	14.4	47.7	49.9	45.1	38.1	38.9	37.7	50.7	44.9	53.8	33.2	34.2	33.1
	SD	<i>15</i>	<i>15</i>	<i>13</i>	<i>23.7</i>	<i>24.3</i>	<i>22.7</i>	<i>12.5</i>	<i>11.5</i>	<i>13.0</i>	<i>22.4</i>	<i>10.9</i>	<i>26.0</i>	<i>13.1</i>	<i>13.4</i>	<i>13.1</i>
	Observations	3,728	1,873	1,855	4,273	2,362	1,911	1,759	555	1,204	1,884	661	1,223	1,174	134	1,040
	Countries	151	139	149	152	148	148	138	102	130	126	79	125	137	134	135

Table A 4.7: Indicators of taxpayer capacity in countries in income classes and in sample periods before and after 2000

		Adult (25+ years) literacy rate (%)			Adult (25+) primary completion rate (%)			Primary completion rate (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	56.0	89.3	54.8	49.3	96.8	46.2	56.2	46.0	63.0
	SD	24.3	17.5	23.7	31.7	0.3	30.2	24.8	25.2	22.1
	Observations	89	3	86	33	2	31	667	266	401
	Countries	50	3	49	21	2	20	59	49	53
LMIC	Mean	84.2	99.8	83.9	69.0	90.8	68.8	85.2	79.8	89.6
	SD	14.9	0.0	14.9	20.1	.	20.1	18.4	19.7	15.9
	Observations	102	2	100	92	1	91	652	295	357
	Countries	47	2	45	36	1	35	75	57	61
UMIC	Mean	94.0	-	94.0	84.3	-	84.3	95.3	91.9	96.9
	SD	5.3	-	5.3	11.4	-	11.4	9.3	10.8	8.0
	Observations	94	-	94	127	-	127	446	145	301
	Countries	37	-	37	38	-	38	53	28	47
HIC	Mean	97.9	-	97.9	94.0	77.3	94.0	96.7	93.6	98.2
	SD	1.9	-	1.9	7.5	.	7.4	10.8	14.4	8.3
	Observations	27	-	27	173	1	172	412	131	281
	Countries	12	-	12	32	1	32	36	21	34

Table A 4.8: Indicators of taxpayer capacity in countries in regional groups and in sample periods before and after 2000

		Adult (25+ years) literacy rate (%)			Adult (25+ years) primary completion rate (%)			Primary completion rate (%)		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	59.3		59.3	48.9		48.9	75.2	66.5	79.1
	SD	18.4		18.4	14.1		14.1	19.6	24.7	15.6
	Observations	18		18	10		10	74	23	51
	Countries	5		5	3		3	6	5	6
Sub Saharan Africa	Mean	55.3	69.2	55.2	48.0		48.0	53.3	45.9	59.7
	SD	23.3	.	23.4	24.5		24.5	23.8	25.0	20.8
	Observations	86	1	85	38		38	689	318	371
	Countries	40	1	40	16		16	41	35	40
East and Southeast Asia	Mean	89.8		89.8	79.2		79.2	88.5	84.7	91.5
	SD	9.9		9.9	16.2		16.2	18.3	22.5	13.4
	Observations	32		32	41		41	213	95	118
	Countries	12		12	11		11	14	14	12
Latin America	Mean	91.0		91.0	71.3		71.3	89.2	79.9	95.4
	SD	6.2		6.2	13.3		13.3	14.7	15.3	10.4
	Observations	89		89	95		95	349	140	209
	Countries	19		19	18		18	20	18	20
Former USSR	Mean	99.8	99.6	99.8	98.5	94.8	98.8	97.3	93.2	98.3
	SD	0.2	0.3	0.2	1.5	3.5	0.9	6.7	7.3	6.2
	Observations	26	4	22	47	3	44	213	42	171
	Countries	13	4	13	13	3	13	14	14	14

Eastern Europe	Mean	98.9		98.9	96.3		96.3	96.4	95.4	97.0
	SD	<i>0.4</i>		<i>0.4</i>	<i>6.5</i>		<i>6.5</i>	<i>5.6</i>	<i>6.4</i>	<i>4.9</i>
	Observations	16		16	54		54	195	75	120
	Countries	8		8	13		13	12	9	12
Other Europe	Mean	98.3		98.3	93.5	77.3	93.7	96.5	94.0	98.5
	SD	<i>1.7</i>		<i>1.7</i>	<i>7.3</i>	.	<i>7.1</i>	<i>10.6</i>	<i>14.5</i>	<i>4.8</i>
	Observations	18		18	103	1	102	338	153	185
	Countries	6		6	15	1	15	19	17	18
Residual countries	Mean	86.3		86.3	84.9		84.9	83.8	78.0	90.6
	SD	<i>9.6</i>		<i>9.6</i>	<i>15.1</i>		<i>15.1</i>	<i>21.2</i>	<i>22.0</i>	<i>18.0</i>
	Observations	29		29	39		39	251	136	115
	Countries	8		8	9		9	16	15	14
All (ex RG1 and small countries and islands)	Mean	80.4	93.5	80.2	82.2	90.4	82.1	79.9	72.7	85.1
	SD	<i>22.5</i>	<i>13.6</i>	<i>22.5</i>	<i>20.1</i>	<i>9.2</i>	<i>20.1</i>	<i>25.2</i>	<i>28.1</i>	<i>21.5</i>
	Observations	314	5	309	427	4	423	2,322	982	1,340
	Countries	111	5	111	98	4	98	142	127	136

Table A 4.9: Governance indicators using ICRG Country Political Risk indicators of political, economic and financial management for countries in income classes and in sample periods before and after 2000

		Government stability			Socioeconomic conditions			Investment profile			Internal conflict			External conflict			Corruption		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	6.2	5.3	7.3	3.3	3.9	2.6	5.1	4.4	5.7	6.5	6.0	6.9	7.6	7.4	8.0	3.9	4.4	3.3
	SD	<i>2.0</i>	<i>2.0</i>	<i>1.2</i>	<i>1.3</i>	<i>1.3</i>	<i>1.0</i>	<i>1.6</i>	<i>1.5</i>	<i>1.5</i>	<i>1.9</i>	<i>2.3</i>	<i>1.2</i>	<i>1.6</i>	<i>1.9</i>	<i>1.2</i>	<i>1.6</i>	<i>1.8</i>	<i>1.2</i>
	Obs	835	431	404	835	431	404	835	431	404	835	431	404	835	431	404	835	431	404
	Countries	47	46	41	47	46	41	47	46	41	47	46	41	47	46	41	47	46	41
LMIC	Mean	6.4	5.7	7.0	4.1	4.5	3.8	5.7	4.9	6.4	7.2	7.0	7.3	8.3	8.2	8.3	4.4	5.3	3.5
	SD	<i>1.7</i>	<i>1.7</i>	<i>1.3</i>	<i>1.2</i>	<i>1.2</i>	<i>1.2</i>	<i>1.6</i>	<i>1.4</i>	<i>1.3</i>	<i>1.8</i>	<i>2.2</i>	<i>1.3</i>	<i>1.4</i>	<i>1.8</i>	<i>0.9</i>	<i>1.5</i>	<i>1.4</i>	<i>1.0</i>
	Obs	775	374	401	775	374	401	775	374	401	775	374	401	775	374	401	775	374	401
	Countries	66	56	54	66	56	54	66	56	54	66	56	54	66	56	54	66	56	54
UMIC	Mean	6.6	6.3	6.8	5.0	5.2	4.9	6.7	5.6	7.3	8.0	8.0	8.0	8.5	8.8	8.4	4.7	5.8	4.1
	SD	<i>1.4</i>	<i>1.5</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.3</i>	<i>1.8</i>	<i>1.3</i>	<i>1.7</i>	<i>1.3</i>	<i>1.7</i>	<i>1.1</i>	<i>1.3</i>	<i>1.7</i>	<i>1.0</i>	<i>1.7</i>	<i>1.8</i>	<i>1.2</i>
	Obs	539	196	343	539	196	343	539	196	343	539	196	343	539	196	343	539	196	343
	Countries	51	29	45	51	29	45	51	29	45	51	29	45	51	29	45	51	29	45
HIC	Mean	6.8	6.6	7.0	6.7	6.1	7.2	7.8	6.2	9.0	9.0	9.3	8.8	8.9	9.3	8.7	7.5	8.5	6.9
	SD	<i>1.4</i>	<i>1.5</i>	<i>1.2</i>	<i>1.2</i>	<i>1.1</i>	<i>1.2</i>	<i>1.9</i>	<i>1.3</i>	<i>1.1</i>	<i>1.2</i>	<i>1.3</i>	<i>1.0</i>	<i>1.2</i>	<i>1.2</i>	<i>1.0</i>	<i>1.8</i>	<i>1.5</i>	<i>1.8</i>
	Obs	786	330	456	786	330	456	786	330	456	786	330	456	786	330	456	786	330	456
	Countries	41	30	41	41	30	41	41	30	41	41	30	41	41	30	41	41	30	41

		Military in politics			Religion in politics			Law and order			Ethnic tensions			Democratic Accountability			Bureaucracy quality			Composite		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	4.0	4.0	3.9	6.8	7.1	6.6	4.8	4.7	5.0	5.2	5.2	5.3	4.9	4.5	5.4	3.2	3.4	3.0	51.4	50.3	52.6
	SD	2.5	2.7	2.4	2.3	2.4	2.3	1.7	1.8	1.6	2.2	2.4	1.9	2.2	2.1	2.3	2.1	2.2	1.9	10.6	12.1	8.6
	Obs	835	431	404	835	431	404	835	431	404	835	431	404	835	431	404	835	431	404	835	431	404
	Countries	47	46	41	47	46	41	47	46	41	47	46	41	47	46	41	47	46	41	47	46	41
LMIC	Mean	5.5	5.6	5.5	7.4	7.4	7.4	5.4	5.6	5.2	6.6	6.8	6.4	5.9	5.8	5.9	4.5	4.7	4.4	59.5	59.6	59.4
	SD	2.4	2.5	2.3	2.4	2.2	2.5	2.0	2.2	1.8	2.3	2.3	2.3	2.2	1.9	2.4	1.8	2.1	1.5	9.1	10.6	7.6
	Obs	775	374	401	775	374	401	775	374	401	775	374	401	775	374	401	775	374	401	775	374	401
	Countries	66	56	54	66	56	54	66	56	54	66	56	54	66	56	54	66	56	54	66	56	54
UMIC	Mean	7.2	7.3	7.2	8.2	8.2	8.2	6.1	6.5	5.9	7.4	7.8	7.1	7.2	6.7	7.5	5.8	6.2	5.6	67.9	68.7	67.4
	SD	2.2	2.1	2.4	1.6	1.8	1.4	1.8	2.1	1.6	2.0	2.1	1.9	2.2	1.9	2.3	1.8	1.9	1.6	9.0	10.0	8.3
	Obs	539	196	343	539	196	343	539	196	343	539	196	343	539	196	343	539	196	343	539	196	343
	Countries	51	29	45	51	29	45	51	29	45	51	29	45	51	29	45	51	29	45	51	29	45
HIC	Mean	9.3	9.4	9.2	8.9	9.2	8.7	9.0	9.3	8.7	7.8	8.3	7.4	9.3	9.2	9.3	9.2	9.5	9.0	83.6	84.1	83.2
	SD	1.3	1.4	1.3	1.5	1.6	1.4	1.3	1.3	1.2	2.0	2.0	1.9	1.6	1.6	1.5	1.2	0.9	1.4	7.8	8.6	7.3
	Obs	786	330	456	786	330	456	786	330	456	786	330	456	786	330	456	786	330	456	786	330	456
	Countries	41	30	41	41	30	41	41	30	41	41	30	41	41	30	41	41	30	41	41	30	41

Table A 4.10: Governance indicators using ICRG Country Political Risk indicators of political, economic and financial management for countries in income classes and in sample periods before and after 2000

		Government stability			Socioeconomic conditions			Investment profile			Internal conflict			External conflict			Corruption		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	5.6	4.7	6.8	3.9	4.2	3.5	5.2	4.6	5.9	5.0	4.5	5.6	7.2	6.8	7.7	3.8	3.8	3.7
	SD	2.0	2.1	1.2	1.2	1.2	1.1	1.3	1.0	1.2	2.2	2.6	1.2	1.8	2.0	1.1	1.4	1.7	1.1
	Obs	118	64	54	118	64	54	118	64	54	118	64	54	118	64	54	118	64	54
	Countries	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sub Saharan Africa	Mean	6.2	5.1	7.3	3.4	4.0	2.7	5.3	4.6	6.1	6.5	6.0	7.1	7.6	7.1	8.1	4.1	4.6	3.5
	SD	1.9	1.9	1.2	1.3	1.2	1.1	1.7	1.5	1.5	1.9	2.2	1.2	1.7	2.0	1.2	1.7	1.9	1.2
	Obs	831	432	399	831	432	399	831	432	399	831	432	399	831	432	399	831	432	399
	Countries	31	31	30	31	31	30	31	31	30	31	31	30	31	31	30	31	31	30
East and Southeast Asia	Mean	6.6	5.9	7.3	5.4	5.4	5.4	6.1	5.2	7.2	7.9	7.9	8.0	8.4	8.4	8.5	4.8	5.5	4.1
	SD	1.9	1.9	1.4	1.9	1.7	2.0	2.0	1.6	1.9	1.7	2.0	1.1	1.2	1.4	0.9	2.0	1.9	1.7
	Obs	360	188	172	360	188	172	360	188	172	360	188	172	360	188	172	360	188	172
	Countries	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Latin America	Mean	6.1	5.6	6.5	4.3	4.6	4.1	5.8	5.1	6.5	7.0	6.6	7.5	8.4	8.4	8.4	4.6	5.1	4.0
	SD	1.5	1.6	1.2	1.2	1.1	1.3	1.8	1.4	1.8	1.7	2.1	1.2	1.3	1.8	0.7	1.5	1.6	1.3
	Obs	481	232	249	481	232	249	481	232	249	481	232	249	481	232	249	481	232	249
	Countries	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Former USSR	Mean	7.3	8.2	7.3	4.5	2.6	4.7	6.7	4.9	6.9	8.1	7.7	8.1	8.0	8.1	8.0	3.5	4.9	3.3
	SD	1.3	0.8	1.3	1.5	0.8	1.4	1.6	1.6	1.5	1.0	1.0	1.0	1.1	1.2	1.0	1.2	1.7	1.1

	Obs	148	12	136	148	12	136	148	12	136	148	12	136	148	12	136	148	12	136
	Countries	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Eastern Europe	Mean	6.2	5.9	6.3	4.4	4.3	4.5	6.9	5.1	7.9	8.8	9.2	8.6	8.8	9.1	8.7	5.1	6.7	4.2
	SD	<i>1.3</i>	<i>1.7</i>	<i>1.0</i>	<i>1.3</i>	<i>1.2</i>	<i>1.3</i>	<i>2.1</i>	<i>1.7</i>	<i>1.5</i>	<i>1.0</i>	<i>1.1</i>	<i>0.9</i>	<i>1.0</i>	<i>1.3</i>	<i>0.7</i>	<i>1.7</i>	<i>1.2</i>	<i>1.0</i>
	Obs	219	81	138	219	81	138	219	81	138	219	81	138	219	81	138	219	81	138
	Countries	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11
Other Europe	Mean	6.9	6.7	7.0	6.8	6.2	7.4	7.6	6.3	9.1	9.0	9.1	8.8	9.2	9.5	8.9	7.9	8.5	7.3
	SD	<i>1.3</i>	<i>1.4</i>	<i>1.1</i>	<i>1.3</i>	<i>1.2</i>	<i>1.1</i>	<i>1.9</i>	<i>1.4</i>	<i>1.2</i>	<i>1.2</i>	<i>1.4</i>	<i>0.9</i>	<i>1.1</i>	<i>1.1</i>	<i>0.9</i>	<i>1.7</i>	<i>1.6</i>	<i>1.7</i>
	Obs	587	309	278	587	309	278	587	309	278	587	309	278	587	309	278	587	309	278
	Countries	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Residual countries	Mean	6.7	6.3	7.4	5.2	5.0	5.5	6.2	5.2	7.5	7.5	7.4	7.6	7.8	7.7	7.9	5.7	6.2	5.1
	SD	<i>1.6</i>	<i>1.6</i>	<i>1.3</i>	<i>1.5</i>	<i>1.4</i>	<i>1.6</i>	<i>2.0</i>	<i>1.5</i>	<i>1.9</i>	<i>2.0</i>	<i>2.3</i>	<i>1.4</i>	<i>1.9</i>	<i>2.2</i>	<i>1.3</i>	<i>2.2</i>	<i>2.1</i>	<i>2.2</i>
	Obs	429	245	184	429	245	184	429	245	184	429	245	184	429	245	184	429	245	184
	Countries	18	18	17	18	18	17	18	18	17	18	18	17	18	18	17	18	18	17
All (ex RG1 and small countries and islands)	Mean	6.4	5.8	7.0	4.8	4.9	4.7	6.2	5.2	7.2	7.5	7.3	7.8	8.2	8.1	8.3	5.2	5.9	4.5
	SD	<i>1.7</i>	<i>1.8</i>	<i>1.3</i>	<i>1.8</i>	<i>1.5</i>	<i>2.1</i>	<i>2.0</i>	<i>1.6</i>	<i>1.9</i>	<i>2.0</i>	<i>2.4</i>	<i>1.4</i>	<i>1.6</i>	<i>2.0</i>	<i>1.1</i>	<i>2.3</i>	<i>2.3</i>	<i>2.0</i>
	Obs	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610
	Countries	126	124	124	126	124	124	126	124	124	126	124	124	126	124	124	126	124	124

		Military in politics			Religion in politics			Law and order			Ethnic tensions			Democratic Accountability			Bureaucracy quality			Composite		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	4.2	4.6	3.7	4.0	4.4	3.5	4.3	3.6	5.0	3.5	3.3	3.8	6.0	5.8	6.2	5.1	4.7	5.6	48.1	45.9	50.8
	SD	2.6	3.0	2.0	1.8	1.9	1.5	1.8	2.0	1.3	2.2	2.4	2.0	2.4	1.9	2.9	1.9	2.3	1.1	9.8	11.3	6.9
	Obs	118	64	54	118	64	54	118	64	54	118	64	54	118	64	54	118	64	54	118	64	54
	Countries	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Sub Saharan Africa	Mean	4.3	4.4	4.2	7.1	7.4	6.8	4.8	4.6	5.0	5.1	5.0	5.3	5.0	4.4	5.6	3.4	3.9	2.9	52.3	50.9	53.8
	SD	2.8	2.8	2.8	2.2	2.1	2.2	1.8	1.9	1.7	1.9	2.0	1.8	2.0	2.0	1.9	2.4	2.7	1.9	11.7	12.8	10.2
	Obs	831	432	399	831	432	399	831	432	399	831	432	399	831	432	399	831	432	399	831	432	399
	Countries	31	31	30	31	31	30	31	31	30	31	31	30	31	31	30	31	31	30	31	31	30
East and Southeast Asia	Mean	6.1	5.9	6.3	7.8	8.1	7.3	6.4	6.4	6.3	6.9	6.6	7.1	5.7	5.6	5.7	6.1	5.8	6.4	65.1	64.1	66.2
	SD	2.8	3.2	2.3	2.2	2.0	2.3	2.0	2.2	1.8	2.5	2.7	2.3	2.8	2.6	2.9	2.6	3.0	2.1	13.5	14.7	12.0
	Obs	360	188	172	360	188	172	360	188	172	360	188	172	360	188	172	360	188	172	360	188	172
	Countries	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
Latin America	Mean	5.6	5.4	5.7	8.9	8.6	9.1	4.7	5.0	4.4	7.6	7.9	7.4	6.9	6.2	7.6	4.6	4.0	5.1	62.0	60.3	63.6
	SD	2.4	2.5	2.3	1.1	1.1	1.0	1.7	1.8	1.6	2.0	2.0	2.0	1.8	1.7	1.7	1.9	2.1	1.5	9.5	10.7	7.9
	Obs	481	232	249	481	232	249	481	232	249	481	232	249	481	232	249	481	232	249	481	232	249
	Countries	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
Former USSR	Mean	7.5	7.8	7.4	8.5	8.7	8.5	6.7	6.6	6.7	6.5	7.1	6.4	5.8	6.2	5.8	4.0	3.8	4.0	64.2	63.7	64.3
	SD	1.1	0.8	1.1	0.8	0.8	0.8	0.9	0.8	0.9	1.8	1.8	1.8	2.7	2.2	2.7	1.7	1.7	1.7	6.7	7.2	6.6
	Obs	148	12	136	148	12	136	148	12	136	148	12	136	148	12	136	148	12	136	148	12	136
	Countries	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Eastern Europe	Mean	8.5	8.2	8.8	8.4	8.5	8.4	7.1	8.0	6.6	7.4	8.1	6.9	8.3	7.2	9.0	6.0	5.6	6.3	71.7	71.5	71.8
	SD	1.6	2.0	1.3	1.3	1.9	0.9	1.6	1.5	1.4	1.6	1.4	1.5	1.7	1.8	1.1	2.1	2.4	1.9	8.6	10.2	7.6
	Obs	219	81	138	219	81	138	219	81	138	219	81	138	219	81	138	219	81	138	219	81	138
	Countries	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11	11	9	11
Other Europe	Mean	9.4	9.2	9.6	8.9	9.0	8.8	9.0	9.0	9.0	8.1	8.6	7.6	9.4	9.1	9.8	9.1	9.0	9.2	84.5	83.7	85.4
	SD	1.3	1.6	0.7	1.4	1.5	1.3	1.4	1.6	1.2	1.8	1.8	1.7	1.1	1.4	0.6	1.4	1.5	1.2	8.3	9.6	6.3
	Obs	587	309	278	587	309	278	587	309	278	587	309	278	587	309	278	587	309	278	587	309	278
	Countries	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20
Residual countries	Mean	6.5	6.5	6.5	6.7	6.3	7.1	7.0	6.8	7.3	6.7	6.8	6.5	6.7	6.6	6.9	6.5	6.4	6.6	66.1	64.4	68.4
	SD	2.7	2.7	2.7	2.6	2.7	2.5	2.4	2.6	2.0	2.2	2.3	2.2	2.9	2.8	3.1	2.7	2.6	2.7	15.3	16.1	13.7
	Obs	429	245	184	429	245	184	429	245	184	429	245	184	429	245	184	429	245	184	429	245	184
	Countries	18	18	17	18	18	17	18	18	17	18	18	17	18	18	17	18	18	17	18	18	17
All (ex RG1 and small countries and islands)	Mean	6.4	6.3	6.5	7.8	7.8	7.8	6.3	6.3	6.3	6.6	6.7	6.5	6.7	6.3	7.1	5.7	5.7	5.6	64.8	63.4	66.1
	SD	3.0	3.1	2.9	2.2	2.3	2.1	2.4	2.6	2.2	2.4	2.6	2.2	2.7	2.6	2.6	2.9	3.1	2.8	15.9	17.3	14.3
	Obs	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610	3,173	1,563	1,610
	Countries	126	124	124	126	124	124	126	124	124	126	124	124	126	124	124	126	124	124	126	124	124

Table A 4.11: Correlation coefficients between and within components of World Governance Index and ICRG Optical Risk Index

	World Governance Index (WGI) Components						ICRG Political Risk Index Components											
	Voice & Accountability	Political Stability	Government Effectiveness	Regulatory Quality	Rule of Law	Control of Corruption	Government Stability	Socioeconomic Conditions	Investment Profile	Internal Conflict	External Conflict	Corruption	Military in Politics	Religion in Politics	Law and Order	Ethnic Tensions	Democratic Accountability	Bureaucracy Quality
Voice & Accountability	1																	
Political Stability	0.674	1																
Government Effectiveness	0.818	0.750	1															
Regulatory Quality	0.843	0.729	0.939	1														
Rule of Law	0.816	0.796	0.958	0.926	1													
Control of Corruption	0.790	0.766	0.945	0.887	0.949	1												
Government Stability	0.109	0.214	0.087	0.057	0.09	0.113	1											
Socioeconomic Conditions	0.595	0.682	0.843	0.796	0.822	0.802	0.147	1										
Investment Profile	0.609	0.606	0.715	0.781	0.720	0.664	0.189	0.676	1									
Internal Conflict	0.527	0.828	0.582	0.564	0.607	0.577	0.216	0.564	0.476	1								
External Conflict	0.453	0.566	0.404	0.445	0.412	0.378	0.156	0.327	0.381	0.532	1							
Corruption	0.706	0.631	0.789	0.735	0.801	0.852	0.097	0.640	0.491	0.485	0.369	1						
Military in Politics	0.740	0.744	0.755	0.753	0.709	0.709	0.043	0.665	0.613	0.649	0.586	0.496	1					
Religion in Politics	0.429	0.531	0.333	0.354	0.328	0.350	0.027	0.281	0.231	0.484	0.287	0.333	0.405	1				
Law and Order	0.491	0.673	0.714	0.648	0.782	0.726	0.175	0.698	0.491	0.584	0.252	0.654	0.610	0.269	1			
Ethnic Tensions	0.226	0.550	0.327	0.305	0.352	0.343	0.159	0.353	0.241	0.494	0.249	0.264	0.392	0.380	0.398	1		
Democratic Accountability	0.844	0.405	0.587	0.627	0.574	0.534	0.232	0.377	0.458	0.333	0.327	0.511	0.563	0.277	0.301	0.070	1	

Bureaucracy Quality	0.747 5	0.618 7	0.899 2	0.815 2	0.837 1	0.821 8	0.002 8	0.765 8	0.602 8	0.489 6	0.373	0.710 5	0.697 5	0.265 7	0.615 1	0.257 5	0.574 9	1
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Table A 4.12: Tax rate indicators for countries in income classes and in sample periods before and after 2000

		Trade weighted import tariff rate (%)			Top combined personal income tax (PIT) rate (%)			Combined corporate income tax (CIT) rate (%)			VAT/GST rate (%)			Domestic tax rate indicator		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
LIC	Mean	11.7	19.8	10.3	33.2	38.5	32.4	32.2	39.1	30.3	15.4	16.7	15.0	38.6	44.9	37.1
	SD	7.8	14.3	4.8	8.2	6.5	8.1	6.4	6.5	4.9	4.7	7.2	3.5	4.5	5.0	2.8
	Observations	495	72	423	202	28	174	255	56	199	180	43	137	121	23	98
	Countries	63	36	57	31	4	30	37	10	35	25	5	24	19	3	18
LMIC	Mean	7.8	9.9	7.0	28.4	31.2	27.9	28.8	33.9	27.8	13.5	11.9	14.1	34.7	36.2	34.5
	SD	5.6	7.0	4.8	9.8	8.0	10.0	7.3	5.6	7.1	4.0	4.0	3.8	4.6	4.5	4.6
	Observations	546	144	402	382	64	318	385	59	326	330	93	237	225	27	198
	Countries	75	40	65	56	17	52	56	21	53	48	18	40	35	8	35
UMIC	Mean	5.6	8.1	4.6	28.7	37.8	27.1	26.3	35.9	24.0	16.9	17.1	16.9	35.1	41.7	34.5
	SD	4.2	4.8	3.5	11.1	6.4	11.0	9.8	8.8	8.5	4.5	4.7	4.5	6.0	4.0	5.8
	Observations	471	127	344	378	57	321	412	80	332	372	64	308	310	25	285
	Countries	54	26	49	45	15	44	47	19	45	44	13	42	43	10	42
HIC	Mean	2.5	4.4	1.6	42.2	51.0	40.5	31.3	38.3	27.4	17.3	14.9	17.7	41.1	47.4	40.8
	SD	2.1	2.1	1.5	10.5	7.7	10.1	9.7	8.9	7.7	5.6	6.2	5.4	5.5	4.3	5.4
	Observations	711	243	468	537	83	454	732	261	471	475	68	407	423	16	407
	Countries	43	30	43	42	20	42	43	30	43	40	23	40	40	9	40

Table A 4.13: Tax rate indicators for countries in regional groups and in sample periods before and after 2000

		Trade weighted import tariff rate (%)			Top combined personal income tax (PIT) rate (%)			Combined corporate income tax (CIT) rate (%)			VAT/GST rate (%)			Domestic tax rate indicator		
		All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after	All	Before 2000	2000 and after
South Asia	Mean	16.6	33.7	12.6	26.6	-	26.6	33.9	36.4	33.3	14.2	-	14.2	36.1	-	36.1
	SD	13.4	21.4	5.5	4.8	-	4.8	3.6	3.4	3.5	1.6	-	1.6	2.1	-	2.1
	Obs	88	17	71	39	-	39	67	12	55	37	-	37	35	-	35
	Countries	7	6	7	5	-	5	5	4	5	4	-	4	4	-	4
Sub Saharan Africa	Mean	10.3	15.8	9.6	33.7	41.3	32.8	32.6	42.2	30.5	16.1	18.2	15.4	38.3	45.7	36.4
	SD	5.2	6.3	4.6	9.7	5.7	9.7	7.6	7.1	5.8	4.2	6.2	2.9	6.0	4.2	4.9
	Obs	454	49	405	262	29	233	302	56	246	196	51	145	144	29	115
	Countries	42	24	41	28	3	28	28	5	28	19	4	19	15	3	15
East and Southeast Asia	Mean	6.1	12.2	4.4	33.8	34.3	33.8	28.9	34.2	27.3	9.6	9.2	9.6	36.0	37.9	35.8
	SD	6.3	8.9	3.9	9.6	1.4	10.0	7.9	9.0	6.9	2.8	2.3	2.9	5.2	0.8	5.5
	Obs	248	55	193	140	12	128	212	48	164	117	18	99	107	12	95
	Countries	16	11	16	14	1	14	15	11	15	11	3	11	11	1	11
Latin America	Mean	7.8	11.1	6.5	29.3	31.1	28.7	29.1	30.2	28.9	14.4	13.8	14.7	36.0	36.7	35.9
	SD	3.7	3.1	3.2	7.1	8.1	6.7	6.3	6.6	6.3	4.7	5.1	4.4	4.3	4.5	4.3
	Obs	342	94	248	255	59	196	238	33	205	355	138	217	209	31	178
	Countries	20	20	20	17	15	17	17	13	17	17	17	17	17	12	17
	Mean	3.6	4.6	3.3	21.7	28.0	20.9	20.5	27.5	20.2	18.0	18.0	18.0	31.6	-	31.6

Former USSR	SD	2.5	2.1	2.5	7.1	3.7	7.0	5.7	1.6	5.6	2.6	.	2.7	2.8	-	2.8
	Obs	173	34	139	133	15	118	116	6	110	94	1	93	78	-	78
	Countries	15	9	14	12	3	12	11	2	11	10	1	10	9	-	9
Eastern Europe	Mean	3.1	4.3	2.5	28.4	41.7	25.6	21.7	35.8	17.9	20.3	23.8	20.2	34.2	44.2	34.0
	SD	2.1	1.5	2.1	14.5	4.3	14.4	9.9	8.1	6.2	2.4	1.6	2.3	6.5	3.0	6.5
	Obs	218	67	151	182	32	150	197	42	155	154	5	149	139	2	137
	Countries	13	8	13	13	8	13	13	7	13	14	4	14	13	2	13
Other Europe	Mean	2.6	4.2	1.4	45.1	50.3	43.5	34.7	41.4	28.0	19.2	18.3	19.4	42.7	47.2	42.4
	SD	1.7	1.3	0.5	8.0	8.4	7.2	10.9	9.8	7.2	4.0	3.8	4.0	4.6	4.2	4.5
	Obs	495	218	277	363	85	278	559	281	278	336	70	266	283	17	266
	Countries	20	20	20	20	19	20	20	20	20	20	18	20	20	10	20
Residual countries	Mean	7.5	9.8	6.8	36.5	-	36.5	33.7	40.5	29.4	11.3	9.2	12.4	39.1	-	39.1
	SD	7.2	8.5	6.6	11.2	-	11.2	8.8	6.1	7.4	4.6	4.0	4.6	5.5	-	5.5
	Obs	209	53	156	125	-	125	197	76	121	128	43	85	84	-	84
	Countries	19	14	18	12	-	12	13	6	13	10	5	10	10	-	10
All (ex RG1 and small countries and islands)	Mean	6.5	8.4	5.8	34.1	40.8	32.8	30.7	39.4	27.0	16.0	14.8	16.3	37.8	41.9	37.4
	SD	6.2	8.2	5.1	11.9	10.9	11.7	10.0	9.3	7.7	5.1	5.9	4.8	6.1	6.1	6.0
	Obs	2,227	587	1,640	1,499	232	1,267	1,888	554	1,334	1,417	326	1,091	1,079	91	988
	Countries	152	112	149	121	49	121	122	68	122	105	52	105	99	28	99

Annex 5: Tax and revenue capacity and effort

Table A 5.1: Taxes (including Social Security Contributions), Non-Tax Revenue and Domestic Revenue as shares of GDP (%) for oil revenue dominated (RG1) and resource dependent (RG2) countries, mean and standard deviations for sample years (Countries are ranked by descending values of non-tax revenues as shares of GDP)

Country group	Country	Taxes (including SSC) (%)		Non-tax revenue (%)		Domestic revenues (%)	
		Mean	SD	Mean	SD	Mean	SD
Oil revenue dominated (RG1)							
	Kuwait	1.6	1.4	58.1	15.3	59.7	15.9
	Iraq	0.8	0.4	47.5	4.9	48.3	4.6
	Qatar	2.5	1.4	37.0	4.5	39.5	4.0
	Libya	5.7	3.4	31.3	20.4	36.9	19.7
	Saudi Arabia	1.5	0.3	29.3	5.0	31.0	4.8
	United Arab Emirates	0.8	0.3	26.7	6.6	27.6	6.6
	Brunei	24.7	6.0	19.4	2.7	44.1	7.6
Resource dependent (RG2)							
	Congo, Rep.	14.0	10.8	22.9	9.9	36.9	15.3
	Algeria	11.7	3.0	22.4	7.3	34.1	5.3
	Oman	7.7	1.0	21.6	2.4	29.4	3.1
	Equatorial Guinea	14.8	5.8	18.3	10.2	33.0	9.8
	Yemen	7.2	0.7	17.4	10.0	24.7	10.2
	Iran	7.4	1.8	15.5	8.0	23.3	9.3
	Nigeria	8.5	1.7	15.1	5.3	23.6	6.6
	Azerbaijan	15.5	1.9	14.7	10.9	30.1	10.9
	Norway	41.7	1.7	14.3	1.7	55.9	2.0
	Russia	30.2	5.8	11.3	4.2	41.1	9.2
	Syria	15.0	2.7	11.2	6.3	26.2	4.8
	Botswana	30.2	5.4	11.0	4.5	41.2	5.5
	Ecuador	11.5	3.3	8.9	1.9	18.6	3.1
	Mauritania	12.6	1.3	8.2	4.1	20.8	3.6
	Gabon	19.5	5.3	7.1	2.2	26.6	7.0
	Bulgaria	32.2	5.9	7.0	2.7	39.2	7.9
	Colombia	14.3	3.5	6.9	1.8	21.2	4.6
	Egypt	12.9	1.2	6.7	1.7	19.6	2.8
	Trinidad and Tobago	22.5	4.3	5.6	3.2	28.2	4.7
	Cameroon	10.8	1.7	5.5	2.5	16.3	3.3
	Chile	19.9	2.6	5.3	1.4	25.2	3.6
	Sudan	6.8	1.9	5.2	4.9	12.0	5.2
	Tunisia	23.7	1.9	4.5	2.0	28.2	2.0
	Venezuela	14.3	2.0	4.1	1.1	19.5	0.7

Zimbabwe	20.5	7.4	4.0	3.5	24.0	10.2
Morocco	20.1	1.7	3.9	1.4	23.2	2.0
Mongolia	22.8	6.5	3.9	1.7	26.7	6.0
Angola	34.5	10.2	3.8	4.7	35.8	9.2
China	17.1	4.2	3.5	4.6	20.6	5.4
Suriname	15.8	3.9	3.4	1.8	19.2	4.7
Turkmenistan	17.0	2.5	3.4	1.6	20.3	3.6
Namibia	27.3	3.0	3.1	0.8	30.7	2.8
Papua New Guinea	21.8	3.7	3.1	1.5	24.9	3.0
Togo	16.3	5.0	2.9	2.4	19.3	7.3
Bolivia	21.7	5.3	2.7	1.0	24.4	5.9
Romania	28.6	2.9	2.5	0.6	31.1	3.0
Indonesia	13.1	1.7	2.1	1.6	15.2	1.3
Chad	7.2	4.1	1.8	1.9	9.0	5.7
Tajikistan	15.1	3.1	1.7	1.0	16.7	4.0
Liberia	17.4	5.5	1.7	1.8	19.1	6.0
Kazakhstan	21.3	5.2	1.7	0.9	23.0	5.0
Mexico	15.0	1.6	1.6	0.9	16.6	1.8
Zambia	17.2	2.7	1.4	1.1	18.6	3.6
Peru	15.1	2.9	1.4	0.7	14.1	4.1
Ghana	10.8	2.6	1.3	0.8	12.0	2.8
Niger	10.0	2.6	1.2	0.7	11.2	2.9
Central African Republic	9.4	1.9	1.2	0.6	10.5	2.1
Guinea	11.0	4.1	1.1	0.7	12.1	3.9
Congo, Dem. Rep.	5.9	3.6	1.0	0.8	6.9	4.2
Sierra Leone	6.9	2.5	0.4	0.3	7.3	2.7

Table A 5.2: Average standard deviation of estimates of Tax Effort (TE) and Domestic Revenue Effort (RE) of countries by income group and by estimates of tax capacity by basic specification or specifications of tax capacity including tax rate indicators

Country income class and capacity estimation speciation	Standard deviation of country TE or RE	Country income class and capacity estimation speciation	Standard deviation of country TE or RE
LIC TE basic	0.12	LIC TE rates	0.07
LIC RE basic	0.13	LIC RE rates	0.07
LMIC TE basic	0.11	LMIC TE rates	0.07
LMIC RE basic	0.12	LMIC RE rates	0.07
UMIC TE basic	0.08	UMIC TE rates	0.05
UMIC RE basic	0.08	UMIC RE rates	0.05
LIC&MIC TE basic	0.13	LIC&MIC TE rates	0.06
LIC&MIC RE basic	0.13	LIC&MIC RE rates	0.07

Table A 5.3: Average Tax Effort (TE) and Domestic Revenue Effort (RE) for LICs and MICs that are resource dependent countries (RG2) using basic capacity estimates over sample period listed by declining non-tax revenues as shares of GDP

Country	TE basic	Std. Dev	RE basic	Std. Dev	RE basic-TE basic	Non-tax revenue as share of GDP (%)
Congo, Rep.	0.63	0.16	1.40	0.26	0.77	22.9
Algeria	0.77	0.17	1.33	0.14	0.56	22.4
Equatorial Guinea	1.08		2.15		1.07	18.3
Yemen	0.50	0.10	1.01	0.40	0.52	17.4
Iran	0.47	0.11	0.88	0.23	0.41	15.5
Nigeria	0.66	0.16	1.22	0.33	0.55	15.1
Russia	1.16	0.24	1.28	0.28	0.12	11.3
Botswana	1.82	0.36	1.83	0.26	0.01	11.0
Mauritania	0.93	0.13	1.15	0.18	0.22	8.2
Bulgaria	0.94	0.14	1.00	0.18	0.06	7.0
Colombia	0.85	0.13	1.00	0.14	0.15	6.9
Egypt	0.83	0.11	0.83	0.13	0.00	6.7
Trinidad and Tobago	1.18	0.12	0.97	0.08	-0.22	5.6
Cameroon	0.73	0.11	0.80	0.14	0.07	5.5
Chile	0.93	0.07	0.90	0.06	-0.03	5.3
Sudan	0.47	0.06	0.70	0.28	0.23	5.2
Tunisia	1.34	0.06	1.09	0.07	-0.26	4.5
Morocco	1.30	0.11	1.01	0.08	-0.29	3.9
Mongolia	1.28	0.16	1.24	0.13	-0.04	3.9
Angola	1.86	0.46	1.61	0.32	-0.25	3.8
China	1.29	0.10	1.12	0.06	-0.17	3.5
Suriname	0.91	0.22	0.97	0.20	0.05	3.4

Namibia	1.57	0.11	1.36	0.08	-0.21	3.1
Papua New Guinea	1.77	0.19	1.73	0.15	-0.04	3.1
Togo	1.00	0.18	0.93	0.18	-0.07	2.9
Bolivia	1.19	0.22	1.14	0.21	-0.05	2.7
Romania	0.87	0.09	0.83	0.09	-0.04	2.5
Indonesia	0.81	0.12	0.80	0.06	-0.01	2.1
Chad	0.63	0.37	0.64	0.40	0.01	1.8
Kazakhstan	0.79	0.18	0.74	0.14	-0.05	1.7
Mexico	0.79	0.06	0.72	0.07	-0.07	1.6
Ghana	0.81	0.12	0.73	0.12	-0.07	1.3
Niger	0.75	0.21	0.67	0.18	-0.08	1.2
Georgia	0.67	0.23	0.67	0.21	0.00	1.2
Guinea	0.89	0.11	0.78	0.10	-0.11	1.1
Congo, Dem. Rep.	0.32	0.22	0.32	0.23	0.00	1.0
Sierra Leone	0.75	0.06	0.66	0.05	-0.09	0.4

Annex 6: Illustration of revenue gaps

Two hypothetical typical countries, one LIC and one HIC, are used here to illustrate the relative size of these different tax gaps for a VAT using the destination principle and credit-method. First, based on the structure of the VAT and the economy from national accounts, industry surveys, consumer or household surveys, and input-output tables, estimates have to be made of the potential effective tax base expressed as a share of GDP. Table A 6.1 illustrates the estimation of the VAT base using the consumption method.⁶⁶ The estimation of the potential tax base of a consumption VAT starts with final private consumption plus government purchases of goods, services and capital items. This is reduced by the government purchases that are VAT exempt (such as aid-funded purchases) and private final sales that are exempted (such as supplies by small businesses and possibly the agricultural, public education and health sectors.) The base is expanded by estimates of the taxable goods and services and capital items purchased by tax exempt businesses, which could include the financial sector, small businesses, health and education institutions, VAT-exempt non-governmental organizations, etc. that are identified in the VAT law. In Table A6.1, the estimated potential tax bases are 85% for the LIC and 75% for the HIC.

Table A 6.1: Estimates of the potential VAT base as share of GDP (%) using the consumption method

Country example		LIC	HIC
Components of tax base			
	Total private consumption	80%	65%
<i>plus</i>	Government purchases of goods and services, including capital items	17%	15%
<i>plus</i>	Private housing construction	3%	4%
<i>plus</i>	Taxable purchases by exempt business	10%	10%
	Sub-total	110%	94%
<i>minus</i>	Tax exempt government purchases	5%	1%
<i>minus</i>	Tax exempt final private sales	20%	18%
	Potential VAT base	85%	75%

Source: Authors calculations

The next challenge is to check how much of the potential base is effectively used or can be explained by the various gaps identified. Three components of the potential tax base are identified in Table A6.2, namely, (i) the effective base that is taxed, (ii) the tax and effective tax base forgone through tax expenditures (Gap 3), and (iii) the tax and related tax base that is lost through administrative and compliance inefficiencies (Gaps 4-7).⁶⁷ The effective tax base is estimated by dividing the actual VAT collections by the effective tax rate. In the examples, the LIC has a standard tax rate of 15%, but some 30% of the taxable supplies are taxed at a low tax rate set at 50% of the standard rate. This gives an effective tax rate of 12.75%. The actual VAT collections are 5% of GDP (which is an above average VAT

⁶⁶Glenday, G., Shukla, G.P. and Sugana, R., *Tax Analysis and Revenue Forecasting: Issues and Techniques*, teaching manual, Duke Center for International Development, 2011 version, Chapter 7.

⁶⁷ As noted above, net arrears in Gaps 4 and 5 can be negative if the government is delaying or under refunding tax credits or refunds owed to the taxpayer. This situation arises in some VAT systems.

collection rate for a LIC). This implies an effective tax base of only 39% (or 5%/12.75%) of GDP out of the potential base of 85% of GDP. It is common to observe many LICs and LMICs with effective tax bases in the range from 30% to 45% of GDP. One implication of the relatively small effective tax base is that the VAT does not yield large increases to rate increases. For example, a one-percentage point increase in the standard and lower rates for the LIC will yield less than 0.4% of GDP in added revenues. Alternatively, to achieve an added 1% of GDP in revenues through tax rate increases would require the standard VAT to be increased to at least 18% given the expected base contraction that would accompany price increases the loss of direct taxes as indirect taxes squeeze the direct tax bases.

Table A 6.2: Gaps between potential and actual tax for VAT expressed as gaps in tax base expressed as shares of GDP (%)

Country example	LIC	HIC
Components of and gaps in effective tax base		
(a) Potential VAT base	85%	75%
Standard tax rate	15%	20%
Low tax rate	7.5%	10%
Share of effective tax base at low rate	30%	30%
Effective tax rate	12.75%	17.00%
Tax collection	5%	9%
(b) Effective tax base	39%	53%
(c) Tax base loss ((a) - (b))	46%	22%
Tax expenditure (tax loss)	1.25%	1.8%
(d) Effective base loss	9.8%	10.6%
Administrative and compliance inefficiency (% of collections)	30%	15%
Effective tax loss	1.5%	1.4%
(e) Effective base loss	11.8%	7.9%
(f) Unexplained tax base loss ((c)-(d)-(e))	24.2%	3.5%

Source: Authors calculations

In the case of the HIC with a 20% standard tax rate that yields 9% in revenues, the effective base is 53% out of a potential base of 75%. In the case of the LIC the tax base loss is 46% out of the potential 85% (or over half the potential is lost), while for the HIC, the loss in tax base is 22% out of 75% (or less than a third.) How much of these losses in tax base can be explained? The first major source is tax expenditures such as the use of zero rating for targeted final consumer goods and services. In Table A 6.2, tax expenditures of 1.25% for the LIC and 1.8% for the HIC result in losses of effective tax base of 9.8% and 10.8%, respectively. The tax expenditure could be higher if some of the supplies taxed at the low rate are not justifiable on income distributional grounds. For example if half the items at low tax rates were classified as tax expenditures, the added tax loss would be some 0.44% or a loss in effective tax base of 3.2%. In the case of the HIC, the tax expenditure of 1.8% explains a loss in effective tax base of 10.6% of GDP.

The next tax loss accounted for are those arising from tax policy-driven tax expenditures. Section 8 deals tax expenditures in some depth in and for all tax types. In the case of a VAT, they typically arise from zero rating targeted domestic supplies such as medicines and other medical products, inputs into education and agriculture, etc. In the typical cases presented here, they explain 9.8% of the 46% of the tax base loss of the LIC and 10% of the 22% of tax base loss in the case of the HIC.

The final accounting of the tax base loss comes from inefficiencies in tax administration and compliances that can be broken down into a set of tax gaps (4 through 7) as discussed above. Estimating these tax gaps requires both the internal assessment of administrative operations to assess the efficiency of routine desk assessments and external audits and the accounting of delayed payments, debt collections and refund payments. The compliance issue of failure to file by registered taxpayers requires the gathering of external audit information on the possible tax losses, but the compliance issue of failure to register (Gap 7) is more challenging. This requires reliable external information on the existence and economic activity of such unregistered taxpayers who are likely to be operating in the informal sector of an economy which in most LICs and LMICs are typically large and poorly documented in national statistical surveys of labor force and industrial sectors. The estimates of administrative and compliance efficiency typically capture the known administrative data concerning Gaps 4, 5 and 6. In Table A 6.2, the HIC is losing 15% of its VAT revenues through inefficient tax administration and compliance, which explains a further 7.9% of GDP out of its 22% of base loss and only leaves a small amount of 3.5% of GDP unexplained. By contrast, while the LIC is losing 30% of its VAT revenues through inefficient tax administration and compliance, which accounts for 11.8% of its 46% of GDP in base loss, this leaves a large amount of 24.2% of GDP of base loss unexplained. Note that even if the administrative and compliance inefficiency were found to be double at 60%, the unexplained base loss would still be 12.5% of GDP.

This combined outcome for LICs and LMICs of low effective tax bases and difficulty in explaining the tax gaps arises out of the joint difficulties faced by tax administrations and national statisticians. Both have difficulty in identifying the members of and the types and values of economic activities in the informal or non-observed sectors. Even if GDP estimates are reasonably accurate, knowledge of the detailed composition of the economy may be considerably less so. This places challenges on both the estimates of the potential tax bases and the sources of the tax gaps, both of which rely on the detailed sector and household information to allocate the tax base to the economic structure. Typically, this information is more incomplete and less accurate in the case of LICs and LMICs so that the errors are expected to be higher. The major source of problems arises in the unincorporated business activities in most countries. In HICs, such businesses may well be largely identified in both national statistics and tax registration (except for some underground shadow economy activities). Nevertheless, HIC tax administrations have difficulty with assessing the business activities of self-employed persons who typically can underreport income or sales and overstate costs where transactions lack reporting by a formal third party such as a bank, corporation or government and are poorly or undocumented by the business. For LICs, the same assessment problems exist with such businesses that are actually identified by the tax administration, but the scope of the problem is much larger. A key problem area is in Gap 7 where a LIC has large numbers of business activities in rural and urban informal sectors that are difficult to identify and measure by both the national statistician and the tax administrator. Much of the unexplained tax base loss for the LIC in Table A 6.2 is likely to be accounted for by unidentified (and difficult to identify) informal businesses including those in the non-monetary sector. While the estimation of tax losses from tax expenditures and administrative and compliance inefficiencies is clearly important, these factors are insufficient in fully explaining the tax performance of lower income countries. An added approach is to estimate the tax capacity and tax effort of a country. The next subsection discusses this.