

# TaxDev

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## Effective tax rates and firm size: the case of the Dominican Republic



# Effective Tax Rates and Firm Size: The Case of the Dominican Republic<sup>1</sup>

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## Abstract

**Do some firms pay more corporate taxes than others?** If so, which types of firms benefit from a reduced tax burden, and how do they achieve this reduction? Are differences in tax rates due to the design of the tax system, to strategic tax planning or to differential enforcement? These questions matter for tax design and are difficult to answer in an empirically founded and comprehensive manner. We use administrative tax data in many countries to systematically calculate firm-level effective tax rates (ETRs) and study how ETRs vary across the firm size distribution. This note shows the results for the Dominican Republic, where the corporate statutory tax rate is 27% in 2015. We find that the ETR averages 16% across all firms, increases over the firm-size distribution, and decreases at the top for the largest firms.

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# 1 Introduction

**The effective tax rate (ETR) summarizes the tax burden faced by firms.** Two effective tax rate concepts exist for corporate taxes: forward-looking ETRs, which measure the tax burden of a hypothetical investment project over its lifetime, and backward-looking ETRs, which are based on taxes paid on realized sales and profits. Our study focuses on backward looking ETRs built ex-post from micro tax return data. Depending on the exact ETR definition (more details below), it captures a combination of the effect of statutory tax provisions (e.g. statutory tax rates and tax base definitions), differences in enforcement (e.g. size-dependent enforcement [Basri et al. 2019](#)), and firms' responses to the tax system (e.g. tax planning via deductions and exemptions [Siegfried 1974](#), [Tørsløv et al. 2020](#)). While the statutory corporate tax rate is often the same for all firms, the ETR can still vary substantially across firms due to these other elements.

**Differences in ETRs across firms could matter for efficiency and for equity.** From an efficiency perspective, differences in tax rates across firms lead to a misallocation of resources lowering productivity ([Diamond and Mirrlees 1971](#), [Bachas et al. 2019](#)). From an equity perspective, smaller firms are often owned by poorer entrepreneurs than larger firms ([La Porta and Shleifer, 2014](#)), and employ poorer/more informal workers ([Ulyssea, 2018](#)). Further, there is evidence that taxes on firms pass through to employees' wages ([Arulampalam et al. 2012](#), [Suárez Serrato and Zidar 2016](#), [Fuest et al. 2018](#)). Thus, if smaller firms bear a disproportionate tax liability, then taxes could exacerbate inequality.

**A handful of studies examine the relationship between ETRs and firm size, but these studies differ in their methodologies and results.** The studies differ in the data they use—financial statements, administrative tax data or survey data—and the definition of the ETR.<sup>2</sup> Results are thus hard to compare, and unsurprisingly the literature has not produced consistent evidence on the ETR-firm-size relation.

**We use firm-level administrative tax returns and a transparent methodology which can be applied across countries, to estimate the ETR and describe the ETR-firm-size relation.** We also correlate the ETR with firm characteristics such as sector of activity, location, ownership status and firm age. Administrative tax records are an attractive data source to construct ETRs since they cover all formal firms in a country, and contain precise information on firms' tax liability.<sup>3</sup> In contrast, financial statements, which

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<sup>2</sup>For example in Uganda, [Gauthier and Reinikka \(2006\)](#) argue that most of the tax burden is borne by mid-size firms, whereas large firms benefit from tax exemptions and smaller firms evade taxes. Other studies find that the ETR increases with firm size ([Zimmerman 1983](#)), decreases with firm size ([Nicodème 2002](#), [Richardson and Lanis 2007](#)), is U-shaped ETR in firm size ([Halleux and Valenduc 2007](#), [Mascagni and Mengistu 2019](#)), or that there is no systematic relation between ETRs and firm size ([Lazăr 2016](#)).

<sup>3</sup>Of course tax data are self-reported by firms and subject to evasion and underestimation. Depending on the type of misreporting, ETR estimates from tax data could be lower or upper bounds on the true ETR. If misreporting is firm-size or industry-specific, this type of measurement error could bias the analysis of the ETR-firm-size relationship.

have often been used in the past, only feature accounting measures of taxable profits, and hence represent an approximation of the true tax-relevant variables. Besides, in low and middle-income countries, financial statements are only available for very large, listed companies.

**This note presents the methodology and results on the ETR and the ETR-firm-size relationship for the Dominican Republic.** Anonymized firm-level corporate tax records for the Dominican Republic are provided by the Tax Administration. The data contains all corporate tax records for the years 2006-2015. It includes the main variables used to construct ETRs, and it features a breakdown of firms' costs into different cost elements. Information on firm characteristics such as sector is available, however we do not have information on ownership, firm's age or location. We use these data in other countries when it is available.

## 2 Methodology

**We define a firm's effective tax rate as the corporate income tax liability divided by economic profit.** While the choice of the numerator is straightforward, the choice of the denominator is debated in the literature. Our objective is to measure firms' profitability without the influence of exemptions and non-standard deductions that lower firms' taxable profits via tax planning activities. The relevant concepts are represented in Figure 3 in the appendix. Using total sales/turnover as the denominator is the simplest option, but is problematic, as any comparison implicitly assumes that all firms have the same true profitability. Using the net tax base as the denominator would mechanically yield an ETR that equals the statutory tax rate, since all exemptions lowering a firm's tax base are already accounted for. There is thus a trade-off between choosing a concept that approaches a firm's true profitability, and taking into account tax expenditures.

**Economic profit (i.e. net profit) is defined as total income minus all standard deductions: material, labor, operational costs, depreciation and financial costs.** The measure is related to financial-statement-based measures of ETRs, which use Earnings Before Interest and Taxes (EBIT) or Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) as the denominator. But unlike these financial-statement-based measures, we allow depreciation, interest and financial expenses to be deducted when calculating net profit. Studies based on tax data often use gross profit, defined as turnover minus the cost of goods sold. The cost of goods sold includes only direct inputs and production costs, but does not include wages, management and overhead. In countries where the breakdown of costs into its components is available, we compare our ETR measure based on net profit to alternative measures (see Appendix Figure 4). We also look at the link between ETR and sector, and find no relationship (see Appendix Figure 5).

**This ETR measure is transparent and comparable across countries.** The construction of the mea-

sure does not depend on country-specific rules about exemptions and deductions. By using net profit as a denominator, we are confident that all economic costs have been deducted, but adjustments to taxable profit are yet to be made: re-integration of non deductible expenses, deductions of exempt incomes, applications of capital allowances and investment incentives exemptions, and finally carried over losses from previous periods. We can thus observe differences in effective taxation due to tax expenditures.

**Our study is also complementary to an analysis on effective tax rates led by the Dominican Republic Ministry of Finance.**<sup>4</sup> While we use net profit for the construction of the ETR, this work uses gross profit as denominator. This implies two main distinctions when comparing the results. First in terms of levels, using gross income will mechanically produce ETRs that are lower, since the income base is wider. Second, the relationship between the ETR and the firm-size distribution may change as well. As mentioned above, an ETR constructed with gross income can take into account firms' potential tax planning activities.

### **3 Empirical Evidence on the ETR-Firm-Size Relationship in the Dominican Republic**

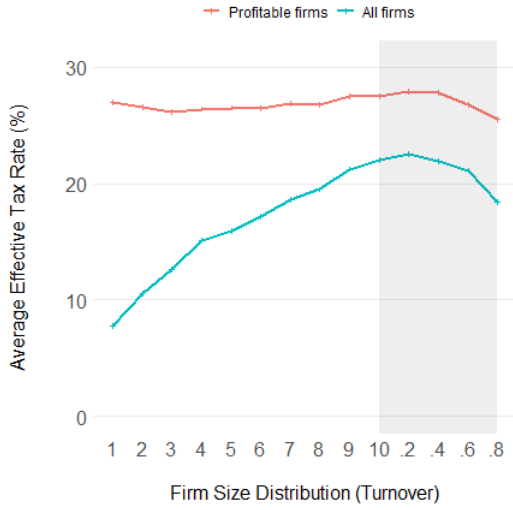
**The Dominican Republic's statutory corporate tax rate is 27% for all firms, in 2015.** Over the span of our panel, the statutory rate has changed several times: 28% in 2014, 29% from 2011 to 2013, 25% from 2007 to 2010, and 30% in 2006. We find that the average effective tax rate is 16.0% in 2015, for the whole sample. Most of the gap between the rates can be explained by loss-making firms within the distribution that face a negative or zero liability for the period, and hence an ETR of zero. For profitable firms only, the average reaches 26.8%. The remaining of the gap can be explained by the different tax exemptions.

**We find that the ETR increases with firm-size over most of the distribution (Figure 1).** Figure 1a plots the average ETR by quantiles of firm turnover, and shows that firms in the first decile face an ETR that is 12 percentage points lower than firms in the top decile. These differences in ETRs are mostly driven by differences in the number of loss-making firms within the different deciles. When we restrict the sample to profitable firms (red lines)—around 65% of the sample—the slope flattens, suggesting that loss-making firms explain a large part of the relationship between ETR and firm-size. This is similar in other countries, where the ETR retains a slope in turnover for the sub-sample of profitable firms.

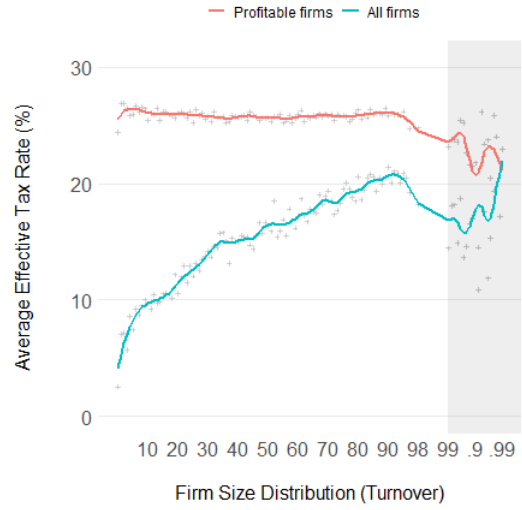
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<sup>4</sup>See [Dirección General de Impuestos Internos, RNC n.4-01-50625-4, "Año de la Superación del Analfabetismo"](#). Table A in the annex presents the ETR by sector of activities.

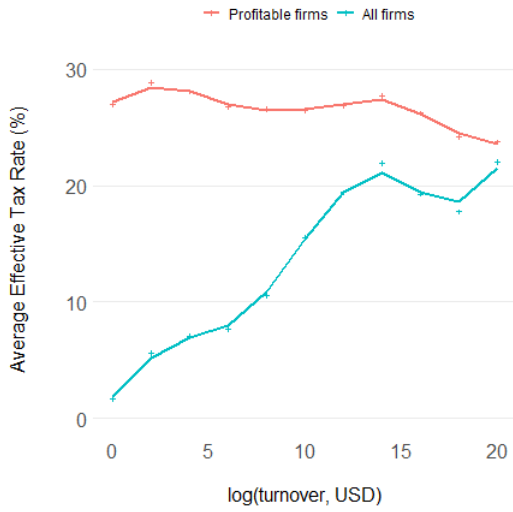
Figure 1: Average Effective Tax Rate



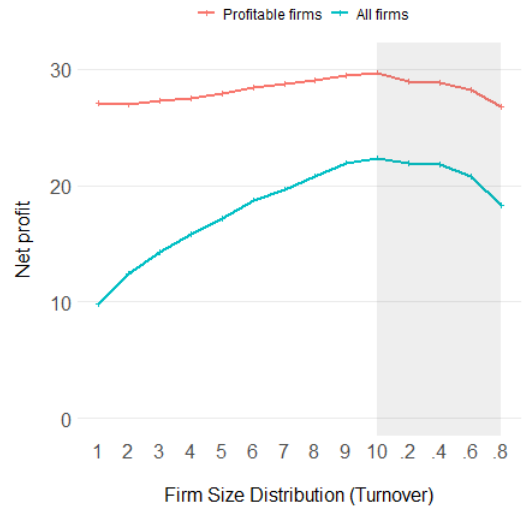
(a) By Deciles of Turnover



(b) By Percentiles of Turnover



(c) By Log Turnover



(d) By Deciles, Averages 2006-2015

Panel (a) and (b) show the average ETR (CIT liability/Net profit) by (a) deciles and (b) percentile of turnover for the last available cross-section (2015). Decile 10 in (a) is split in 5 or in quantiles 99.9 and 99.99 in (b), and represented in the grey area. Panel (c) shows the average ETR by equally-sized bins of log turnover (in USD) for 2015. Panel (d) shows the average ETR by deciles of turnover for the last year of the panel (2006-2015). In (b), the ETR is built at the firm level as the ratio of Total CIT liability over Total profit, where the totals are the sums across the years. The blue line includes all firms and negative ETRs are set to zero. The red line includes only profitable firms.

**Given the contribution of the largest firms to total revenue collection, we are also interested in**

**the ETR at the very top of the firm-size distribution.** From Figure 1a, we see that the ETR decreases at the top—whether we include loss-making firms or not. To confirm this pattern, Figure 1b presents the distribution in percentiles, and further decomposes the top 1% in the top 0.1 and 0.01%. The ETR slope is decreasing from the 98th percentile, meaning that the largest firms face a lower tax burden. A firm at the top 0.1% of the turnover distribution faces an ETR that is almost 5 percentage points lower than a firm at the top 1%.

**Alternative measures of the firm-size distribution yield a similar message.** Figure 1c plots the ETR by equally-spaced intervals of log turnover and shows a very similar pattern than figure 1b: the ETR is increasing in log(turnover) and decreasing at the top of the distribution. Finally, the results are consistent when the firm’s ETR is built with total liability and total net profit across years (2006-2015).

Figure 2: **International Comparison**

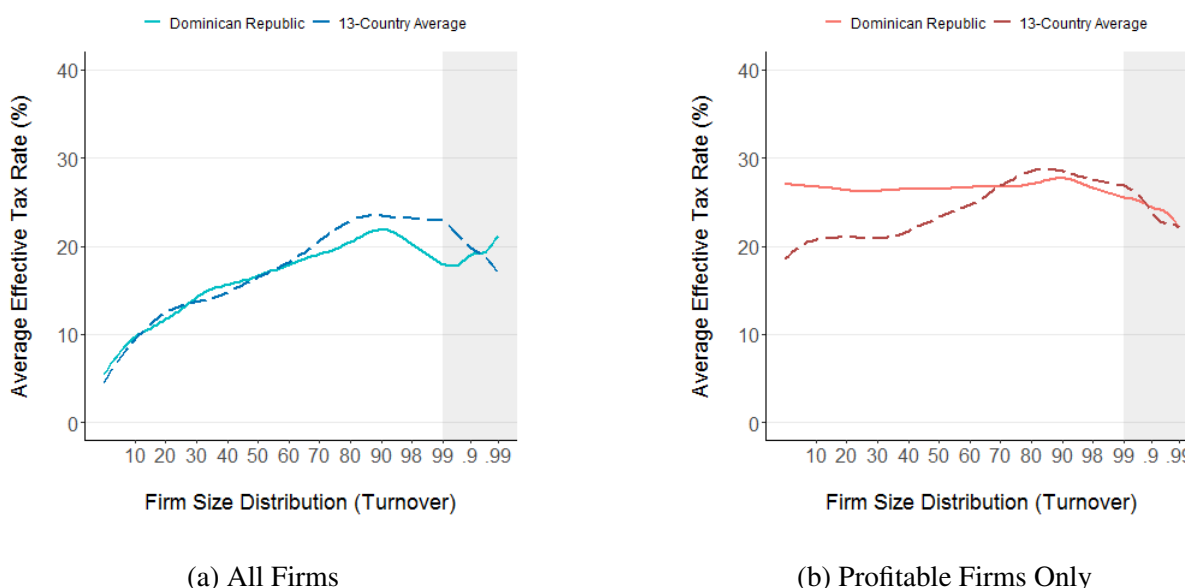


Figure 2 shows the average ETR (CIT liability/Net profit) by percentile of turnover for the last year for the Dominican Republic (solid line), and for our international sample of countries (dashed line). Our sample includes 13 countries: 5 countries in Africa, 6 in Latin America and 2 in the Balkans. Panel (a) includes all firms and negative ETRs are set to zero, and Panel (b) includes only profitable firms.

**The Dominican Republic’s ETR by firm size resembles that of the 13 other countries for which such data is available.** Figure 2 shows the ETR distribution by percentile of turnover for the Dominican Republic vs other countries. The patterns of ETR by firm size are very similar between the two samples: the ETR is increasing across most of the distribution, and decreases for the largest firms (figure 2a). Both in the Dominican Republic and in the 13-country average, the increasing slope is progressive and sustained

up to the 90th percentile. Regarding the drop in ETR at the top, this concerns the large firms from the 90th percentile to the 99th percentile for the Dominican Republic, while it happens later in the average country and for the very large firms only (figure 2a). When we account for loss-making firms (figure 2b), the average slope is reduced in the 13-countries average and almost disappears in the Dominican Republic. The results at the top remain fairly similar for the 13 countries average, while the decreasing slope at the top is now continuing to the very top of the distribution for the Dominican Republic.

## 4 Appendix

Figure 3: Concepts and Variables

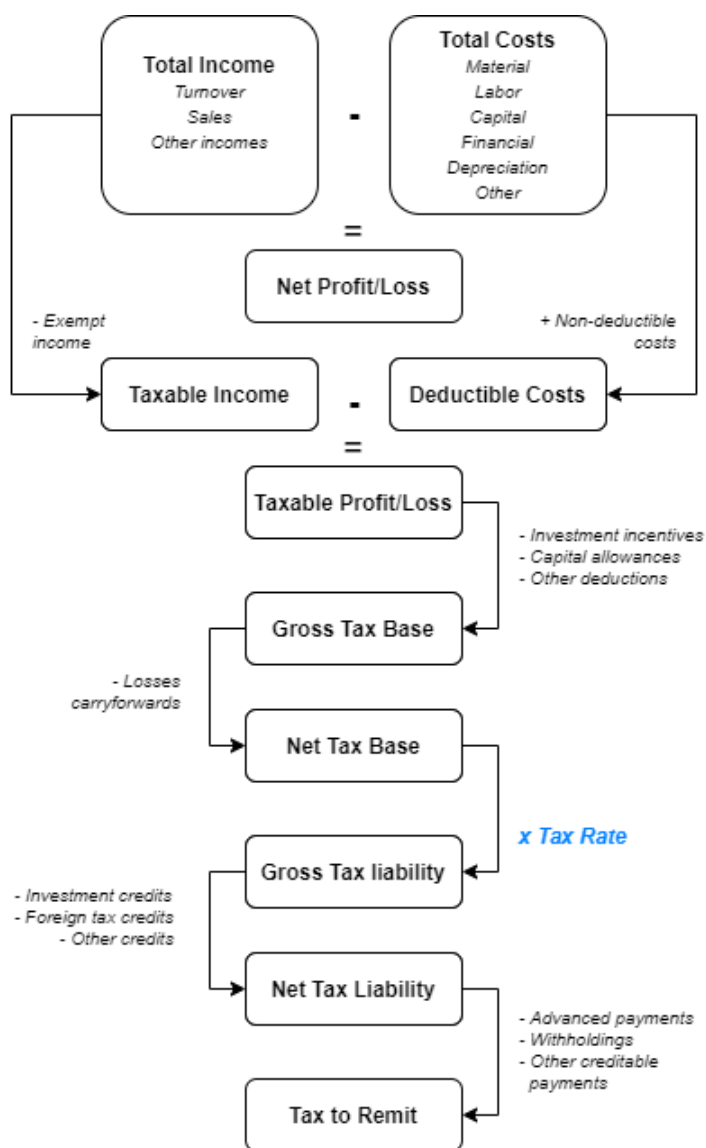
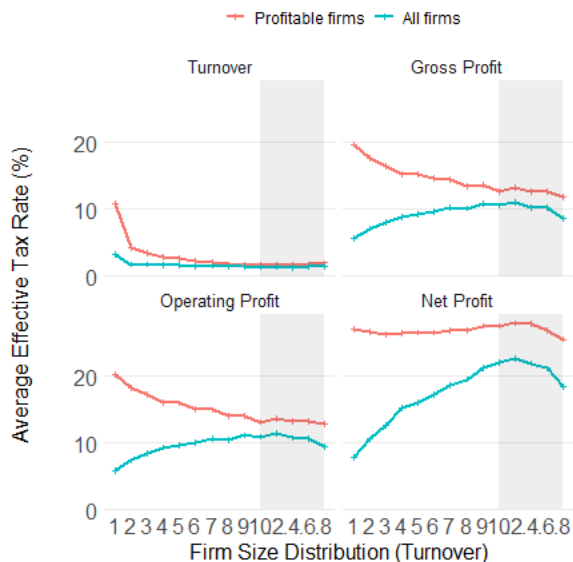




Figure 4: Average Effective Tax Rate with Different Profit Metrics



These graphs show the average for different ETR measures: CIT liability divided by Turnover, Gross Profit, Operating Profit and Net Profit, for each decile of turnover for the last year of the panel (2015). Everything else is as in Figure 1.

Figure 5: Average Effective Tax Rate By Sectors



These graphs show the average ETR (CIT liability/Net Profit), by large categories of sectors: Primary activities (Agriculture and Mining), Secondary activities (Manufacturing, Electricity & Water supply, Construction), Services (Transport, Food and Accommodation, Health, Entertainment, Administration, Real Estate, Wholesale and Other services), Information activities (Financial activities, Information and Communication, Scientific activities and Education), and Other activities; for the last year of the panel (2015). Everything else is as in Figure 1.

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