



USAID
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COLLECTING TAXES 2017/2018 PROGRAM DOCUMENT

A guide to understanding and using the USAID Collecting Taxes Database



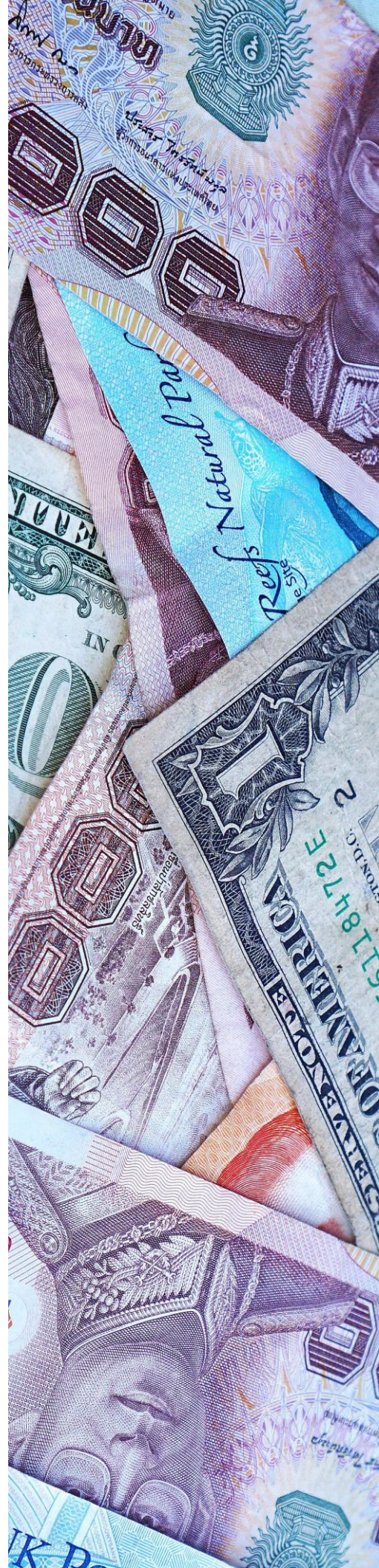
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ACRONYMS

ADB	Asian Development Bank
CIT	Corporate Income Tax
CTD	Collecting Taxes Database
EAP	East Asia and Pacific
ECA	Europe and Central Asia
EU	European Union
E3	Bureau for Economic Growth, Education and Environment
GDP	Gross Domestic Product
HDI	Human Development Index
ICRG	International Country Risk Guide (of the PRS Group)
ICT	Information and Communications Technology
IMF	International Monetary Fund
LAC	Latin America and Caribbean
LIC	Low income country
LTU	Large Taxpayer Unit
LPFM	Leadership in Public Financial Management
MENA	Middle East and North Africa
OECD	Organisation for Economic Co-operation and Development
PIT	Personal Income Tax
SAR	South Asia
SSA	Sub-Saharan Africa
LMIC	Lower middle income country
TADAT	Tax Administration Diagnostic Assessment Tool
UMIC	Upper middle income country
USAID	United States Agency for International Development
VAT	Value Added Tax
WB	World Bank
WDI	World Bank Development Indicators
WEO	World Economic Outlook (of the IMF)



PREFACE

This guide was prepared by a team at Nathan Associates, Inc., comprised of Timothy Robinson, Janine Mans, and Nicole Gunkle, and was reviewed by Victoria Waite. Its preparation benefited from the overall guidance of Steve Rozner, Anton Kamenov, and Theresa Stattel of the U.S. Agency for International Development (USAID), and the contributions from Stephanie Sweet and Tess Perselay on the 2015/16 Collecting Taxes Database Program Document. The document was prepared under the Leadership in Public Financial Management II (LPFM II) Project, a USAID-funded activity that provides short and long-term expertise on a range of public financial management and economic policy issues to USAID operating units worldwide.

Citations to the dataset and original sources should be made, where applicable. Please cite the work as follows: U.S. Agency for International Development. 2017/18 Collecting Taxes Database. July 2018. <https://www.usaid.gov/what-we-do/economic-growth-and-trade/domestic-resource-mobilization>.

For further information, please contact Steve Rozner (srozner@usaid.gov) or Anton Kamenov (akamenov@usaid.gov). USAID also requests users to kindly email copies of any publications, papers, or reports that employ the Collecting Taxes Database (CTD) data to Steve Rozner at srozner@usaid.gov.



OVERVIEW

USAID's Collecting Taxes Database (CTD) is a compilation of internationally comparable statistics about taxation designed to provide policymakers, practitioners, and researchers with the means to conduct cross-country analysis on domestic revenue mobilization (DRM). It is part of a wider agenda of the international community to help countries strengthen their tax systems and mobilize domestic revenue. The dataset includes comparative information on a range of tax performance and tax administration variables for close to 200 countries and territories. It complements a number of other publicly available revenue datasets that present cross-country statistics on revenue collection as well as structural features of national tax systems.¹

The CTD's added value is twofold: it is the only publicly available database that provides worldwide indicators relating to tax administration for developing countries;² and, it is the only dataset that provides alternative measures to tax performance on a global scale.³ The breadth of the CTD data thus enables users to examine the structure and performance of tax systems in an internationally comparative context.

This document first presents a brief overview of the dataset. Next, it describes how users can access and use the database. Lastly, it provides a presentation of the indicators with region, income group, and topical highlights. It also provides illustrative examples of correlations and regressions.



¹ Some other publicly available datasets include International Monetary Fund's (IMF) World Revenue Longitudinal Dataset (WoRLD), International Centre for Tax and Development's Government Revenue Dataset (ICTD GRD), KPMG's Tax Rates Online, and Deloitte International's Tax Source (DITS), among others. Other datasets that are available by request include IMF's Revenue Administration Fiscal Information Tool (RA-FIT) and IMF's Gap Analysis Program (RA-GAP). In addition, there is the Tax Administration Diagnostic Assessment Tool (TADAT), although this is an assessment methodology more than a compiled dataset. TADAT assessments have been completed in more than 30 countries but only 12 are publicly available.

² The OECD Tax Administration Database is the only other database with comparative information on tax administration characteristics; however, it is only available for 52 advanced and emerging economies (including all OECD, EU, and G20 members). The Asian Development (ADB) also produced assessments on tax administration variables for the Asia region in 2014 and 2016. See Araki, S., & Claus, I. (2014) and Miyaki, Y. & Highfield, R. (2016). A comparative analysis of tax administration in Asia and the Pacific. Mandaluyong City, Philippines: Asian Development Bank

³ Some of the policy indicators are available, for one country or small groups of countries, in various policy papers and reports.

THE DATASET

COVERAGE

The CTD is a compilation of cross-country comparable data on taxation. The 2017/18 edition contains 20 indicators for roughly 200 economies spanning all regions and income groups. It is organized around two themes: Tax Administration and Tax Performance. The *Administration* dataset includes eleven cross-sectional indicators that describe or measure the main features of the government bodies responsible for collecting tax

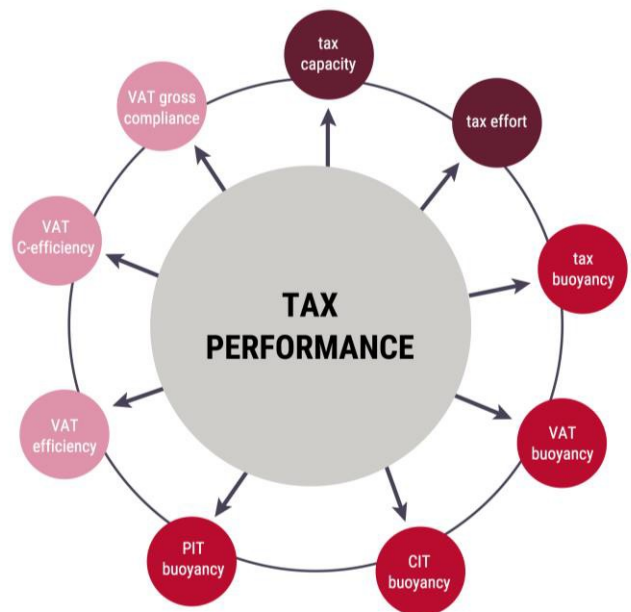
revenue. Entries in this dataset are for the years 2015 and 2017. The *Performance* dataset includes nine time-series indicators on measures such as efficiency, buoyancy, and effort for major taxes between 2000 and 2017. See Annex I for more detailed data coverage. Major taxes include Value Added Tax (VAT), Corporate Income Tax (CIT), and Personal Income Tax (PIT).

Category	Number of indicators	Type of Data
Tax performance	9 indicators	Time series for 2000-2017
Tax administration	11 indicators	Data for the years 2015 and 2017

SCOPE

The *Administration* indicators are organized in three clusters: Institutional Characteristics (function, large taxpayer unit, autonomy, customs), Resource Efficiency (ratios of cost to collection, population to staff, labor force to staff, taxpayer to staff), and use of electronic services (e-registration, e-filing and e-payment).

The *Performance* indicators are organized in three clusters: Collection (tax effort, tax capacity), Buoyancies (Tax Buoyancy, VAT Buoyancy, CIT Buoyancy, PIT Buoyancy), and Productivity (VAT Efficiency, VAT C-Efficiency, VAT Gross Compliance).⁴



⁴ Tax capacity is in the context for performance, but is not a measurement of performance per se. The reasons for not constructing efficiency indicators for PIT and CIT is described in the Methodology Note.

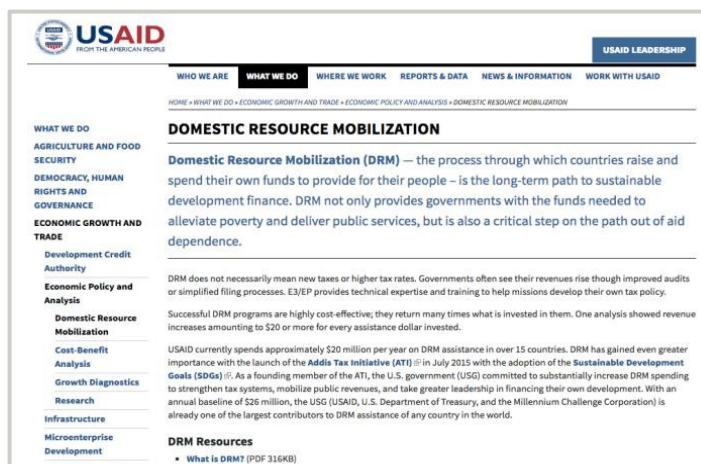
USER'S GUIDE TO THE DATABASE

ACCESS TO THE DATABASE

To access the CTD tables, visit the USAID DRM website [here](#). The most recent version of the CTD, released in August 2018, is open and free for anyone to copy, distribute, and adapt. The primary data file is available for download in Microsoft Excel (.xlsx).

A companion product, the *CTD Data Visualization Tool*, allows users to query and display data in various tabular and graphic formats. The *Methodology Note* provides users with the methodology, sources, and data limitations as well as country-specific notes.

CTD will be updated periodically based on updates to the underlying data as well as feedback from users. Users are encouraged to contact USAID's Bureau for



Economic Growth, Education, and Environment (E3) with feedback and suggestions on how to improve the dataset.

[Home](#) » [What We Do](#) » [Economic Growth and Trade](#) » [Economic Policy and Analysis](#) » [Domestic Resource Mobilization](#)

THE DATASETS

The *Administration* data file includes two years of observations – 2015 and 2017⁵ – with variables expressed as a percent, number, or dummy (1 or 0).⁶ The *Performance* data file is a time-series dataset covering the period 2000 through 2017, with variables expressed as a percent of GDP or percent change. The roughly 200 economies presented in the file are listed alphabetically. The term country is used interchangeably with economy, and refers to any territory for which economic and tax statistics are available.

The country codes, regions, and income groups included in the CTD allow for easy merging with other major sources of data such as the International Monetary Fund (IMF) WoRLD or World Bank World Development Indicators. CTD employs the country codes, region and income group categorizations

Country	code	region	inc	year	cost	payer	pop	labor	function	itu	customs	autonomy	e_file	e_pay
Albania	ALB	ECA	UM	2015		73	1,822	815	1	1	0	0	1	0
Algeria	DZA	MENA	UM	2015					1	1	0	0	0	0
Andorra	ADO	ECA	H	2015	0.60				1	n/d	0	0	1	1
Angola	AGO	SSA	UM	2015					1	1	1	1	1	1
Antigua and Barbuda	ATG	LAC	H	2015					n/d	0	0	0	n/d	n/d
Argentina	ARG	LAC	UM	2015	1.99		2,569	1,156	1	1	1	1	1	1
Armenia	ARM	ECA	UM	2015					n/d	1	1	1	1	1
Aruba	ABW	LAC	H	2015					n/d	n/d	0	0	1	1
Australia	AUS	EAP	H	2015	0.93		1,119	584	1	1	0	1	1	1
Austria	AUT	ECA	H	2015	0.65	206	1,013	525	1	1	1	0	1	1
Azerbaijan	AZE	ECA	UM	2015					1	1	1	1	1	1
Bahamas	BHS	LAC	H	2015					n/d	n/d	0	0	1	1
Bahrain	BHR	MENA	H	2015					0	0	0	0	0	0
Bangladesh	BGD	SAR	UM	2015		101	13,608	6,675	0	1	1	1	1	1
Barbados	BRB	LAC	H	2015			1,672	955	n/d	n/d	0	1	1	n/d
Belarus	BLR	ECA	UM	2015					0	1	0	1	0	0
Belgium	BEL	ECA	H	2015	1.16		577	254	1	1	0	0	1	1
Belize	BLZ	LAC	UM	2015					0	0	0	0	0	0
Benin	BEN	SSA	L	2015	0.47				0	1	0	0	0	0
Bermuda	BMU	NA	H	2015					1	0	0	0	1	1
Bhutan	BTN	SAR	UM	2015		853	1,331	694	0	0	1	0	1	1
Bolivia	BOL	LAC	UM	2015					1	1	0	1	1	1
Bosnia and Herzegovina	BH	ECA	UM	2015					n/d	n/a	0	0	1	0
Botswana	BWA	SSA	UM	2015					1	1	0	1	1	1
Brazil	BRA	LAC	UM	2015	0.69		8,441	4,461	0	1	1	0	1	1
Brunei Darussalam	BRN	EAP	H	2015			14,106	6,777	1	0	0	0	1	1
Bulgaria	BGR	ECA	UM	2015	1.25		936	433	1	1	0	1	1	1
Burkina Faso	BFA	SSA	L	2015					0	1	0	0	0	0
Burundi	BDI	SSA	L	2015					0	n/d	1	1	0	0
Cambodia	KHM	EAP	UM	2015			6,231	3,450	1	1	0	0	1	1
Cameroon	CMR	SSA	UM	2015		4	6,375	2,506	1	1	0	0	1	1
Canada	CAN	NA	H	2015	1.08	684	939	517	1	1	0	1	1	1
Cape Verde	CPV	SSA	L	2015	1.96				1	1	1	0	1	1
Central Africa	CAF	SSA	L	2015					n/d	n/d	0	n/d	n/d	n/d
Chad	TCD	SSA	L	2015					1	1	0	0	0	0
Chile	CHL	LAC	H	2015	0.50		4,378	2,085	1	1	0	1	1	1
China	CHN	EAP	UM	2015		45	1,816	1,068	0	1	0	0	1	1
Colombia	COL	LAC	UM	2015	0.56	460	9,197	4,632	1	1	1	1	1	1

employed by the World Bank.⁷ Aggregate measures for income groups and region groups appear at the end of each dataset.

⁵ The 2017/18 CTD does not include historic data prior to 2015 for tax administration indicators, and any comparisons to previous datasets should be made with caution due to changes in methodology

⁶ In cases where 2015 data were not found, historical data were used for some variables. Such exceptions are noted in the Country Notes.

⁷ The full country categorization can be found here: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>. Please note that these may differ from other common geographic usage. Because GNI per capita changes over time, income group classifications change over time

DATA PRESENTATION

- A blank means not determinable or not applicable.
- A blank for an aggregate (for regions and income groups) means not analytically meaningful. Group composites are calculated when 70 percent or more of the countries included have data available. Figures in red italics are composites where more than 70 percent but less than 90 percent of countries have data available, and should be used with caution.
- 0 or 0.0 means zero or small enough that the number would round to zero.
- Data refer to calendar years, except in cases where countries use fiscal years. (This is noted in the Methodology Note).
- Country and aggregate data for *Performance* are provided in percentages or percent changes. *Administration* country data are provided in whole numbers, percentages, or dummy (1 or 0). *Administration* aggregates are displayed as count frequencies.
- The cutoff date for *Administration* data is March 1, 2018 and May 1, 2018 for *Performance* data.

HISTORY OF THE CTD

The first edition of Collecting Taxes was launched in 2008. From its inception until 2013, the annually updated CTD dataset featured more than 30 tax and tax-related variables and represented the only publicly accessible dataset of its kind.

With the rise of other databases and increased work on tax analysis in recent years, the dataset underwent an overhaul between 2014 and 2015, with refinements and improvements made to the indicators, methodology, sources, and data. The team reviewed and considered more than 40 relevant indicators from the literature and also consulted tax experts from the IMF, World Bank, and government to determine robustness as well as perceived popularity of usage, resulting in a total of 20 indicators today. The construction of the 2017/18 CTD was based on the careful compilation of data from multiple existing data sources, in order to arrive at a complete and comprehensive dataset.



USING THE DATASETS

Kenya is used below as an example to demonstrate the information available within each of the CTD datasets.

In the *Administration* dataset, users can view 11 indicators to understand the facets of the Kenyan tax administration system. As previously noted, this dataset includes only two years of data.

In 2017/18, the budget for the Kenya Revenue Authority was 21.74 billion Ksh and it collected 1.07 trillion Ksh in revenue. This translates to a **cost of collection** of 2.03 percent (i.e. it costs 2.03 Ksh to collect every 100 Ksh). Underlying data are not provided in the dataset and are only provided here for illustrative purposes.

country	region	inc	year	cost	payertostaff	poptostaff	labortostaff	function	ltu	customs	autonomy	e_reg	e_file	e_pay
Kenya	SSA	LMIC	2015	2.03	346	9,948	3,781	I	I	I	I	n/d	I	I
Kenya	SSA	LMIC	2017	2.03	345.65	10,469.12	4,161.10	I	I	I	I	I	I	I

Kenya has a **tax buoyancy** of about 1.20 on average between 2014 and 2017. This means that for every one percentage point increase in GDP, Kenya generated only 1.2 percentage points more in tax revenue each year. Its CIT and PIT buoyancies are quite high, while its VAT buoyancy is substantially lower.

In the *Performance* dataset, users can access nine indicators and view Kenya's performance over time on aspects of collection, efficiency, and other measures of performance. Data cover the period 2000 to 2017, although the excerpt below displays only four years of data for illustrative purposes.

country	code	year	code_yr	region	income	tax_capacity	tax_effort	tax_buoy	vat_buoy	cit_buoy	pit_buoy	vat_eff	vat_c_eff	vat_gcr
Kenya	KEN	2014	KEN2014	SSA	LMIC	34.18	0.49	1.18	0.77	1.66	1.76	26.91	28.69	33.68
Kenya	KEN	2015	KEN2015	SSA	LMIC	33.38	N/d	1.21	0.82	1.69	1.74	25.92	27.75	32.77
Kenya	KEN	2016	KEN2016	SSA	LMIC	33.52	N/d	1.19	0.74	1.75	1.72	N/d	N/d	N/d
Kenya	KEN	2017	KEN2017	SSA	LMIC	N/d	N/d	1.20	0.71	1.64	1.65	N/d	N/d	N/d

In both datasets, the user can manipulate the information to compare Kenya to Sub-Saharan Africa (SSA) and other lower middle income countries (LMICs). Below is an excerpt from the *Administration* dataset. As previously noted, the blanks are not analytically meaningful, and the red italics remind the user that data were available for more than 70 percent but less than 90 percent of the countries in that group.

Users can see that Kenya, like most of SSA and LMICs, has a function-based tax administration and large taxpayer unit. Kenya is also similar to more than a third of its regional and income group comparator countries in that its revenue authority integrates customs and domestic tax, it is fully or semi-autonomous, and it makes electronic registration, filing and payment available to taxpayers.

country	region	inc	year	cost	payertostaff	poptostaff	labortostaff	function	ltu	customs	autonomy	e_reg	e_file	e_pay
Kenya	SSA	LMIC	2017	2.03	345.65	10,469.12	4,161.10	I	I	I	I	I	I	I
SSA	SSA		2017	<i>2.26</i>	<i>202.77</i>	<i>8,121.40</i>	<i>3,376.38</i>	33	39	25	23	13	22	22
LMIC		LMIC	2017	<i>2.32</i>	<i>541.13</i>	<i>7,341.51</i>	<i>3,063.68</i>	38	40	20	18	18	35	34

INDICATORS: ADMINISTRATION

A robust and sustainable tax system requires a good and efficient tax administration. This section compares the administrative frameworks, functions, and performance of revenue authorities in 202 countries. These indicators measure the business environment, the roles and powers of a revenue authority, information and communication technology (ICT), and the efficiency and performance of revenue authorities with regard to human resources (HR) and finances.

Information contained in the *Administration* dataset is derived from review of websites, reports, and organograms of the respective country's ministry of finance or revenue authority and from a variety of third-party resources, including IMF, WB, and Asian Development Bank (ADB reports).

This dataset includes 11 indicators divided into three clusters: (i) institutional characteristics, (ii) resource efficiency, and (iii) use of electronic services. The comparative analysis in the following sections offers some high-level observations on aspects of countries' tax systems and their administration.



The **institutional characteristics** indicators describe whether a revenue authority is organized on the basis of business function (Function), whether there is a dedicated large taxpayer unit (LTU), whether it operates as a single integrated revenue—customs and domestic tax—authority (Customs), and whether it has been granted a degree of autonomy to carry out its mandate (Autonomy). These four indicators are dummy variables that state whether a tax administration has a particular organizational feature or characteristic. They do not make a value judgment as to whether these features are desirable or not.

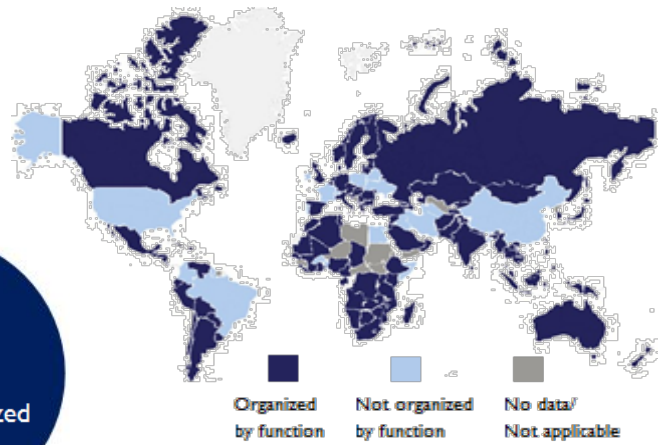
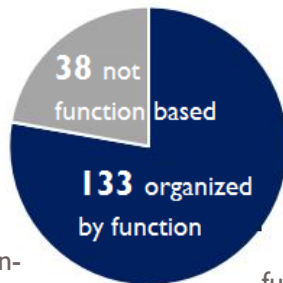
The **resource efficiency** indicators provide quantitative measures of a revenue authority's ability to carry out its mandate to collect tax revenue, given its financial and human resources. The first indicator looks at the cost of collecting taxes based on the revenue authority's budget. The other three indicators look at the adequacy of staffing in proportion to the size of the country's population, labor force, and the number of taxpayers, respectively.

Use of **electronic services** is another important aspect of modern tax administrations and is commonly seen as a means to lower both administrative and taxpayer compliance costs. Three indicators, e-registration, e-filing and e-payment, are included under this category and are presented as dummy variables, indicating whether a tax administration has the e-service or not.

INSTITUTIONAL

FUNCTION ORGANIZATION

A function-based tax administration is one organized on the basis of the business functions or type of work performed, such as registration, enforcement, audit, taxpayer services, arrears management, etc. This differs from a tax administration that is organized according to the taxes administered (e.g. VAT, income tax, etc.) or taxpayer segment (e.g. individuals, small companies, large companies).



Most tax administrations today are function-based, many of which also have elements of a taxpayer-segment structure (e.g. large taxpayer unit). According to CTD 2017/18, there are 133 countries with tax administrations that are organized by function, out of the 171 with data available. Among the regions, SSA has the highest frequencies of function-based tax administrations, with 33 out of 38. In East Asia and Pacific (EAP), Latin America and the Caribbean (LAC) and Europe and Central Asia (ECA), 78 percent of countries have national tax administrations that are

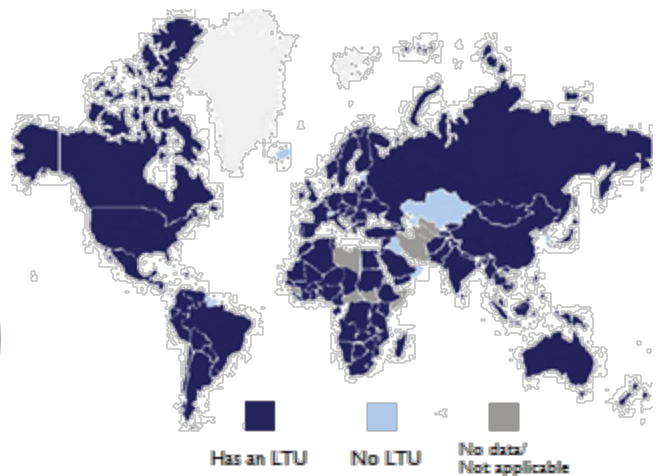
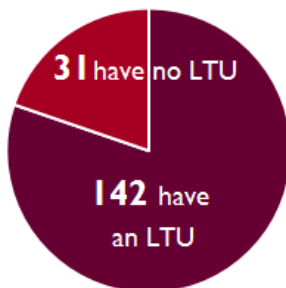
function-based. It is worth noting that the highest percentage of revenue authorities that are *not* organized by function (i.e. are organized by type of tax or taxpayer segment, but not on a functional basis) fall within the high-income category, and include, for example, the United States, France, and Singapore.

This is a dummy or binary variable describing the organization of a revenue (tax) authority. This indicator is "1" where the tax administration is organized by function and a "0" where the tax administration is organized otherwise.

INSTITUTIONAL

LARGE TAXPAYER UNIT

Many tax administrations have established an LTU, which is a department dedicated to collection, taxpayer services, audit, and other functions of large taxpayers. Dedicating resources to these taxpayers is important because the risks, requirements, and contributions to overall revenue are greater. In general, a small number of large taxpayers contribute the majority of tax revenues in most countries.



Additionally, these taxpayers are often subject to many taxes and tend to have characteristics different from small and medium-sized businesses, including international transactions, ICT-based accounting systems, and countrywide jurisdiction.

Managing these taxpayers can be more efficient when there is a single organizational point of contact with the tax administration.

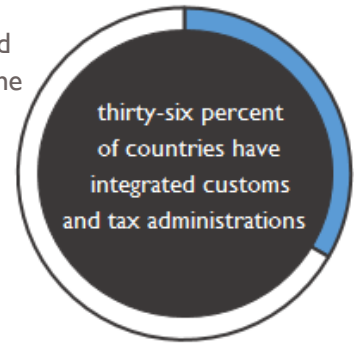
Today, there are 142 tax administrations with dedicated LTUs out of 173 countries with information available. Only 6 developing countries are without an LTU, while there are 17 high-income countries without one. The number of LTUs (including high-income) by region is as follows: EAP (16), EAC (41), LAC (26), North America (NAR) (2), Middle East and North Africa (MENA) (11), South Asia (7), and SSA (39). Data were unavailable for 29 countries.

This indicator is "1" where the tax administration has a large taxpayer unit and a "0" where the tax administration does not have a dedicated unit for large taxpayers.

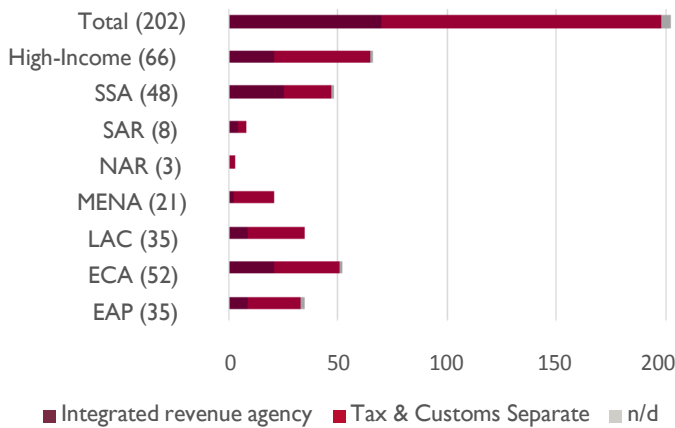
CUSTOMS

Many revenue bodies perform functions other than the collection of domestic taxes, including the collection of customs duties, VAT, and other taxes derived from traded goods. Some countries have elected to separate tax and customs services, while others fully integrate them under a single revenue authority. Reasons for having a single entity can include economies of scale, avoidance of duplicate functions, improved sharing of information, and cost effectiveness. Drawbacks to integration can

include fragmented accountabilities, misaligned risks and strategies, and the unique nature of customs operations (e.g. rules of origin, physical control over transactions, and real-time operations).



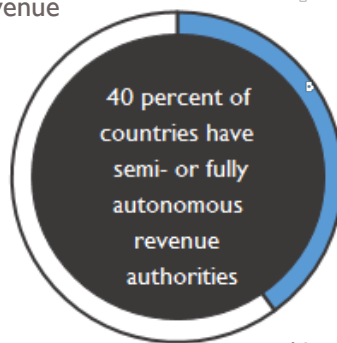
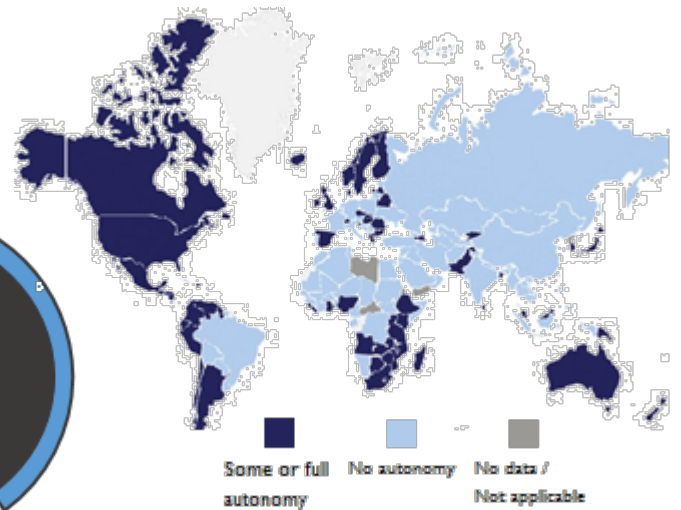
Globally, 36 percent of countries have integrated customs and tax administrations, including the Kenya Revenue Authority (est.1995), Rwanda Revenue Authority (1998), and the United Kingdom’s Her Majesty’s Revenue and Customs (2005). Low-income countries have the highest frequency (41 percent) of integration while only 32 percent of revenue authorities are integrated in high-income countries. Over 70 percent of countries in SAR have integrated revenue bodies, while almost half of revenue bodies in SSA have integrated customs and domestic tax administrations.



This is a dummy variable where a "1" indicates that both revenue (customs and tax) administrations operate as a single, integrated institution. A "0" indicates that they are separate. This indicator does not measure the degree of integration.

AUTONOMY

A revenue authority is considered semi-autonomous if it operates independently from government in terms of legal form, financial resources, HR, and/or administrative practices. Semi-autonomous revenue authorities have been delegated powers such as making tax rulings, hiring/dismissing staff, and designing the internal structure, etc., without requiring external approvals.



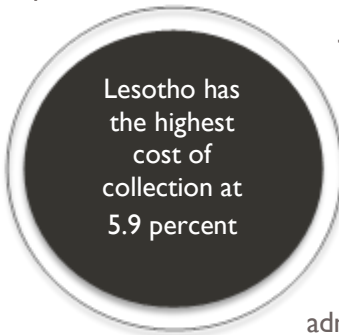
About 40 percent or 77 countries worldwide have a fully or semi-autonomous revenue authority. The trend is most prominent in NAR, SAR, and SSA countries, where 50 percent or more have separated tax administrations from the ministry of finance to grant them more autonomy. The outlier is the MENA region, where the tax administrations can still all be classified as a directorate or line department within the ministry of finance with limited or no autonomy.

Countries opt for increased tax administration autonomy for a variety of reasons. Whatever the reasons, strong and sustained coordination between the revenue body and the ministry of finance will be required if this is to be an effective policy choice.

This indicator is "1" for countries that have a full or semi-autonomous revenue authority and "0" for those countries in which the tax administration is subordinated to another government body (typically the finance ministry).

COST OF COLLECTION

This indicator measures how efficient revenue authorities are at using their financial resources to collect tax revenue. Revenue authorities, like any government agency, must decide how to optimally use the resources allocated to them to perform their responsibilities in the most efficient and effective way.



The cost of collection ratio compares the total annual tax administration expenditures (budget) with the net tax revenue collected by the tax administration.

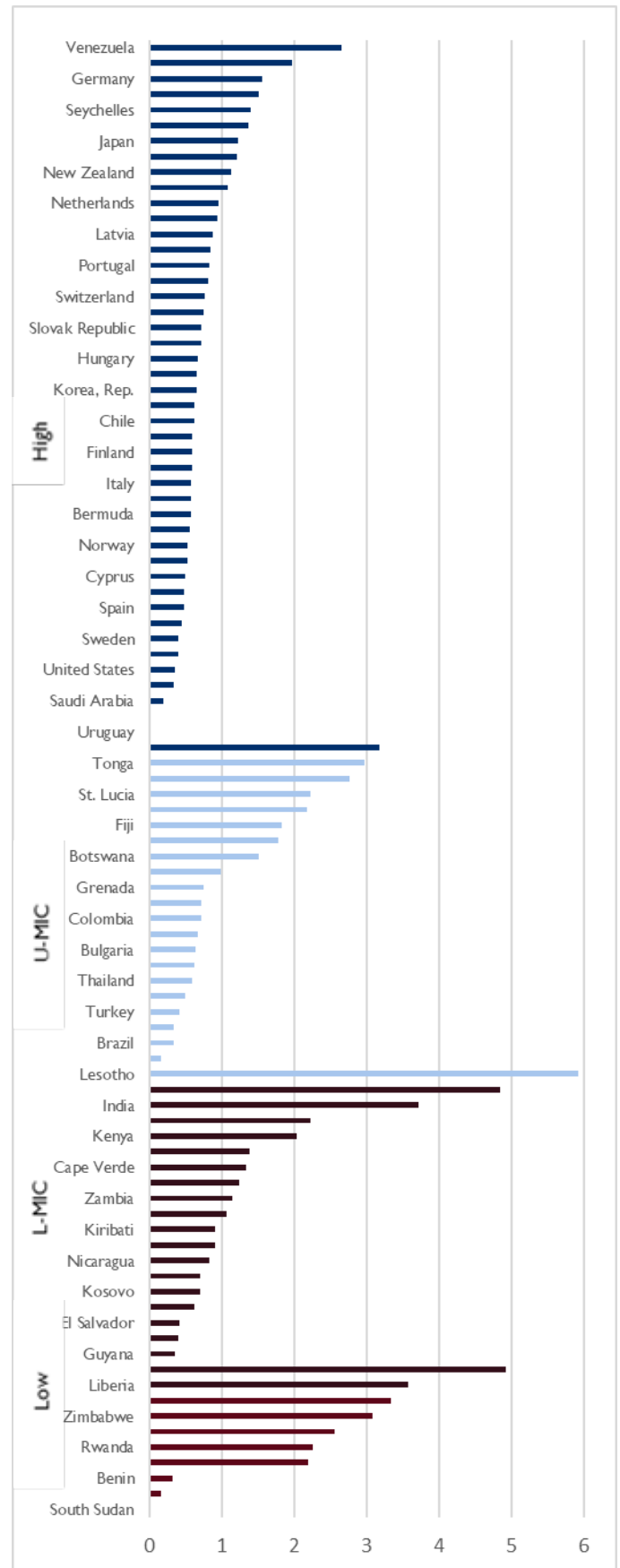
It is expressed as a percentage, or alternatively, as the cost of collecting 100 currency units of tax revenue.

CTD 2017/18 was able to obtain data for 96 countries, with costs of collection ranging from 5.9 percent (Lesotho) to 0.012 percent (South Sudan).⁸ In South Sudan, for example, the 2014/15 annual budget for the national tax administration was SSP 989,399 and in 2018, the Authority is projected to collect SSP 8 billion in total revenue, resulting in a cost of collection of 0.012 percent or 1.2 piasters per 100 SSP collected.



Other countries with high costs of collecting taxes (above 2.5 percent) include The Gambia and Swaziland. Other countries with low costs of collection (equal to or less than 0.4 percent) include Maldives, Azerbaijan, Guyana, and Estonia.

This indicator is the ratio of the cost of administering the tax system to the total revenues collected by the tax administration. It is expressed as a percentage or as the cost of collecting 100 currency units of tax revenue.



CTD collects and reports three ratios of efficiency and effectiveness of revenue authorities' staff usage.⁹ Staffing levels are policy and organizational choices and are influenced by a number of factors, including country size, economic structure, tax system design, and, of course, budgetary considerations. CTD 2017/18 finds that the size of tax administration and revenue authorities ranges dramatically from 20 staff members in Anguilla to 756,000 in China.¹⁰



POPULATION PER TAX ADMINISTRATION STAFF

This is a measure of the size of the country's population relative to the size of the tax administration workforce. If total population, for example, is 1,000,000 persons and the revenue authority has 2,000 employees, then the value of the ratio is 500, i.e., one tax staff member for every 500 persons in the country.

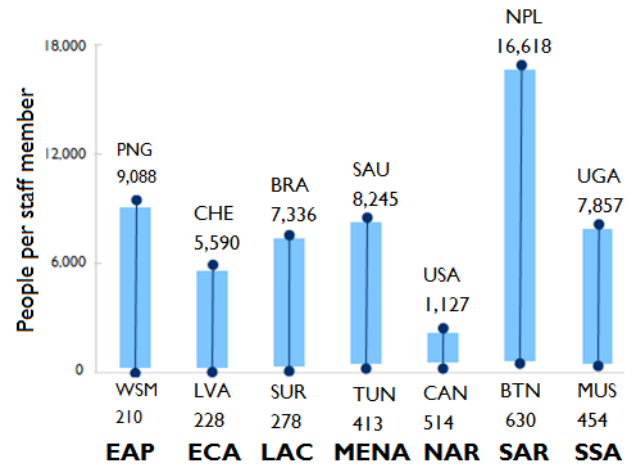
Staff numbers are highly correlated with population, with a correlation coefficient of 0.74.¹¹ Seychelles has the lowest ratio with 289 persons per tax administration staff, and Nepal has the highest with almost 29,305 persons in the country per tax staff.



LABOR FORCE PER TAX ADMINISTRATION STAFF

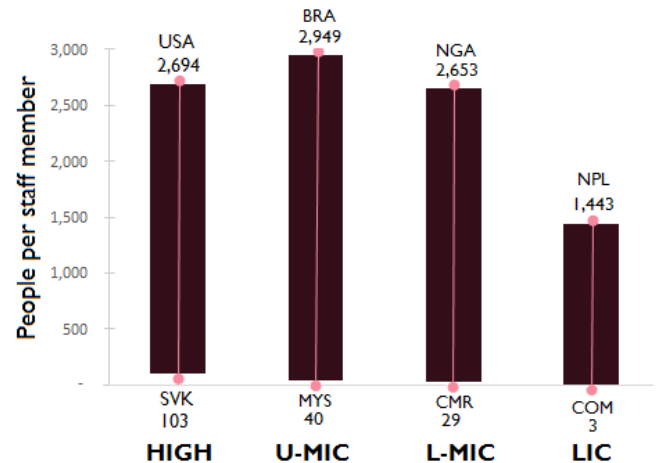
The second indicator compares the country's total labor force to the number of staff in the tax administration.

More than half of the countries for which there were data have labor force ratios less than 1,000. Several countries in Asia have high ratios, including Papua New Guinea, Myanmar and Cambodia. The ECA region has the lowest ratios.



TAXPAYERS PER TAX ADMINISTRATION STAFF

The third indicator in this group is the ratio of a country's total number of active taxpayers to the total number of staff in the tax administration. Comoros has only three taxpayers per staff member, respectively, while the United States, Mexico, and the Philippines have more than 2,000 taxpayers per staff.



These indicators measure (i) size of the country's population; (ii) total labor force; (iii) number of taxpayers in a country compared with the total number of staff of the tax administration.

⁹ Due to limited data, averages for regions and income groups were not calculated for the HR resource efficiency indicators. Instead, a scatterplot and two range charts are provided. There were only 87, 84, and 39 country observations for the population, labor force and taxpayer to staff ratios, respectively.

¹⁰ These differences largely reflect the differences in tax bases.
¹¹ The scatter diagram plots the total population against the number of staff members.

E-REGISTRATION AND E-FILING

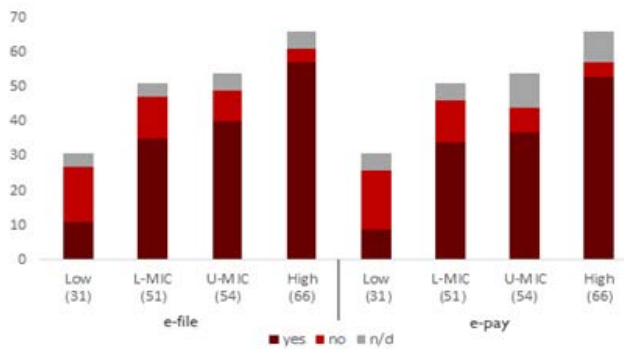
ICT can enable tax administrations to improve performance, reduce costs (administrative and compliance), and enhance information sharing. Among other improvements, electronic tax registration, filing, and payment can reduce the time and cost taxpayers dedicate to preparing and filing tax returns. It can reduce the need for taxpayers to visit tax offices, reduce errors as well as opportunities for collusion or abuse. At the same time, e-registration, e-filing and other e-services can reduce the time and labor the tax administration has to dedicate to processing paper-based tax returns, and can improve the quality and accuracy of data.

Of 160 countries for which information was available, e-registration exists in about 50 percent, with NAR and SAR countries at almost 100 percent.

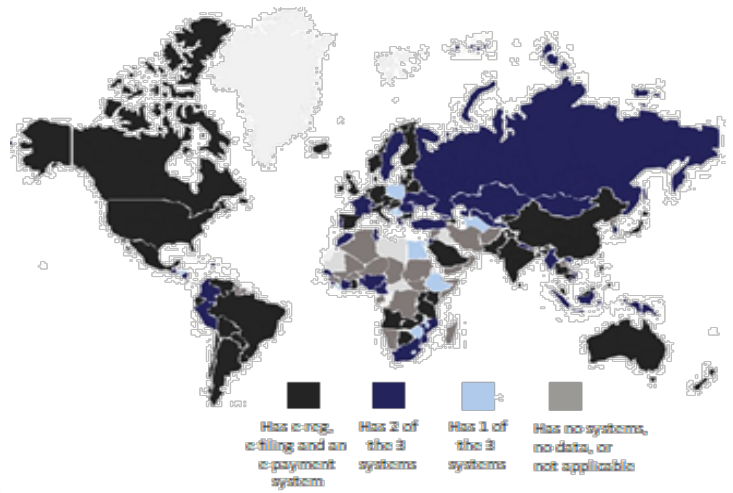


E-PAYMENT

There are a number of methods available for paying tax liabilities. The most basic, non-electronic means are cash payment at tax offices or checks by mail. Tax administrations have introduced electronic tax payment methods (e.g., online banking, direct debits) to



reduce the burden on the taxpayer. E-payment methods also decrease administrative costs, reduce the interaction between taxpayers and



E-filing is available in at least 143 countries out of 184 countries for which information was available. More than 90 percent of high-income countries have e-filing systems; however, only one-third of low-income countries do. Only about half of SSA countries have e-filing systems.

This indicator is a binary variable describing the availability of electronic filing in a country. E-filing is “1” if an electronic filing system is available for at least one core tax and all taxpayers, and “0” if not. Usage is not measured.

tax offices, and improve efficiency. The implementation and usage of electronic systems is often subject to infrastructure constraints and Internet access in the country.



Electronic payment methods are available in at least 133 countries. This functionality, like e-filing, is being rolled out in more and more countries as infrastructure and resources become available. More than 80 percent of high-income countries have electronic payment facilities available for taxpayers (businesses and individuals); however, only about 35 percent of low-income countries do. The highest prevalence of e-payment facilities is in NAR, followed by ECA and LAC, with the lowest in SSA. Data were unavailable for 29 countries worldwide.

This indicator is a binary variable describing the availability of e-payment for tax liabilities in a country. E-payment is “1” if an electronic payment system is available for at least one core tax and all taxpayers, and “0” if not.

INDICATORS: TAX PERFORMANCE

Measuring tax performance allows policy makers, analysts, and the public to understand the extent to which various types of taxes are effective in mobilizing revenue. This section highlights a number of indicators that can be used to compare how well various tax types perform relative to a country's potential and relative to other comparator countries within the 200-country dataset. These indicators measure potential and actual revenue mobilization, how various tax types respond to increases and decreases in GDP, and the efficiency of the VAT collection system.

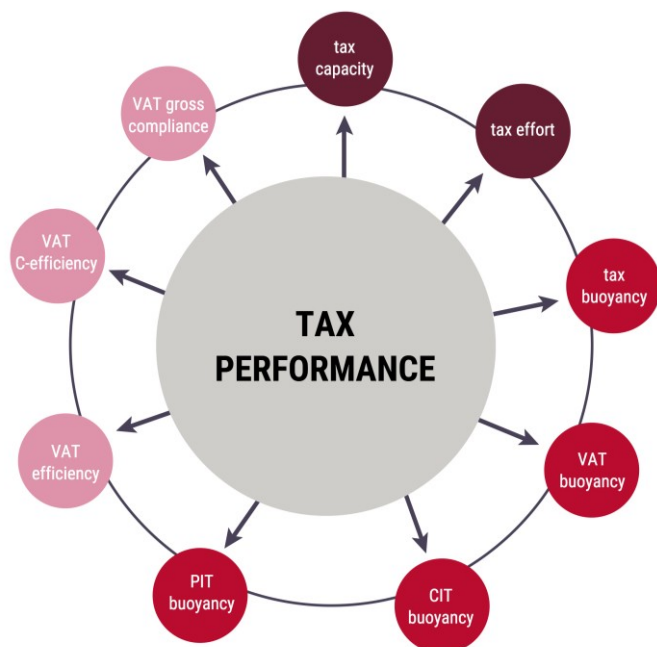
Information contained in the *Performance* dataset consists of calculated values based on data derived from global databases such as the IMF World Economic Outlook (WEO) database, the IMF World Revenue Longitudinal Dataset (WoRLD), the World Development Indicators (WDI), and the Worldwide Governance Indicators (WGI). Data on various tax rates were obtained through a review of data from the respective country's Ministry of Finance, from Organisation for Economic Co-operation and Development (OECD) reports, and from a variety of

This dataset comprises nine indicators divided into three clusters: (1) tax capacity and tax effort, (2) tax buoyancies, and (3) VAT productivity. The comparative analysis in the following sections provides insights on aspects of the performance of national tax systems overall and across the core taxes, i.e., VAT, CIT and PIT.

The two **tax capacity and tax effort** indicators estimate what a country could potentially collect in taxes given its specific macroeconomic, demographic, and institutional features, and the extent to which a country is able to reach that potential. These two indicators provide insights as to whether countries might have opportunities to increase tax revenues further, either through improvements in tax policy, tax administration or both.

The four **tax buoyancy** indicators allows us to understand how tax collection for various tax types (i.e. PIT, CIT, and VAT) respond to changes in the tax base, as measured by GDP. Examining these figures can provide insights on the extent to which different tax types are under-performing, and, when examined in conjunction with data on economic conditions, how tax collection is affected by episodes of economic growth and contraction.

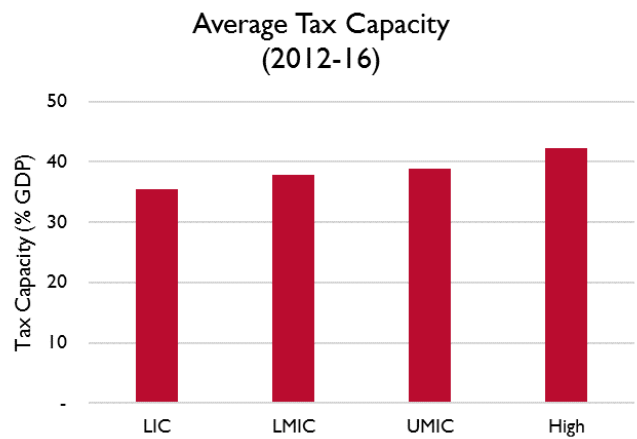
The three **VAT productivity** indicators assess the extent to which actual VAT collections approach the values that are predicted based on the VAT rate and levels of consumption in the economy. Analysis of these variables helps to identify countries for which VAT productivity may be very high or very low, and can show how VAT productivity changes over time, whether in response to changes in policy, administration or other factors.



TAX CAPACITY

TAX CAPACITY

Tax capacity is the estimated Tax/GDP ratio that a country could potentially achieve given its specific macroeconomic, demographic, and institutional features. More specifically, tax capacity predicts a country’s Tax/GDP ratio based on its per capita GDP, the contribution of agriculture to GDP, the size of its working-age population relative to the rest of the population, trade openness, and a measure of corruption drawn from the World Governance Indicators (WGI) dataset.



Tax capacity varies substantially across income groups. For example, the average tax capacity of low-income countries is 34.6, while tax capacity rises to 36.9 and 38.8 for lower middle and upper middle-income countries, respectively. For high-income countries, tax capacity averages about 42.5.

Tax capacity is a predicted value of tax as a percent of GDP taking into account several factors such as macroeconomic, demographic, and institutional characteristics of a country.

TAX EFFORT

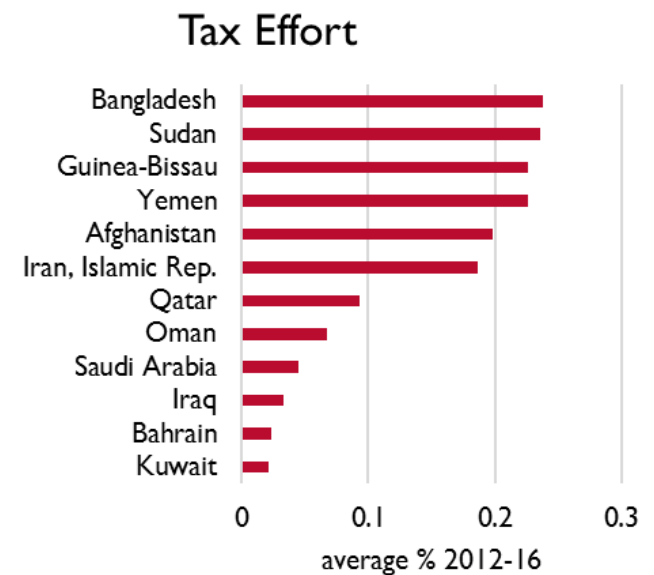
TAX EFFORT

Tax effort measures how much tax revenue a country collects relative to its tax capacity. A tax effort of 1.0 indicates that a country is at its full tax capacity. A tax effort below 1.0 indicates that a country is collecting less than its predicted capacity.

Overall, 42.9 percent of countries in the sample¹² have a tax effort at or above 0.5. No low-income country in the sample has a tax effort exceeding 0.5. About 25.5 percent of LMICs and 41.5 percent of UMICs have tax efforts over 0.5. About 53.8 percent of high-income countries fall in this category.

The region with the highest average tax effort is ECA at 0.60. The SAR region had the lowest average tax effort, at 0.32 followed closely by the MENA region at 0.35, taking the average for 2012-2016.

There are 12 countries with tax effort less than 0.25. Half of these countries are either low or lower middle-income countries, and the other half are upper middle-income or high-income countries. Low tax effort is



Tax effort compares the actual value of tax as a percent of GDP to tax capacity. A tax effort of 1.0 indicates that a country is collecting exactly its tax capacity.

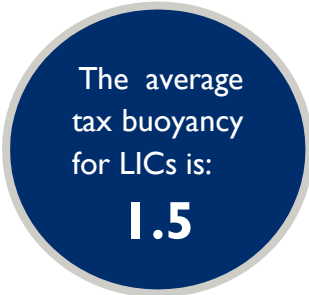
prevalent among resource-rich countries, such as Bahrain and Kuwait, as well as fragile countries, such as Afghanistan and Yemen.

¹² For countries with data on this variable. Taking the average value from 2012-2016.

TAX BUOYANCY

Tax buoyancy measures the extent to which total taxes increase as GDP rises. A tax buoyancy of 1.0 indicates that taxes rise in direct proportion to an increase in GDP. A tax buoyancy higher than 1.0 indicates that taxes are rising at a faster rate than growth in GDP.

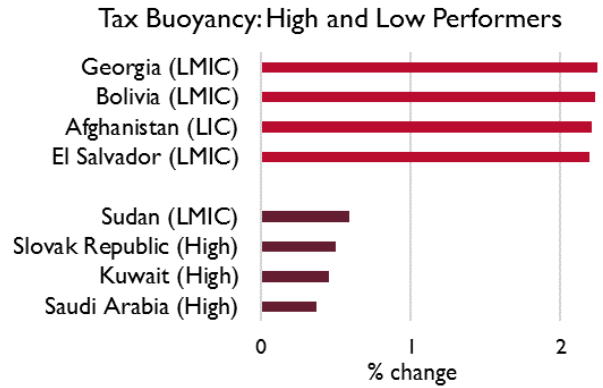
Taking the average value from 2008-2017, 68.5 percent of countries globally have a tax buoyancy exceeding 1.0, with 29.8 percent of those countries having a buoyancy exceeding 1.5, meaning that taxes are highly responsive to changes in GDP. Lower income countries tend to have higher tax buoyancies, averaging at 1.5, while high-income countries tend to have lower tax buoyancies, averaging at 1.2. There is



VAT BUOYANCY

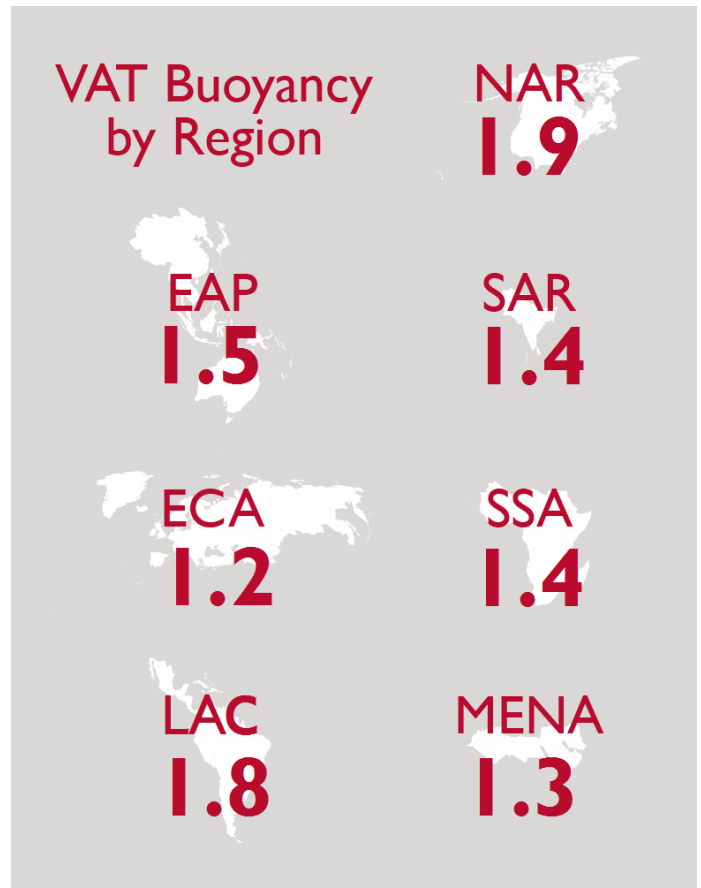
VAT buoyancy is a measure of the responsiveness of VAT revenues to an increase in GDP. Like tax buoyancy, it assesses how quickly VAT rises or falls as GDP increases. A buoyancy of 1.0 indicates that VAT is increasing in lock step with GDP. There is quite a bit more variation in VAT buoyancy than there is in tax buoyancy. Among countries with VAT, 73.5 percent have buoyancies of 1.0 or more, and about a third of those countries have buoyancies above 1.5.

Regionally, the NAR is estimated to have the highest VAT buoyancies, with an average VAT buoyancy of 1.9 over the period. ECA has the lowest average tax buoyancy at about 1.2, on average.



The tax buoyancy indicators measure the responsiveness of total taxes, VAT, CIT, and PIT to an increase in GDP, i.e. the percent change of tax revenue ($\% \Delta T$) divided by the percent change of the tax base or GDP ($\% \Delta Y$). CTD calculates buoyancy estimates based on 10-year rolling averages of the country's tax performance and economic growth.

considerable variation within each of these categories, however. For example, within lower middle-income countries, Sudan had a buoyancy of 0.6, while Georgia had an average buoyancy of 2.2, on average, over the period.



CIT AND PIT BUOYANCIES

CIT and PIT buoyancies, like the other buoyancies, estimate the increase in CIT and PIT collections for a given increase in GDP.

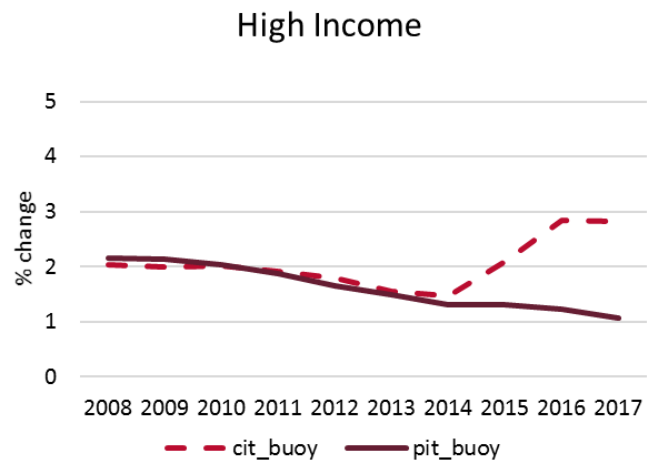
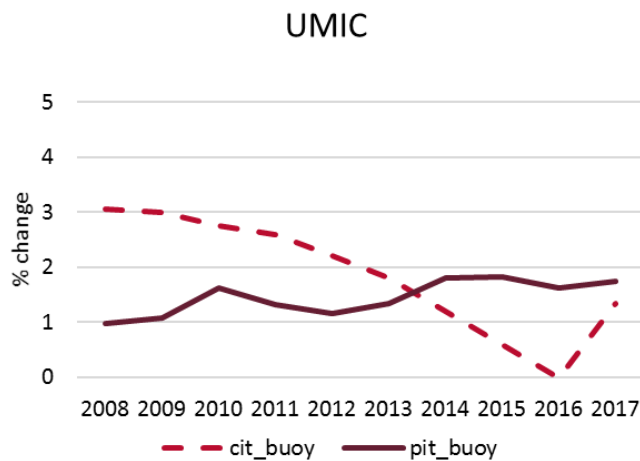
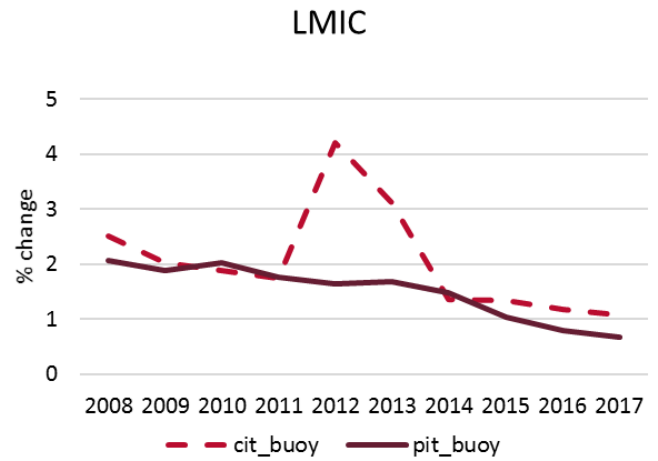
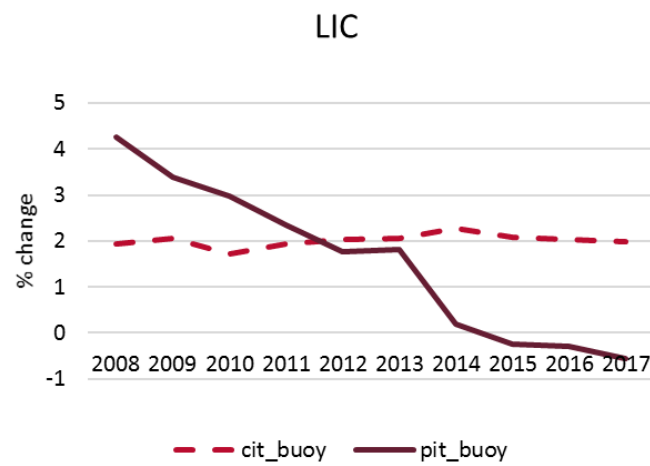
Trends in CIT and PIT vary substantially from country to country, based on the specific characteristics of a country's tax system. This is particularly the case with countries of different income levels. Over the 10-year period from 2008 through 2017, CIT and PIT buoyancies hovered around 1.0 over the period, and CIT buoyancies varied between 1.0 and just under 1.5.

There are also significant regional variations in CIT and PIT buoyancies. LAC was the top-performing region with average CIT and PIT buoyancies of 2.0 and 1.8 over the period, respectively.

SAR follows this with an average CIT buoyancy of 2.4 and average PIT buoyancy of 1.9. SSA has the lowest CIT and PIT buoyancies, both at 1.2.

LAC
has the highest average CIT and PIT Buoyancies at **2.8** and **1.9** respectively

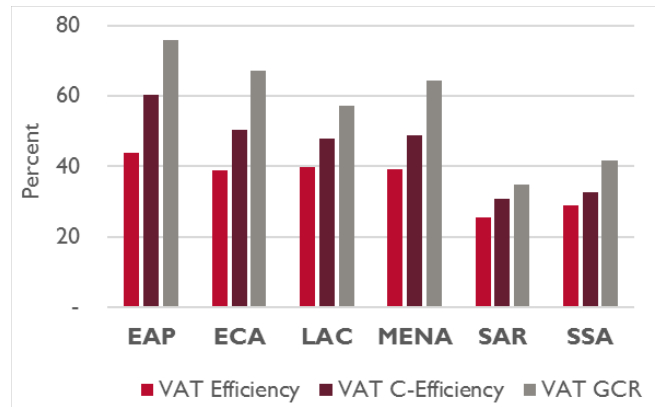
CIT buoyancy in LICs in the CTD sample has been quite steady, though PIT buoyancy has generally declined over the period. There was significant variability in the trend lines for LICs, LMICs and UMICs, indicating significant changes in country tax policies and conditions. CIT and PIT buoyancies were much more stable, on average, among high-income countries.



VAT EFFICIENCY

The VAT is one of the most common taxes, and is a major revenue generator in many countries. There are more than 150 countries globally that currently implement VAT or a VAT-like general sales tax. (See figure below). VAT is increasingly important in LICs and LMICs, with 20 LICs and 41 LMICs having VAT regimes in 2017. Given the importance of this tax, there are a number of specialized measures of VAT productivity that allow governments, researchers, and the public to better understand how effectively VAT is generating revenue.

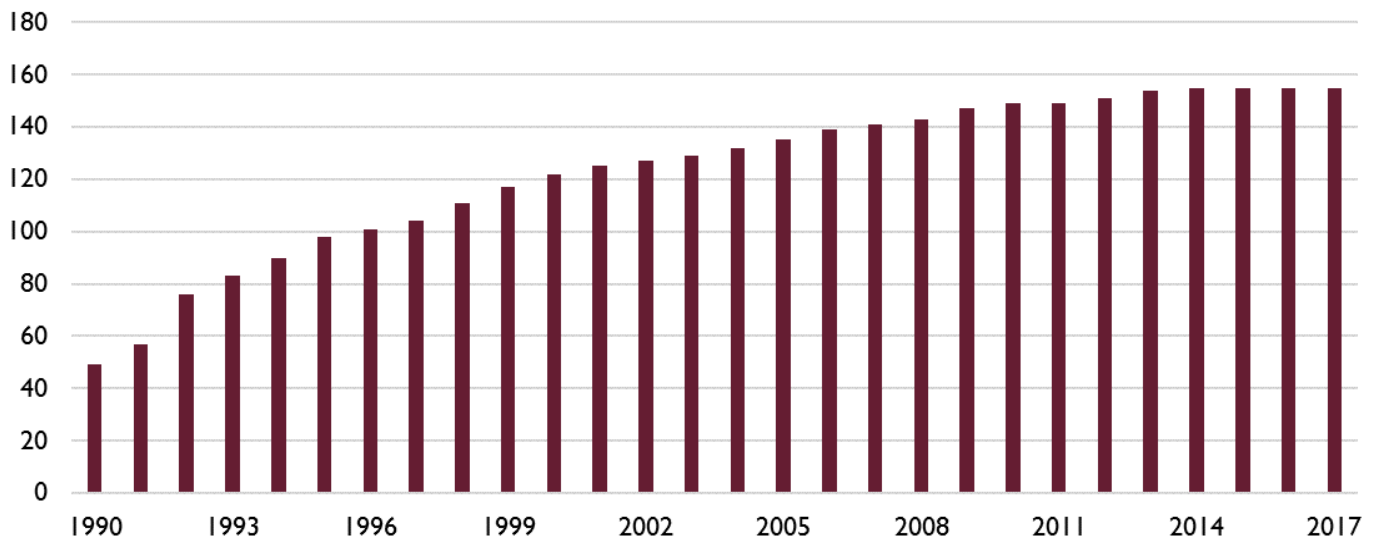
The first measure is VAT efficiency. It is calculated as the ratio of actual VAT collections to the potential revenues that would be derived from applying the standard VAT rate to GDP. In principle, a VAT with no exemptions, a single rate, and full compliance should result in efficiency ratios of close to 100 percent.



Regionally, EAP has the highest VAT efficiency, at 43.7 percent. This is followed closely by LAC, with a VAT efficiency of 39.8 percent. SAR has the lowest VAT efficiency, at 25.3 percent.

VAT efficiency, C-efficiency, and gross compliance rate measure the ratio of actual VAT collections in a country to the potential revenues that would be derived applying the standard VAT rate to GDP, total consumption, and private consumption, respectively.

Countries with VAT, 1990 - 2017



VAT C-EFFICIENCY

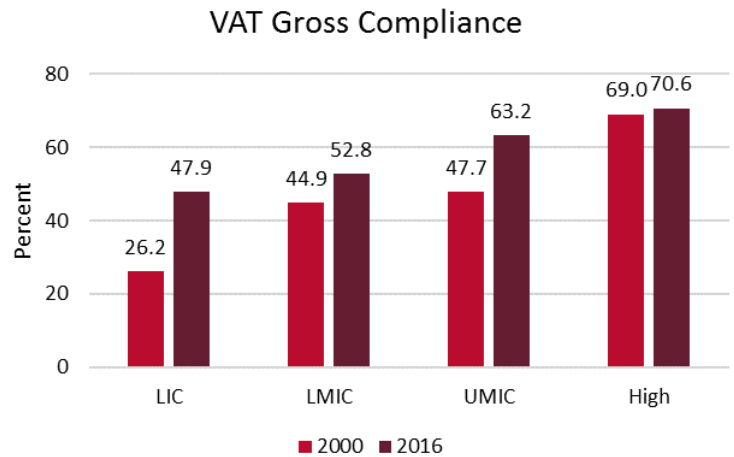
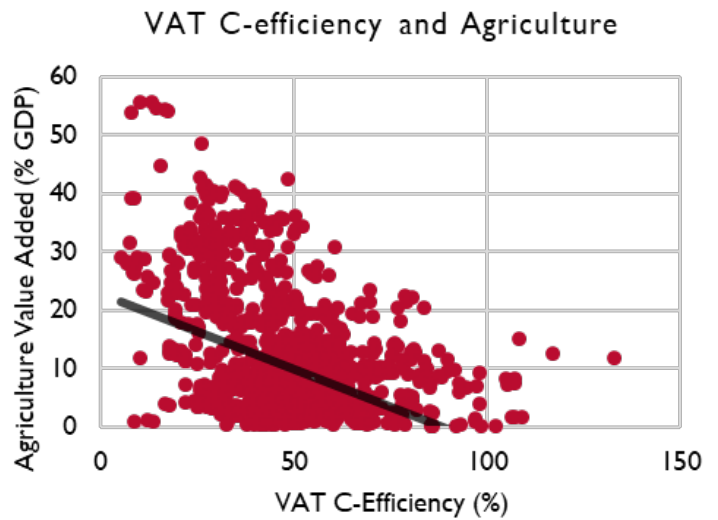
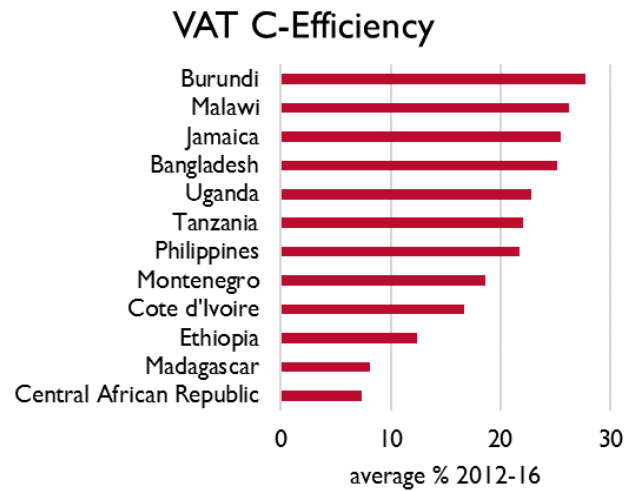
The second, and most widely used measure of VAT revenue productivity, is VAT C-efficiency. It is the ratio of actual VAT collections to the potential revenues estimated from applying the standard VAT rate to Total Consumption Expenditure. Like VAT efficiency, a VAT with no exemptions, a single rate, and full compliance should result in ratios close to 100 percent.

The average C-efficiency of CTD countries with a VAT is 47.3. These range from a low of 7.4 in Central African Republic to a high of 107.5 in Canada.¹³ C-efficiency tends to be lower in lower income countries. Of the 12 countries in the sample with the lowest VAT C-efficiency, seven are low-income countries and three are lower middle-income countries, and one is an upper middle-income country (see figure to the right).

VAT C-efficiency tends to be lower in countries with economies that are dominated by the agricultural sector. This may be due to less well-developed formal markets in these countries. The scatter plot to the right shows this negative relationship between agricultural value added and VAT C-efficiency.

VAT GROSS COMPLIANCE

VAT Gross Compliance Rate (GCR) is the third measure of VAT productivity. It is similar to VAT C-efficiency, with the distinction that it compares the actual VAT collections in the country to the potential revenues derived from applying the standard VAT rate to *Private* Consumption Expenditure, rather than *Total* Consumption. As with other measures of VAT productivity, VAT GCR is much higher in high and upper middle-income countries than in low and lower middle-income countries. In 2016, high income-countries had an average VAT GCR of 70.6 percent compared to LICs,



which had an average VAT GCR of 47.9 percent. All income groups, on average, have improved over the past 15 years, as shown in the graph above.

¹³ Average of 2012-16. In rare cases, a country's efficiency ratio can exceed 100, due to inclusion of investment in the VAT base or a break in the VAT chain (resulting in taxation of final and intermediate goods).

ILLUSTRATIVE ANALYSIS: CORRELATIONS AND REGRESSIONS

Beyond looking at individual country descriptive data, as well as regional and income group trends, users have the opportunity to explore correlations and regressions using data from nearly 200 countries. As noted in the *User's Guide to the Database* section above, the country codes included in the CTD allow for easy merging with other major data sources, such as the IMF's WoRLD or the World Bank's WDI dataset, for analysis. Some CTD correlation statistics are presented in the Annexes.

To demonstrate this type of analysis, the Leadership in Financial Management II mechanism (LPFM II) used a number of internationally-recognized development indicators to extract some illustrative findings from bivariate regressions.¹⁴ A word of caution: This type of analysis only establishes that there is a relationship between or among the variables chosen; it does not imply causation or address the direction of the relationship. The LPFM II findings demonstrate only a

small amount of what users are able to investigate with the CTD. Users are encouraged to explore relationships of interest to them using a combination of administration, policy, and external variables as needed.



ADMINISTRATION MEASURES

- Revenue authorities that are more autonomous have a positive relationship with tax-to-GDP and business efficiency, but contrary to expectations, no relationship was found with tax capacity, tax-to-GDP, property rights, corruption, or bureaucracy.
- Interestingly, for countries where revenue authorities describe themselves as organizationally function-based, that feature does not correlate significantly with higher tax-to-GDP, tax capacity, better business efficiency, stronger property rights, less corruption, or less bureaucracy.
- Contrary to expectations, revenue authorities with a large taxpayer unit in place have negative relationships with tax capacity, business efficiency, property rights, and there is no relationship with tax-to-GDP. However, they are likelier to have lower corruption levels.
- As expected, revenue authorities with e-services in place are associated with higher levels of tax collection and tax capacity, as well as greater business efficiency. But contrary to expectations, there is no relationship with hours to prepare/file taxes (an indicator found in the World Bank's *Doing Business* survey).
- The longer a VAT regime has been in place, the lower the cost of collection, and the higher the likelihood of having e-services in place.
- VAT age (i.e. how long the VAT has been in place) is positively associated with a higher amount of tax-to-GDP, VAT efficiency, and VAT gross compliance, which affirms the notion that the longer a country implements a VAT, the better it performs.

¹⁴ Some external variables from World Bank and IMF were used, including tax-to-GDP; corruption; business efficiency; debt; human development; and property rights. More information about the models LPFM II used for its bivariate regression analysis can be found in Annex 3.

PERFORMANCE MEASURES

- Across all of the tax performance indicators, there tends to be a strong relationship with GDP growth, meaning that as countries experience economic growth, they are more likely to have higher performing tax systems.
- Higher human development index (HDI) and life expectancy values have a positive relationship with nearly all of the tax performance indicators, demonstrating that there may be a linkage between tax systems and human development outcomes.
- All three VAT productivity measures (VAT efficiency, VAT C-efficiency, and VAT gross compliance) tend to be associated with stronger political rights and civil liberties.
- Strong property rights in a country tends to increase performance across all three VAT productivity measures.
- Being a resource-rich country is strongly associated with a higher level of tax capacity.
- Higher rates of Internet usage have a significant relationship with nearly all performance indicators, except tax effort.
- A Small Island Developing State (SIDS) is positively associated with having higher tax capacity and tax effort.
- GDP per capita is strongly related with almost all tax performance indicators – all except tax effort – which demonstrates a possible relationship between economic growth and the improvement of tax system performance, especially productivity and buoyancy measures.



ANNEX I: DATA AVAILABILITY

Indicator	EAP	EAC	LAC	MENA	NAR	SAR	SSA	LIC	LMIC	UMIC	High	Grand Total
Number of Observations												
tax_capacity	349	745	473	249	23	122	597	358	649	706	845	2558
tax_effort	288	640	428	225	22	112	544	321	573	613	752	2259
tax_buoy	467	839	592	308	36	127	738	430	769	862	1046	3107
vat_buoy	163	657	372	68	18	32	239	128	301	395	725	1549
cit_buoy	272	746	433	168	36	119	340	173	461	606	874	2114
pit_buoy	297	747	406	140	36	108	349	166	491	596	830	2083
vat_eff	184	614	346	83	15	42	300	168	364	404	648	1584
vat_c_eff	169	610	322	81	15	42	276	160	331	380	644	1515
vat_grc	169	614	322	81	15	42	278	162	335	380	644	1521
Number of Countries												
cost	15	33	18	5	3	4	19	10	20	21	46	97
payertostaff	10	28	5	3	3	5	10	6	12	17	29	64
labortostaff	21	44	13	7	2	5	13	6	26	27	46	105
poptostaff	21	44	18	7	3	5	14	6	26	30	50	112
function	27	50	28	17	3	8	38	22	46	44	59	171
ltu	26	46	34	16	3	8	40	24	47	47	55	173
customs	33	51	35	21	3	8	47	29	51	53	65	198
autonomy	34	52	35	19	3	8	46	28	50	53	66	197
e_reg	28	42	29	11	3	8	39	25	41	43	51	160
e_file	32	51	32	16	3	8	42	27	47	49	61	184
e_pay	29	45	31	16	3	8	41	26	46	44	57	173

Note: Observations are only counted for countries with data. Countries that have no VAT are reported as “N/a” in the database; these countries are not counted in the observations reported above. For more details, please see the database or the data visualization tool.

ANNEX 2: SUMMARY STATISTICS

	Global	EAP	ECA	LAC	MENA	NAR	SAR	SSA	LIC	LMIC	UMIC	High
tax_capacity	38.99	39.83	40.66	39.32	39.49	41.95	36.56	36.31	34.61	36.91	38.88	42.54
tax_effort	0.46	0.44	0.57	0.47	0.36	0.52	0.30	0.40	0.33	0.42	0.48	0.53
tax_buoy	1.26	1.27	1.14	1.53	1.00	0.93	1.42	1.28	1.54	1.24	1.28	1.15
vat_buoy	1.41	1.51	1.19	1.78	1.27	1.91	1.37	1.36	1.33	1.59	1.48	1.31
cit_buoy	1.93	1.87	1.93	2.47	2.01	1.52	2.37	1.16	2.15	1.94	1.87	1.93
pit_buoy	1.49	1.24	1.46	1.90	1.45	1.01	1.91	1.22	1.33	1.55	1.42	1.54
vat_eff	37.55	43.67	38.84	39.81	39.20	57.92	25.31	28.77	27.54	36.14	39.97	39.41
vat_c_eff	47.34	60.19	50.35	47.91	48.70	76.40	30.69	32.71	30.81	40.31	50.69	53.08
vat_grc	60.69	75.92	67.20	57.15	64.37	104.31	34.72	41.65	36.82	48.86	63.20	71.37
cost	1.69	1.22	1.06	1.05	3.98	0.67	1.56	2.26	2.24	2.31	1.23	1.06
payertostaff	774	723	629	1,256	345	1,565	700	202	374	541	598	809
labortostaff	2,709	2,561	778	2,438	2,207	1,321	6,040	3,617	6,222	3,063	1,544	1,150
poptostaff	5,670	5,122	1,613	3,720	5,939	2,476	12,701	8,121	12,289	7,341	3,068	2,238
function	77%	75%	75%	79%	59%	67%	75%	87%	82%	81%	75%	76%
ltu	82%	62%	89%	76%	69%	67%	88%	98%	100%	87%	83%	70%
customs	35%	27%	41%	26%	10%	0%	50%	53%	41%	39%	32%	32%
autonomy	39%	29%	46%	40%	0%	67%	50%	50%	46%	36%	38%	39%
e_reg	56%	54%	74%	66%	18%	67%	88%	33%	28%	43%	58%	77%
e_file	78%	75%	98%	91%	50%	100%	88%	52%	41%	74%	82%	93%
e_pay	77%	83%	91%	90%	56%	100%	75%	54%	35%	74%	84%	93%
tax_gdp	17.90	17.55	22.70	18.50	13.65	23.21	12.07	15.48	12.56	15.99	18.85	21.37

Note: Those marked with * are displayed as frequencies while the other variables are displayed as averages for the most recent year available. Tax/GDP is included as a reference.

ANNEX 3: BIVARIATE REGRESSION MODELS

PERFORMANCE MODEL

The panel bivariate models (across countries and time) can be estimated as follows using ordinary least squares (OLS):

$$CTD_{it} = \alpha + \beta_{1it}X_{it} + \delta_i + \varepsilon_{it}$$

where i indexes countries, t indexes time, CTD is the selected CTD variable (e.g. tax_capacity), X is a matrix of socio-economic and political macro-level variables, δ is fixed effects, and ε is the error term.

ADMINISTRATION MODEL

The cross-sectional model, across countries, is estimated as follows using OLS:

$$\diamond CTD_i = \alpha + \beta_{1i}X_i + \varepsilon_i$$

where i indexes countries, CTD is the administrative variable, X is a matrix of economic and political variables, and ε is the error term.