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Paying Taxes 2017

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Methodology and example calculations for each of the Paying Taxes sub-indicators

Paying Taxes records the taxes and mandatory contributions that a medium-size domestic company must pay in a given year, as well as measuring the administrative burden of paying taxes and contributions and complying with post-filing processes. The project was developed and implemented as part of the *Doing Business* project by the World Bank Group in cooperation with PwC. Taxes and contributions measured include corporate income and other profit taxes, social contributions and labour taxes paid by the employer, property taxes, property transfer taxes, dividend tax, capital gains tax, financial transactions tax, waste collection taxes, vehicle and road taxes, and any other small taxes or fees.

Paying Taxes measures all taxes and contributions that are mandated by government (at any level – federal, state or local) and that apply to the standardised business and have an impact on its financial statements. In doing so, *Paying Taxes* goes beyond the traditional definition of a tax. As defined for the purposes of government national accounts, taxes include only compulsory, unrequited payments to general government. *Paying Taxes* departs from this definition because it measures imposed charges that affect business accounts, not government accounts, with the main difference relating to labour contributions. The *Paying Taxes* measure includes government-mandated contributions paid by the employer to a requited private pension fund or workers' insurance fund. The indicator includes, for example, Australia's compulsory superannuation guarantee and workers' compensation insurance.

For the purpose of calculating the Total Tax Rate (defined later on), only taxes borne are included. For example, value-added taxes are generally excluded (provided they are not irrecoverable) because they do not affect the accounting profits of the business – that is, they are not reflected in the income statement. They are, however, included for the purpose of the compliance measures (time and payments), as they add to the burden of complying with the tax system.

The *Paying Taxes* study uses the *Doing Business* case study scenario to measure the taxes and contributions paid by a standardised business and the complexity of an economy's tax compliance system. This case study scenario uses a set of financial statements and assumptions about transactions made over the course of the year.

In each economy, tax experts from a number of different firms (including PwC) compute the taxes and mandatory contributions due in their jurisdiction based on the standardised case study facts. Information is also compiled on the frequency and method of filing and payments, as well as on the time taken to comply with tax laws in an economy, the time taken to request and process a VAT refund claim and the time taken to correct a minor error in the corporate income tax return including audit, if applicable. To make the data comparable across economies, several assumptions about the business and the taxes and contributions are used.

Assumptions about the business

The business:

- Is a limited liability, taxable company. If there is more than one type of limited liability company in the economy, the limited liability form most common among domestic firms is chosen. The most common form is reported by incorporation lawyers or the statistical office.
- Started operations on 1 January 2014. At that time the company purchased all the assets shown in its balance sheet and hired all its workers.
- Operates in the economy's largest business city and the second largest business city for large economies, defined as those with a population of more than 100 million. These economies comprise: Bangladesh, Brazil, China, India, Indonesia, Japan, Mexico, Nigeria, Pakistan, the Russian Federation, and the United States.
- Is 100% domestically owned and has five owners, all of whom are individuals.
- At the end of 2014, has a start-up capital of 102 times income per capita.
- Performs general industrial or commercial activities. Specifically, it produces ceramic flowerpots and sells them at retail. It does not participate in foreign trade (no import or export) and does not handle products subject to a special tax regime, for example, alcohol or tobacco.
- At the beginning of 2015, owns two plots of land, one building, machinery, office equipment, computers and one truck and leases one truck.

Paying Taxes measures all taxes and contributions that are mandated by government (at any level – federal, state or local) and that apply to the standardised business and have an impact on its financial statements.

- Does not qualify for investment incentives or any benefits apart from those related to the age or size of the company.
- Has 60 employees – four managers, eight assistants and 48 workers. All are nationals, and one manager is also an owner. The company pays for additional medical insurance for employees (not mandated by any law) as an additional benefit. In addition, in some economies reimbursable business travel and client entertainment expenses are considered fringe benefits. Where applicable, it is assumed that the company pays the fringe benefit tax on this expense or that the benefit becomes taxable income for the employee. The case study assumes no further salary additions for meals, transportation, education or others. Therefore, even when such benefits are frequent, they are not added to or removed from the taxable gross salaries to arrive at the labour tax or contribution calculation.
- Has a turnover of 1,050 times income per capita.
- Makes a loss in the first year of operation.
- Has a gross margin (pre-tax) of 20% (that is, sales are 120% of the cost of goods sold).
- Distributes 50% of its net profits as dividends to the owners at the end of the second year.
- Sells one of its plots of land at a profit at the beginning of the second year.
- Is subject to a series of detailed assumptions on expenses and transactions to further standardise the case study. All financial statement variables are proportional to income per capita. For example, the owner who is also a manager spends 10% of income per capita on travelling for the company (20% of these owner's expenses are purely private, 20% are for entertaining customers and 60% for business travel).

Assumptions about the taxes and contributions

- All the taxes and contributions recorded are those paid in the second year of operation (calendar year 2015). A tax or contribution is considered distinct if it has a different name or is collected by a different agency. Taxes and contributions with the same name and agency, but charged at different rates depending on the business, are counted as the same tax or contribution.
- The number of times the company pays taxes and contributions in a year is the number of different taxes or contributions multiplied by the frequency of payment (or withholding) for each tax. The frequency of payment includes advance payments (or withholding) as well as regular payments (or withholding).

The Paying Taxes sub-indicators

Tax payments

The tax payments sub-indicator reflects the total number of taxes and contributions paid, the method of payment, the frequency of payment, the frequency of filing and the number of agencies involved for this standardised case study company during the second year of operation. It includes taxes withheld by the company, such as sales tax, value-added tax and employee-borne labour taxes. These taxes are traditionally collected by the company from the consumer or employee on behalf of the tax agencies. Although they do not affect the income statements of the company, they add to the administrative burden of complying with the tax system and so are included in the tax payments measure.

The number of payments takes into account electronic filing. Where full electronic filing and payment is allowed and it is used by the majority of medium-size businesses, the tax is counted as paid once a year even if filings and payments are more frequent. For payments made through third parties, such as tax on interest paid by a financial institution or fuel tax paid by a fuel distributor, only one payment is included even if payments are more frequent. Costa Rica is used as an example in Table 1.

Table 1

Costa Rica: Number of payments

Tax type	World Bank indicator	Actual payments	Notes
General sales tax (GST)	1	12	online
Corporate income tax	1	4	online
Employer paid – social security contributions	1	12	online
Employee paid – social security contributions	0	12	jointly
Employer paid – workers' insurance contribution	1	1	
Municipal patent licence	1	4	online
Tax on land property	1	4	online
Highway tax	1	1	
Property transfer tax	1	1	
Stamp duty	1	1	
Total	**9**	**52**	

Time

Time is recorded in hours per year. The sub-indicator measures the time taken to prepare, file and pay three major types of taxes and contributions: corporate income tax, value added or sales tax, and labour taxes, including payroll taxes, social contributions and personal income tax. Preparation time includes the time to collect all information necessary to compute the tax payable and to calculate the amount payable. If separate accounting books must be kept for tax purposes – or separate calculations made – the time associated with these processes is included.

This extra time is included only if the regular accounting work is not enough to fulfil the tax accounting requirements. Filing time includes the time to complete all necessary tax return forms and file the relevant returns at the tax authority. Payment time considers the hours needed to make the payment online or in person. Where taxes and contributions are paid in person, the time includes delays while waiting. Ecuador is used as an example in Table 2.

Total Tax Rate

The Total Tax Rate measures the amount of taxes and mandatory contributions borne by the business in the second year of operation, expressed as a share of commercial profit. *Paying Taxes 2017* reports the Total Tax Rate for calendar year 2015. The total amount of taxes borne is the sum of all the different taxes and contributions payable after accounting for allowable deductions and exemptions. The taxes withheld (such as personal income tax) or collected by the company and remitted to the tax authorities (such as value-added tax, sales tax or goods and service tax) but not borne by the company are excluded. The taxes included can be divided into five categories: profit or corporate income tax, social contributions and labour taxes paid by the employer (in respect of which all mandatory contributions are included, even if paid to a private entity such as a requited pension fund), property taxes, turnover taxes and other taxes (such as municipal fees and vehicle and fuel taxes).

The Total Tax Rate is designed to provide a comprehensive measure of the cost of all the taxes a business bears. It differs from the statutory tax rate, which merely provides the factor to be applied to the tax base. In computing the Total Tax Rate, the actual tax payable is divided by commercial profit.

Table 2

Ecuador: Time to comply (hours)

Tax type	Corporate income tax	Labour taxes	Consumption tax	Total
Compliance process				
Preparation				
Data gathering from internal sources (for example accounting records) if held	5	25	30	
Additional analysis of accounting information to highlight tax sensitive items	5	25	30	
Actual calculation of tax liability including inputting data into software/ spreadsheets or hard copy records	15	50	30	
Time spent maintaining/updating accounting systems for changes in tax rates and rules	5	-	30	
Preparation and maintenance of mandatory tax records, if required	10	50	20	
Other activities undertaken to comply with tax regulations in local economy: Transactional annex to be filed on a monthly basis	48	6	0	
Total	**88**	**156**	**140**	**384**
Filing				
Completion of tax return forms	18	81	55	
Time spent submitting forms to tax authority, which may include time for electronic filing, waiting time at tax authority office etc.	2	24	15	
Total	**20**	**105**	**70**	**195**
Payment				
Calculations of tax payments required including, if necessary, extraction of data from accounting records	4	23	10	
Analysis of forecast data and associated calculations if advance payments are required	4	20	10	
Time to make the necessary tax payments, either online or at the tax authority office (include time for waiting in line and travel if necessary)	2	2	10	
Total	**10**	**45**	**30**	**85**
Grand total	**118**	**306**	**240**	**664**

Commercial profit is essentially net profit before all taxes borne. It differs from the conventional profit before tax, reported in financial statements. In computing profit before tax, many of the taxes borne by a firm are deductible. In computing commercial profit, these taxes are not deductible. Commercial profit therefore presents a clear picture of the actual profit of a business before any of the taxes it bears in the course of the fiscal year.

Commercial profit is computed as sales minus cost of goods sold, minus gross salaries, minus administrative expenses, minus other expenses, minus provisions, plus capital gains (from the property sale), minus interest expense, plus interest income and minus commercial depreciation.

To compute the commercial depreciation, a straight-line depreciation method is applied, with the following rates: 0% for the land, 5% for the building, 10% for the machinery, 33% for the computers, 20% for the office equipment, 20% for the truck and 10% for business development expenses. Commercial profit amounts to 59.4 times income per capita. Côte d'Ivoire is used as an example in Table 3.

The methodology for calculating the Total Tax Rate is broadly consistent with the Total Tax Contribution framework[68] developed by PwC and the calculation within this framework for taxes borne. But while the work undertaken by PwC is usually based on data received from the largest companies in an economy, *Doing Business* focuses on a case study for a standardised medium-size company.

Since *Paying Taxes 2014*, fuel tax has not been considered for the purpose of the Total Tax Rate calculations because of the difficulty of computing these taxes in a consistent way across all of the economies covered. The amounts involved are also in most cases very small. Fuel taxes continue to be counted in the payments sub-indicator.

Table 3

Côte d'Ivoire: Total Tax Rate

	CFA '000	CFA '000
Profit before tax (PBT)		20,786
Add back above the line taxes borne		
Tax on money market account interest	153	
Social security contributions paid by employer	7,519	
Payroll tax paid by employer	913	
Tax on insurance premium	121	
Business licence tax	3,761	
Real estate tax on developed land	460	
Real estate tax on undeveloped land	274	
Advertising tax	192	
Special tax on equipment	639	
Real estate transfer tax	1,314	
		15,346
Commercial profit (profit before all taxes borne)		36,132
Corporate income tax on PBT after necessary adjustments	(3,194)	
Above the line taxes borne	(15,346)	
Total taxes borne		**(18,540)**
Profit after tax		**17,592**
Total Tax Rate = total taxes borne/commercial profit		**51.31%**

[68] www.pwc.com/totaltaxcontribution

Post-filing index

The post-filing index measures two processes based on four components – time to comply with a VAT or GST refund, time to obtain VAT or GST refund, time to comply with the correction of an inadvertent corporate income tax error and the time to complete a corporate income tax audit if required. If both VAT (or GST) and corporate income tax apply, the post-filing index is the simple average of the distance to frontier scores for each of the four components. If only VAT (or GST) or corporate income tax applies, the post-filing index is the simple average of the scores for only the two components pertaining to the applicable tax. If neither VAT (or GST) nor corporate income tax applies, the post-filing index is not included in the ranking of the ease of paying taxes.

The value of each component is transformed into a distance to frontier score between 0 and 100 as explained later in this section. A score of 100 represents the most efficient process and a score of 0 the least efficient process. The overall post-filing index distance to frontier score is the average of the component scores.

The index is based on two additional separate scenarios for the case study with the following assumptions.

Assumptions about the VAT refund process

- In June 2015, TaxpayerCo. makes a large capital purchase: one additional machine for manufacturing pots.
- The value of the machine is 65 times income per capita of the economy.
- Sales are equally spread per month (that is, 1,050 times income per capita divided by 12).
- Cost of goods sold are equally expensed per month (that is, 875 times income per capita divided by 12).
- The seller of the machinery is registered for VAT or goods and services (GST).
- Input VAT will exceed output VAT in June 2015.
- Excess input VAT incurred in June will be fully recovered after four consecutive months if the VAT rate is the same for inputs, sales and the machine and the tax reporting period is every month.

Assumptions about the corporate income tax audit process

- An error in the calculation of the income tax liability (for example, use of incorrect tax depreciation rates, or incorrectly treating an expense as tax deductible) leads to an incorrect income tax return and consequently an underpayment of corporate income tax.
- TaxpayerCo. discovered the error and voluntarily notified the tax authority of the error in the corporate income tax return.
- The value of the underpaid income tax liability is 5% of the corporate income tax liability due.
- TaxpayerCo. submits the corrected information after the deadline for submitting the annual tax return, but within the tax assessment period.

Time to comply with a VAT refund

Time is recorded in hours and covers two elements:

- **The process of claiming a VAT or GST refund**, including time spent by TaxpayerCo. on:
  - gathering VAT information from internal sources;
  - any additional analysis of accounting information;
  - calculating the VAT refund amount;
  - preparing the VAT refund claim;
  - preparing any additional documents needed to substantiate the VAT refund claim;
  - making representation at the tax office, if required; and
  - completing any other mandatory activities or tasks associated with the VAT or GST refund.

- **The process of an audit (if the case scenario is likely to trigger an audit),** including time spent by TaxpayerCo.in:
  - gathering information required by the tax auditor;
  - preparing any documentation (information such as receipts, financial statements, pay stubs) as required by the tax auditor; and
  - submitting the documents requested by the auditor.

Some specific points to note:
A total estimate of zero hours is recorded if the process of claiming a VAT or GST refund is done automatically within the standard VAT or GST return without the need to complete any additional section or part of the return, no additional documents or tasks are required as a result of the input tax credit and the case scenario is unlikely to trigger an audit. Where taxpayers are required to submit a specific form or additional documents for a VAT refund request, it is assumed that these are submitted at the same time as the VAT return.

Where an audit is thought likely to take place, an estimate of half an hour is recorded if documents are submitted electronically in a matter of minutes. An estimate of zero hours is recorded if documents are submitted in person at the taxpayer's premises during a field audit. See Indonesia as an example of compliance time for a VAT refund in Table 4.

Time to obtain a VAT refund

Time is recorded in weeks. Time measures the total waiting time to receive a VAT or GST refund from the moment the request has been submitted.

The time includes an average waiting time to submit the refund claim. This is equal to half the time between the filing of VAT returns. For example, the waiting time is half a month if the VAT or GST return is filed monthly, and three months if the VAT or GST return is filed every six months.

Time includes the mandatory carry forward time before a VAT refund in cash can be paid. The carry forward time is zero if there is no mandatory carry forward period.

If the case scenario is likely to trigger an audit, time also includes:

- time spent by TaxpayerCo. interacting with the auditor from the moment an audit begins until there are no further interactions between TaxpayerCo. and the auditor (including the various rounds of interactions between TaxpayerCo. and the auditor); and
- time spent waiting for the tax auditor to issue the final tax assessment from the moment TaxpayerCo. has submitted all relevant information and documents and there are no further interactions between TaxpayerCo. and the auditor.

As an example, Table 5 shows the calculation of the time to obtain a VAT refund for Indonesia.

Table 4

Indonesia, Jakarta: Time to comply with a VAT refund	(hours)
Time spent gathering information from internal sources, including analysis of accounting information and calculation of the VAT refund amount	0
Preparing the refund claim	0
Preparing documents to substantiate the claim for the refund	4
Time spent making representations at the tax office	0
Completing any other mandatory activities or tasks associated with the refund including responding to any resultant audit	0
If the refund triggers an audit:	
Gathering information and preparing documentation as required by the tax auditor	12
Time spent submitting documents requested by the tax auditor	2
Total	**18**

Table 5

Indonesia, Jakarta: Time to obtain a VAT refund	(weeks)
Time waiting for submitting the refund claim (monthly)	2.2
Mandatory carry forward period	0
Interacting with the tax auditor since the audit begins until there are no further interactions	25.7
Waiting for the tax auditor to issue the final tax assessment from the moment there are no further interactions between the taxpayer and the tax authority	3.0
Total	**30.9**

As for the other components of the post-filing index, the time to obtain a VAT refund is converted into a distance to frontier score between 0 and 100. A score of 100 represents the most efficient process and a score of 0 the least efficient process.

Economies that are not scored for the VAT post-filing components

There are some instances where the case study company is not scored on the two components for a VAT or GST refund process:

- If an economy does not have a VAT or GST;
- If an economy has a VAT or GST, but the purchase of a machine is not subject to VAT; or
- If an economy has a VAT or GST that was introduced in calendar year 2015, but there is insufficient data to assess the refund process.

Economies that receive a score of zero for the VAT post-filing components

There are some instances where an economy has a VAT or GST system, but the refund will not be available to TaxpayerCo. for one of the following reasons:

- the ability to claim a refund is restricted to specific categories of taxpayers that do not include TaxpayerCo.;
- TaxpayerCo. is eligible to claim a refund, but cash refunds do not occur in practice;
- There is no refund mechanism in place;
- Input tax on a capital purchase is a cost on the business; and
- TaxpayerCo. must carry forward the excess input tax for four months or more before a cash refund can be requested.

If any of these scenarios apply, the economy will receive a distance to frontier score of zero for both VAT components of the post-filing index.

Economies will also receive a distance to frontier score of zero for a component if the time for that component falls within the top (most time-consuming) 5% of data for that component.

Time to comply with corporate income tax audit

Time is recorded in hours. The indicator has two parts:

- **The process of notifying the tax authorities of the error, amending the return and making additional payment,** including time spent by TaxpayerCo.:
  - gathering information;
  - preparing the documents required to notify the tax authorities;
  - submitting the documents; and
  - making the additional tax payment.

- **The process of an audit (if the case scenario is likely to trigger an audit)**, including time spent by TaxpayerCo.:
  - gathering information as required by the tax auditor;
  - preparing any documentation (information such as receipts, financial statements, pay stubs) as required by the tax auditor; and
  - submitting the documents requested by the auditor.

An estimate of half an hour is recorded for submission of documents or payment of the income tax liability due if the submission or payment is done electronically and takes several minutes. An estimate of zero hours is recorded in the case of a field audit if documents are submitted in person and at the taxpayer's premises. Table 6 shows an example of a calculation for Hungary.

Table 6

Hungary: Time to comply with a CIT audit	(hours)
Information gathering and document preparation required to notify the tax authorities	3
Submission of relevant documents required for the correction	0.5
Time spent making payments	0.5
If the correction triggers an audit, time is spent on:	
Gathering information and preparing documents as required by the tax auditor	8
Submission of documents requested by the tax auditor	0
Total	**12**

Time to complete a corporate income tax audit, where applicable

Time is recorded in weeks. Time includes the time spent by TaxpayerCo. interacting with the auditor from the moment an audit begins until there are no further interactions between TaxpayerCo. and the auditor (including the various rounds of interactions between TaxpayerCo. and the auditor). Time also includes the time spent waiting for the tax auditor to issue the final tax assessment – from the moment TaxpayerCo. has submitted all relevant information and documents and there are no further interactions between TaxpayerCo. and the auditor.

If an economy does not levy corporate income tax, the economy will not be scored on the two corporate income tax components.

Time to complete a corporate income tax audit is recorded as zero if the case study scenario is unlikely to trigger an audit. Table 7 shows an example for Hungary.

Ranking calculation and the distance to frontier measure

This report presents in Appendix 3 the results for two aggregate benchmark measures: the World Bank's distance to frontier (DTF) measure and the ease of doing business ranking, which since *Paying Taxes 2015*, has been based on the DTF measure.[69] The ease of doing business ranking, including the ranking for *Paying Taxes*, compares economies with one another; while the DTF score benchmarks economies with respect to regulatory best practice, showing the absolute distance to the best performance on each *Doing Business* indicator. Both measures can be used for comparisons over time. When compared across years, the DTF measure shows how much the regulatory environment for local entrepreneurs in each economy has changed over time in absolute terms, while the ease of paying taxes ranking can show only how economies have changed relative to one another.

The ranking of economies on the ease of paying taxes is determined by sorting their DTF scores on paying taxes, rounded to 2 decimals. These scores are the simple average of the distance to frontier scores for each of the sub-indicators (number of payments, time, Total Tax Rate, and post-filing index) with a threshold being applied to the Total Tax Rate sub-indicator as explained below.

The frontier underlying each DTF score is derived from the most efficient practice or highest score achieved on the *Paying Taxes* sub-indicators by any economy for all years included in the analysis up to and including *Doing Business 2015*. In *Paying Taxes*, for example, Hong Kong SAR, (China) and Saudi Arabia have achieved the highest performance on the number of payments (3 payments), United Arab Emirates on time (12 hours) and Vanuatu on the Total Tax Rate (8.5%). For the distance to frontier score of the post-filing index, Barbados, Croatia and several other economies have the highest score for time to comply with VAT refund (100), Austria on the time to obtain a VAT refund (100), and Estonia, Lithuania, and several other economies on the time to comply with the corporate income tax return audit and time to complete the corporate income tax audit (100).

Calculating the distance to frontier score for each economy involves rescaling the four sub-indicators to a common unit as show below. The four scores are then averaged to give the overall DTF score.

Table 7

Hungary: Time to complete CIT audit	(weeks)
Interacting with the tax auditor from the start of the audit until there are no further interactions	0.7
Waiting for the tax auditor to issue the final tax assessment from the moment of the last interaction between the taxpayer and the tax authority	8
Total	**8.7**

[69] We have also included the distance to frontier score and the ease of doing business ranking without post-filing so as to provide an easier comparison with last year's scores and rankings.

The worst performance for each sub-indicator is defined as the 95th percentile for each component of the pooled data for all economies for all the years included in the analysis. All distance to frontier calculations are based on a maximum of five decimals. However, the ease of paying taxes ranking calculation is based on two decimals.

The difference between an economy's distance to frontier score in any previous year and its score on the *Paying Taxes* indicator for 2015 illustrates the extent to which the economy has closed the gap to the frontier over time. And in any given year the score measures how far an economy is from the highest performance. The distance to frontier measure can also be used for comparisons across economies in the same year, complementing the ease of paying taxes ranking.

The DTF score for the number of payments and time to comply sub-indicators

The *Paying Taxes* sub-indicators for the number of payments and time to comply are rescaled to a common unit using a linear transformation: (max – y)/(max – min), with the minimum value (min) representing the frontier – the highest performance on that sub-indicator across all economies for all years included in the analysis up to and including *Doing Business 2015*. For the time to pay taxes, the frontier is defined as the lowest time recorded among all economies that levy the three major taxes: profit tax, labour taxes and mandatory contributions, and value-added tax (VAT) or sales tax.

The DTF score for the Total Tax Rate

For the Total Tax Rate, the frontier is defined as the Total Tax Rate at the 15th percentile of the overall distribution of Total Tax Rates for all years included in the analysis up to and including *Doing Business 2015*, which is 26.1%. All economies with a Total Tax Rate below this threshold receive the same score as the economy at the threshold. Additionally, above the threshold, the Total Tax Rate is included in the ranking in a non-linear fashion.

The Total Tax Rate threshold and the non-linear transformation are not based on any economic theory of an 'optimal tax rate' that minimises distortions or maximises efficiency in an economy's overall tax system. Instead, they are largely empirical in nature, with the threshold set at the lower end of the distribution of tax rates levied on medium-size enterprises in the manufacturing sector as observed through the paying taxes indicators. These calculations reduce the bias in the Total Tax Rate sub-indicator toward economies that do not need to levy significant taxes on companies like the *Doing Business* standardised case study company because they raise public revenue in other ways – for example, through taxes on foreign companies, through taxes on sectors other than manufacturing or from natural resources (all of which are outside the scope of the methodology). They also take into account the needs of governments to collect taxes from all firms.

Since *Paying Taxes 2015*, the Total Tax Rate component of the paying taxes indicator is transformed in a non-linear fashion before it enters the distance to frontier score for *Paying Taxes*. As a result of the non-linear transformation, an increase in the Total Tax Rate has a smaller impact on the distance to frontier score for the Total Tax Rate – and therefore on the distance to frontier score for *Paying Taxes* – for economies with a below-average Total Tax Rate than it would have in the calculation done in previous years (line B is smaller than line A in Figure 59). And for economies with an extreme Total Tax Rate (a rate that is very high relative to the average), an increase has a greater impact on both these distance to frontier scores than before (line D is bigger than line C in Figure 59).

Distance to frontier (DTF)

The overall DTF for the time to comply, the number of payments and each of the four components of the post-filing index is computed as:

$100 * (max - y) / (max - min)$

Where y := **sub-indicator value for a given economy**

DTF for the Total Tax Rate (TTR) is computed as:

$TTR^{DTF} = 100 * [(max - y) / (max - min)]^{0.8}$

For a TTR value below the 15th percentile, TTR^{DTF} is set at 100.

The post-filing index DTF takes the form:[3]

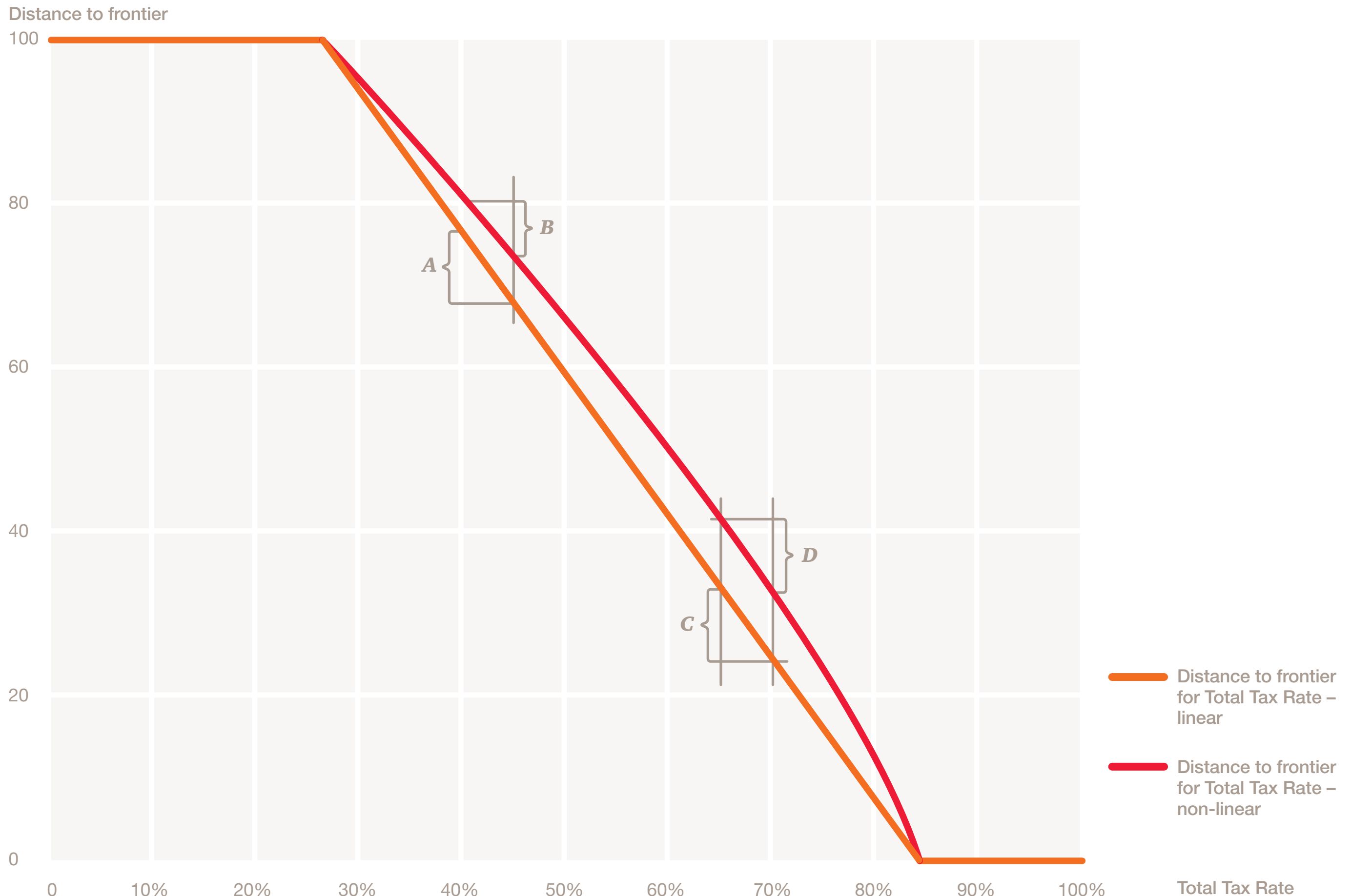
$Post\text{-}filing\ Index^{DTF} = 1/4\ [VAT\ Comply^{DTF} + VAT\ Obtain^{DTF} + CIT\ Comply^{DTF} + CIT\ Complete^{DTF}]$

The overall *Paying Taxes* DTF will then take the form;

$Paying\ Taxes^{DTF} = 1/4\ [TTR^{DTF} + Time^{DTF} + Payments^{DTF} + Post\text{-}filing\ Index^{DTF}]$

Figure 59

How the non-linear transformation affects the distance to frontier score for the Total Tax Rate



Note: The non-linear distance to frontier for the Total Tax Rate is equal to the distance to frontier for the Total Tax Rate to the power of 0.8.
Source: *Doing Business* database.

The DTF score for the post-filing index

Each of the four components of the post-filing index is rescaled to a common unit using a linear transformation: (max – y)/(max – min), with the minimum value (min) representing the frontier – the highest performance on that component.

For each economy the scores obtained for the four indicators are aggregated through simple averaging into one distance to frontier score. An economy's distance to frontier score is indicated on a scale from 0 to 100, where 0 represents the lowest performance and 100 the frontier. To mitigate the effects of extreme outliers in the distributions of the rescaled data, the worst performance (i.e. the max) is calculated after the removal of outliers which are defined as being in excess of the 95th percentile. This year, the max is defined as follows for the four components of the index:

- Time to comply with a VAT refund: 50 hours
- Time to obtain a VAT refund: 55 weeks
- Time to comply with a CIT audit: 56 hours
- Time to complete a CIT audit: 32 weeks

Changes to Paying Taxes methodology over time

The base for the financial statements and GNIpc

The case study company's financial statements are based upon the gross national income per capita (GNIpc) in each economy. Turnover, for example, is assumed to be 1,050 times GNIpc giving, after deducting various expenses, a commercial profit of 59.4 times GNIpc. For the years 2004 to 2011 the GNIpc value for 2005 has been used.

For the years 2012 to 2015, the 2012 value in each economy has been used so that the study reflects more accurately the current economic conditions. In the future the GNIpc will be updated every three years.

In some economies, updating the GNIpc to the 2012 value was not sufficient to bring the salaries of all the case study employees up to the minimum wage thresholds that exist in those economies. In those instances an additional multiple of two or three times the GNIpc has been used.

Expanding the sample of cities covered for large economies.

Since its inception the World Bank Group's *Doing Business* study has focused on the largest business city of each economy. Depending on the indicator and the size of the economy, this focus can be a limitation in extrapolating results to the economy level. As the subnational *Doing Business* reports prepared by the World Bank have shown, the indicators measuring the procedures, time and cost to complete a transaction (such as the dealing with construction permits indicators) tend to show more variation across cities within an economy than do indicators capturing features of the law applicable nationwide (such as the protecting minority investors or resolving insolvency indicators). Moreover, this limitation is likely to be more important in larger economies:

- where the largest business city is likely to represent a smaller share of the overall economy, and
- and in those with greater regional diversity in business practices.

To address this issue, from 2015, *Doing Business* including the *Paying Taxes* indicator has expanded its sample of cities in large economies, defined as those with a population of more than 100 million in 2013. These include: Bangladesh, Brazil, China, India, Indonesia, Japan, Mexico, Nigeria, Pakistan, the Russian Federation and the United States. For each of these economies the sample now includes the second largest business city. Population size was used as the criterion for selecting these economies for two main reasons: First, economies with a large population, because of their size and diversity, are more likely to have differences in performance on indicators. Second the larger the population in an economy, the larger the number of people who can benefit from improvements in business regulation.

Within each economy the second city was also selected on the basis of population size and must be in a different metropolitan area from the largest business city.[70]

For an economy represented by two cities, both sets of data for the sub-indicators are available and are disclosed in Appendix 3. Both cities are also included in the economy's ranking calculation.

Calculation of scores and ranking for economies with two cities covered.

For each of the 11 economies for which a second city is included, the distance to frontier score is calculated as the population-weighted average of the distance to frontier scores for the two cities covered (Table 8). This is done for the scores for each of the component sub-indicators: number of payments, time, Total Tax Rate, and post-filing index. The table below shows the city data for the 11 economies (see the data table appendix for the weighted average number of each economy).

Table 8

	Economy	Population	Weight
Bangladesh	Dhaka	14,730,537	78%
	Chittagong	4,106,060	22%
Brazil	Sao Paulo	19,659,808	61%
	Rio de Janeiro	12,373,884	39%
China	Shanghai	19,979,977	55%
	Beijing	16,189,572	45%
India	Mumbai	19,421,983	47%
	Delhi	21,935,142	53%
Indonesia	Jakarta	9,629,953	78%
	Surabaya	2,768,199	22%
Japan	Tokyo	36,833,979	65%
	Osaka	19,491,722	35%
Mexico	Mexico City	20,131,688	83%
	Monterrey	4,112,643	17%
Nigeria	Lagos	10,780,986	77%
	Kano	3,220,929	23%
Pakistan	Karachi	14,080,737	65%
	Lahore	7,487,415	35%
Russian Federation	Moscow	11,461,264	70%
	Saint Petersburg	4,871,556	30%
United States	New York	18,365,262	60%
	Los Angeles	12,160,151	40%

Source: United Nations, Department of Economic and Social Affairs, Population Division, World Urbanization Prospects, 2014 Revision, "File 12: Population of Urban Agglomerations with 300,000 Inhabitants or More in 2014, by Country, 1950-2030 (thousands). Available at http://esa.un.orh/unpd/wup/CD-ROM/Default.aspx

[70] Where the second and third largest cities were very close in population size, the GDP of the city or relevant state was used to determine which city was the second largest business city.

World Bank Group Paying Taxes team

Rita Ramalho
Joanna Nasr
Nadia Novik
Emily Jane Bourke
Rodrigo A. Sarmento de Beires
Edgar Chavez

PwC Paying Taxes team

Neville Howlett
Tom Dane
Gwendolin Chau
Sopheaktra Meas

The Total Tax Rate included in the survey by the World Bank Group has been calculated using the broad principles of the PwC methodology. The application of these principles by the World Bank Group has not been verified, validated or audited by PwC, and therefore, PwC cannot make any representations or warranties with regard to the accuracy of the information generated by the World Bank Group's models. In addition, the World Bank Group has not verified, validated or audited any information collected by PwC beyond the scope of *Doing Business Paying Taxes* data, and therefore, the World Bank Group cannot make any representations or warranties with regard to the accuracy of the information generated by PwC's own research.

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