Corporate Taxation and Evasion Responses: Evidence from a Minimum Tax in Honduras

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Abstract

We study corporate responses to a minimum income tax, using the universe of corporate tax filings in Honduras. The policy design allows us to separately estimate cost misreporting under profit taxation and the elasticity of reported revenue. Large corporations overreport true costs when taxed on profits. Taxing revenue leads to a substantial decrease in reported revenues: we estimate an elasticity in the range 0.35-1. The elasticity of revenue is attenuated when third-party information on the revenue of firms is available, suggesting misreporting plays an important role. Our results inform trade-offs when broadening tax bases to curb evasion.

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The landscape of corporate taxation has changed significantly in the last few decades. Average statutory corporate tax rates have fallen from over 40% in the 1990s to 30% in low-income countries, and by even more in middle- and high-income countries (International Monetary Fund 2019b). At the same time, technological changes such as the rise of digital companies and the emergence of tax havens mean that governments face increasing challenges to assure compliance in corporate tax payments (Zucman 2014). These trends pose particularly stark threats to the tax base in lower-income countries, which often do not have the institutional capacity to fight tax evasion.

One tool deployed by several governments to assure tax payments by corporations is minimum taxes. While corporate taxes are usually assessed on declared profits, minimum taxes are assessed on a broader base (possibly gross revenue) when reported profits are very low. The International Monetary Fund (IMF) recommends the use of minimum taxes as part of "simple measures protecting against base erosion" (International Monetary Fund 2019a). Some form of minimum taxation on corporations is also at the core of recent international tax cooperation initiatives, such as the G20/OECD Inclusive Framework on Base Erosion and Profit Shifting (BEPS).

In this paper we study corporate responses to the introduction of a minimum tax in Honduras between 2014-2017. Despite the prominence of minimum taxes in economic debates, evidence is scarce on their impact on the behavior of firms (Best, Brockmeyer, Kleven, Spinnewijn, and Waseem 2015; Mosberger 2016; Alejos 2018).

Before the introduction of the minimum tax, corporations in Honduras faced a flat 25% tax on reported profits, defined as gross revenues minus total claimed deductions. Starting in FY2014, the country introduced a minimum tax provision mandating that taxpayers declaring yearly gross revenue above L10 million (approximately USD 400,000) pay the maximum between their liability under profit taxation and 1.5% of declared gross revenue. The policy effectively introduced a floor on the effective tax rate paid by large corporations, even when reported profits were low. It was also important from a tax collection perspective, representing approximately 20% of total corporate income tax in the period.

Using the universe of corporate tax declarations between 2011 and 2018, we start by documenting that taxpayers responded strongly to the incentives created by the minimum tax. Since firms reporting gross revenue below L10 million are exempt from the minimum tax, its introduction created a *notch*: a threshold where tax liability might change discontinuously in response to small changes in declared revenue. As an illustration, a firm declaring L9.99 million in gross revenue and close to zero profits will pay virtually no taxes, but declaring L10 million would create a tax liability of L150,000 (1.5%*L10 million) under the minimum tax. This notch generates strong incentives for firms to strategically locate below the exemption threshold. We show that the distribution of firms declaring gross revenue in the vicinity of the exemption threshold was smooth between 2011 and 2013, but presents a clear and increasing excess mass immediately below the threshold when the minimum tax went into effect in 2014. When the exemption threshold was increased to L300 million in 2018, the excess mass around the previous notch immediately disappeared.

We use tools from the bunching literature (Kleven and Waseem 2013; Kleven 2016), adapted to our context, to recover bounds on the elasticity of reported revenue with respect to one-minus the tax rate - a key behavioral parameter to assess the response of firms to a policy taxing revenues. Our estimates suggest that the marginal buncher reduces their reported revenue by 15-30% to avoid being subject to the minimum tax and facing higher tax liability. We estimate revenue elasticities in the range of [0.35,1], considerably higher than previous estimates for similar contexts – Bachas and Soto (2021), for example, estimate elasticities of reported revenue in the range [0.08 - 0.33] for corporations in Costa Rica.

The large estimated elasticity emphasizes the limits faced by the tax authority in broadening the tax base: increasing tax rates will lead to a substantially smaller tax base. While the revenue response could be entirely driven by real production decisions (firms decreasing sales in order to be exempt) we offer evidence that misreporting revenue is part of the explanation. We construct firm-level measures of revenue observability, which we define as the share of self-declared revenue that is independently observed by the tax authority through third-party reporting. We show that taxpayers are more likely to locate immediately below the exemption threshold when the tax authority has limited ability to independently assess declared revenue: the excess mass below the exemption threshold is 65% larger for firms with below median revenue observability. We also explore different levels of revenue observability across industries and document the same pattern of behavior: firms in high-observability industries are much less likely to bunch below the threshold, implying a lower elasticity of reported revenues. Taken together, we interpret these as evidence that at least part of the observed response of declaring revenue below the exemption threshold is explained by misreporting and thus potentially responsive to the enforcement environment.

While firms that would have declared gross revenue slightly above the exemption threshold might report lower revenue to escape the minimum tax, larger firms will not be exempt. We document that taxpayers with revenues significantly above the threshold reduce their reported costs and increase their reported profit margins, consistent with the fact that under revenue taxation firms cannot decrease their tax liability by inflating costs. We interpret this as clear evidence of evasion under the profit taxation regime. In order to quantify these evasion responses, we explore the fact that a minimum tax creates a *kink* in the tax schedule faced by taxpayers (Best et al. 2015): both the tax rate and the tax base change discontinuously at the profit margin level that separates the two regimes, while the tax liability changes continuously.

We show that corporations increased their reported profit margin by 0.9 - 1.1 percentage points when incentives to over report deductions disappeared. Decomposing the profit margin change between real production and misreporting components, we estimate that under profit taxation corporations increase their reported costs by 13 - 17% of their profits in order to reduce their tax liability.

We also explore the rich administrative data to show that not all deduction categories respond in the same manner. We document that firms systematically over-report hard-to-trace deductions, like costs linked to the purchase of goods and materials, when taxed on profits. No over-reporting is observed in categories that generate a paper trail that is easier to verify, like labor or financial costs. This is similar to findings from Mosberger (2016) in Hungary and strongly suggests a focus for tax authorities' efforts in assessing the veracity of claimed deductions under profit taxation.

To quantify the impacts of the minimum tax on government revenue collection and profit of firms, as well as compare these with alternative tax policies, we impose more structure on the profit maximization problem of firms and calibrate a model using behavioral parameters estimated above. We present two exercises. First, under our parametric assumptions, we quantify the impact of the specific minimum tax policy introduced in Honduras, considering that previously firms were taxed on profits. We estimate that the reform increased tax revenues by up to 30%, but at the cost of reducing aggregate corporate profits by 10% due to larger tax liability and production distortions. Second, we consider a potentially simpler policy change to increase tax revenue from large taxpayers: an increase in the *average* profit tax rate faced by corporations declaring gross revenue above L10 million. We show that to collect the same amount of revenue as in the minimum tax regime would require an average tax rate of 40%, 15 p.p. higher than the tax rate below the threshold. While production is not distorted under the increased profit tax rate, aggregate profits fall by 20% in this scenario driven by increased evasion related losses.

Two caveats about our results should be taken into account. First, we do not attempt to estimate who bears the incidence of corporate taxes (Auerbach 2005; Bastani and Waldenström 2020). While the classic result of Harberger (1962) is that capital owners economy-wide bear the full incidence of corporate taxation in a closed economy, recent empirical evidence suggests that a substantial share of the tax burden is also borne by workers (Suárez Serrato and Zidar 2016; Fuest, Peichl, and Siegloch 2018). For those reasons we also do not discuss any possible redistribution motives from the minimum tax reform, since such exercises would require attributing incidence. Second, our model of firm optimization and our simulations do not consider general equilibrium effects of a broader tax base. Limiting cost deduction not only distorts firm size directly, but also cascades down production networks, distorts input prices and the size of downstream firms, and can lead to firm exit. Best et al. (2015) develop a general equilibrium model and show that introducing some degree of production inefficiency is still optimal when enforcement is imperfect.

The first contribution of this paper is to provide new evidence on corporate minimum taxes, a widely-used policy tool to ensure corporations contribute to tax revenue mobilization. We complement previous findings about minimum taxes in Pakistan (Best et al. 2015), Hungary (Mosberger 2016) and Guatemala (Alejos 2018). One crucial advantage of our setting in Honduras is that the specific design of the minimum tax allows us to estimate the elasticity of reported revenue for corporations, a key behavioral parameter to understand the impact of revenue-based taxes.

Second, our work provides a detailed anatomy of the nature of tax evasion among medium and large corporations in low- and middle-income countries. We contribute to a small but growing literature using tax administrative records to gain insights on mechanisms behind evasion by corporations (Bustos et al. 2022; Carrillo et al. 2022; Waseem 2020; Mittal, Reich, and Mahajan 2018; Almunia and Lopez-Rodriguez 2018). Our paper shows that the availability of third-party information reduces the elasticity of reported revenue and that cost misreporting is concentrated in categories that are hard to verify such as the costs of goods and materials[1]. These findings provide a more nuanced understanding of the nature of tax non-compliance and reinforce the idea that evasion responses are not fundamental primitives that govern the behavior of firms, but are to some degree sensitive to the enforcement context (Fack and Landais 2016; Slemrod and Kopczuk 2002; Basri et al. 2019).

[1]In the context of personal income taxes, Londoño-Vélez and Ávila-Mahecha (2019) document substantial evasion of a wealth tax in Colombia, highlighting the use of offshore accounts and of harder-to-observe wealth components as a relevant mechanism.

Finally, we contribute to the growing literature on bunching methodologies that use discontinuities in the tax design to identify structural parameters (see Kleven (2016) for a recent review). While there exists extensive research on how individuals react to discontinuities in the tax schedule (Saez 2010; Bastani and Selin 2014; Kleven and Waseem 2013), we contribute to the more limited literature on how corporations respond to these incentives, similarly to the work of Bachas and Soto (2021) in Costa Rica and Devereux, Liu, and Loretz (2014) in the United Kingdom.

I Institutional Context and Data

We study a reform that introduced a minimum tax on corporations in Honduras, a lower middle-income country in Central America with a population of 9 million and per capita GDP of $5,800 PPP in 2018. The level and composition of government tax revenues in Honduras is comparable to other countries with similar per capita income. First, total tax revenues represent around 18% of GDP, significantly below the average of 25% observed in high-income OECD countries. Second, the country is much more reliant on goods and services taxes, representing over 50% of total tax revenue, than on income taxes, which amount to one-third of total tax revenue. Finally, corporate income taxes are equivalent to 4% of GDP, almost twice as much as personal income taxes (International Monetary Fund 2018). These last two facts are broadly consistent with the perception that lower-income countries face significant informational constraints in assessing more complex tax liabilities and therefore rely more on broader sales taxes and/or taxing large corporations (Gordon and Li 2009)[2].

Corporations face a 25% flat tax rate on taxable income, defined as gross revenues minus standard deductions such as wages, raw materials, depreciation of capital, interests paid and carryover losses. Fiscal years in Honduras run according to the calendar year and taxpayers must file the income tax declaration by April 30th.

The minimum tax studied in this paper was introduced in 2014 as part of a broader tax reform that also increased VAT rates from 12% to 15%. The two main features of the minimum tax are as follows. First, it exempts taxpayers reporting gross revenue below L10 million[3], which are still liable for a 25% rate on declared taxable income. Second, taxpayers reporting gross revenue above L10 million are

[2]Figure A1 illustrates how Honduras compares to other countries in terms of overall and corporate income tax collection.

[3]Approximately USD 400,000 using the average market exchange rate in 2018 (USD 1 = L24.5).

liable for a minimum of 1.5% of their reported revenue. When filing the yearly income tax declaration, corporations must compute their tax liability under the usual profit regime and the 1.5% regime, and are liable for the larger of the two. Since profits are taxed at 25%, a taxpayer declaring 6% profit margin (reported profits divided by gross revenue) will face a tax liability equivalent to 25%*6% = 1.5% of gross revenues and will be located exactly at the edge between the two regimes.

The immediate objective of the minimum tax was to create a floor to the effective tax rate (tax liability divided by gross revenue) faced by large taxpayers: regardless of declared profits, corporations with revenue above L10 million should pay no less than 1.5% of their declared gross revenues in taxes. In Figure 1, panel A, we present evidence that the policy substantially raised the effective rate faced by large corporations.

In the period 2011-2013, before the minimum tax was in place, the median effective rate faced by firms with gross revenue around L10 million was approximately 0.5%. Between 2014 and 2017, when the minimum tax is in place for firms declaring revenue above L10 million, the median effective rate substantially changes around the threshold. Firms declaring gross revenues below that level still face an effective rate close to 0.5%. Corporations with revenue above L10 million, however, are now subject to the minimum tax and the median firm faces an effective rate of exactly 1.5%[4]. The figure also illustrates the *notch* generated by the minimum tax: by declaring gross revenue marginally above L10 million firms face a discontinuous increase in their tax liability. While in panel A we focus on corporations around the exemption threshold, in panel B we document that the policy was effective in increasing the median effective rate for all firms declaring gross revenue well above the threshold.

The increase in effective tax rate for firms above the exemption threshold is driven by firms that declare low profit margins but no longer pay very small tax liabilities. We illustrate that fact in Figure 2, where we plot effective tax rates for firms declaring different profit margins. In the period 2011-2013, before the introduction of the minimum tax, the relationship between declared profit margin and tax liability is approximately linear for all profit margin levels. With the introduction of the minimum tax, the relationship between profitability and tax liability changes for firms with profit margins below 6%. They now face a minimum tax liability equivalent to 1.5% of their gross revenue and the incentive to declare lower profits in order to reduce their tax liability disappears. The figure also illustrates

[4] Figure A2 shows a similar pattern when plotting the average instead of median effective rate.

that the policy introduces a *kink* in the budget set of taxpayers exactly at the 6% threshold, with a change in the slope of the tax schedule.

Three special provisions of the minimum tax law are worth discussing in more detail. First, taxpayers in certain sectors (cement, state enterprises, pharmaceuticals and bakery) face a 0.75% rate instead of 1.5%. Firms in those sectors are less than 2% of taxpayers, so we exclude them from our main analysis and present separate results showing that their behavior is also consistent with predictions from theory. Second, we also exclude from our main analyses firms operating in petroleum-related sectors and those in their first two years of operations, which are exempt from the minimum tax[5]. Finally, firms declaring losses are also exempt from the minimum tax. This feature is potentially relevant to our empirical exercises, since that might create strong incentives for low profit firms to report negative taxable income. In practice this behavior seems to be limited in the data. We discuss the likely reasons for that in section IV.

Despite being part of a larger tax reform, the minimum tax provision was highly salient and widely debated in the public sphere. A previous attempt to institute a 1% minimum tax in 2011 was ruled unconstitutional by the Supreme Court and never went into effect. The 2014 reform was again challenged in the courts but eventually upheld as constitutional in 2015, and stayed in place until FY2017. In the aftermath of highly contested elections in that year, the government approved a series of policy reforms "conced[ing] to long-standing demands from interest groups" (International Monetary Fund 2018), including the gradual phasing out of the minimum tax provision. For FY2018, the exemption threshold was raised from L10 million to L300 million. While approximately 20% of corporations declared gross revenue above L10 million before the introduction of the minimum tax, only 1.3% declared revenues above L300 million in 2017. The law additionally established further increases in the exemption threshold to L600 million in FY2019 and L1 billion in FY2020, meaning that very few corporations would be affected by the minimum tax at the end of the period.

a Data and descriptive statistics

The main analyses in this paper are based on administrative data comprising the universe of income tax declarations from corporations in the 2011-2018 period (SAR 2020). We supplement this data, in additional exercises, with monthly VAT dec-

[5]Both exemptions in the first years of operation and lower rate for sectors such as pharmaceuticals are common features of minimum tax regimes across the world. We provide a summary of minimum tax provisions in several countries in Online Appendix G.

larations and third-party information on taxpayers' transactions. Throughout the paper, we exclude taxpayers in special regimes that exonerate them from paying any income taxes – they represent less than 5% of all corporations. The resulting dataset is an unbalanced panel of over 180,000 firm-year observations and approximately 41,000 unique firms.

We present basic descriptive statistics of our sample in Table 1 for years 2013-2018, highlighting the following facts. First, the number of corporations filing income tax has steadily increased throughout the period, from less than 20,000 in 2013 to approximately 30,000 in 2018. While in our main estimates we use an unbalanced panel of taxpayers, we show that firms' responses to the minimum tax are qualitatively similar in a balanced panel of corporations that file every year. Second, average reported gross revenue was around L30 million (USD 1.2 million) but with wide dispersion: the median corporation in the sample had yearly gross revenues of L1.2 million (USD 48,000) and over 80% reported revenues below L10 million. Third, average pre-tax profit margins steadily increase throughout the period, from less than 2% in 2013 to almost 5% in 2018. As discussed below, part of this increase is likely explained by the introduction of the minimum tax, which induced a decrease in claimed deductions and consequent increase in reported profits for large corporations. Despite that, average profit margins are always well below 6%, meaning that the average tax liability under profit taxation is less than 1.5% of gross revenues. Fourth, even though the minimum tax is not directly aimed at multinational corporations (MNC) operating in the country, these are disproportionately large and thus potentially affected by the policy: even though MNCs represent only 2-4% of corporate filers, they pay approximately 60% of taxes[6]. Finally, even though only a small fraction of firms end up liable for minimum taxes (between 6-8% in 2014-2017), they contribute 20-30% of total corporate tax revenues. Indeed, despite the number of firms liable for minimum taxes falling by an order of magnitude in 2018, when the exemption threshold increased, their contribution to total corporate tax revenues was still close to 15%[7].

In order to illustrate the relevance of the largest corporations to tax collection,

[6]Multinational corporations are defined as firms filing transfer price declarations at some point in the period 2014-2017. The potential for the minimum tax to increase tax collection from MNCs depend not only on their gross revenues but also on their profit margin in the absence of minimum taxation. In Figure A3 we show that large MNCs declare higher profit margins than domestic firms in 2013, but still only 30% declare margins above 6%, implying an effective tax rate above 1.5%. In Online Appendix H, we investigate whether MNEs have reacted to the minimum tax policy by changing their use of transfer pricing activities. Given data limitations and the small number of MNEs, our estimates are very noisy and we cannot precisely assess those impacts.

[7]In Figure A4 we show that corporate tax liabilities substantially increase from approximately L10 million in 2013 to almost L14 million in the year after the introduction of the minimum tax.

we present in Table 2 the share of total revenue and taxes declared by the largest taxpayers. In 2013, before the introduction of the minimum tax provision, the largest twenty corporations in terms of gross declared revenue (top 0.1%) declared almost 30% of total revenues and accounted for 32% of total corporate taxes. Almost 70% of taxes were generated by the top 1% corporations and the top 10% (approximately 2,000 firms) paid more than 90% of taxes[8]. This skewness in the distribution of firm size highlights the potential of the minimum tax to significantly increase revenue collection despite exempting approximately 80% of firms.

II Conceptual framework

a Model of firm optimization

In this section we present a stylized model of profit maximization by firms in line with the classical approach of Allingham and Sandmo (1972) and adapted by Best et al. (2015) to illustrate the incentives introduced by a minimum tax and motivate the empirical exercises that follow. Firms choose a production level y and the level of costs $\hat{c}$ reported to the tax authority, which might be higher than true costs of production given by an increasing and convex function $c(y)$. We assume output prices are fixed and equal to p = 1, so we can express revenue equal to production. Firms face an increasing and convex loss in the amount of cost misreported given by $g\Big(\hat{c} - c(y)\Big)$, with $g(0) = 0$[9]. Since a regime with a minimum tax allows for both profit and revenue taxation, we model the possibility that only a share $\mu \in [0, 1]$ of costs can be deducted to obtain the taxable income, taxed at rate τ. Firms then choose the vector $(\hat{c}, y)$ to maximize after-tax profits:

$$\underset{(\hat{c},y)}{Max} \quad \Pi(\hat{c}, y) = y - c(y) - \tau\Big(y - \mu\hat{c}\Big) - g\Big(\hat{c} - c(y)\Big) \tag{1}$$

[8] This is similar to what Devereux, Liu, and Loretz (2014) report for corporations in the United Kingdom (top 1% account for 80% of corporate income taxes) and Almunia and Lopez-Rodriguez (2018) report for Spain (top 2% report 80% taxable profits.). In the United States, Auerbach (2005) mentions that the largest 0.04% corporations in terms of assets account for 62% of all corporate income tax in 2001. In a more similar context, Bachas and Soto (2021) document that the largest 20% corporations account for 87% of corporate taxes, which is a substantially smaller share than in Honduras.

[9] In our stylized model we consider that firms can only misreport costs and not revenues. This is a simplifying assumption we make to illustrate the idea that it is easier to misreport costs than revenue.

Under a linear tax schedule, first-order conditions are:

$$g'\Big(\hat{c} - c(y)\Big) = \tau\mu \tag{2}$$

$$c'(y) = \frac{1-\tau}{1-\tau\mu} = 1 - \tau\frac{1-\mu}{1-\tau\mu} = 1 - \tau_E \tag{3}$$

When choosing how much costs/deductions to report, firms equalize the marginal cost of misreporting deductions to the marginal benefit $\tau\mu$ (not paying tax rate τ on share μ of marginal reported cost). Similarly, the level of production is obtained by equalizing the marginal benefit of producing one extra unit of output $1-\tau$ to the marginal cost $c'(y)(1-\tau\mu)$, which depends on how much of costs can be deducted to obtain taxable income. We re-write Equation 3 so that firms equalize the marginal cost of production to $1-\tau_E$, the net-of-tax benefit of marginally increasing production.

Under a pure profit taxation regime, when all production costs can be deducted ($\mu = 1$), we have that $\tau_E = 0$ and $c'(y^*) = 1$: taxes on pure profits are non-distortionary and firms choose the efficient level of production. In the other extreme, when $\mu = 0$ firms pay taxes on their gross revenue and $\tau_E = \tau$ and $c'(y_r) = 1-\tau \implies y_r \leq y^*$. That is, firms are sub-optimally small since the marginal benefit of an extra unit of revenue is $1-\tau$. For any interior value of $\mu \in (0,1)$, production levels will be below optimal.

While taxing a broader base than profits induces distortions in production levels, the opposite is true for evasion levels: under revenue taxation Equation 2 becomes $g'\Big(\hat{c} - c(y)\Big) = 0$ and then $\hat{c} = c(y)$. When costs are not deductible, firms have no incentive to misreport and so report truthfully. Increases in costs deductibility μ induce firms to increase their reported costs in order to reduce tax liability, but also produce misreporting losses[10].

b Incentives under the minimum tax

Informed by the model, we now discuss the change in incentives faced by firms that were initially subject to a 25% flat rate on profit and face the introduction of a

[10]Importantly for welfare evaluation, we interpret these evasion losses as social losses, such as the costs of keeping parallel accounting systems or avoiding entering certain economic transactions that might reveal true costs. As discussed by Chetty (2009), implications for welfare analysis differ if evasion costs are actually seen as transfer between agents (fines paid to the government, for example) or if perceived costs are different from actual costs.

minimum tax. We can write the tax liability faced by firms as

$$T(y,\hat{c}) = \begin{cases} 0.25 * \Big(y - \hat{c}\Big), & \text{if } y < 10,000,000 \\ Max\{0.25 * \Big(y - \hat{c}\Big), 0.015 * y\}, & \text{if } y \geq 10,000,000 \end{cases} \tag{4}$$

Consider first firms with gross revenue significantly above L10 million and therefore not exempt from the minimum tax. From the expression above, the tax liability under profit and revenue taxation will be the same whenever the declared profit margin $(y - \hat{c})/y$ is equal to $0.015/0.25 = 6\%$. Corporations which in the absence of the minimum tax would have reported profit margins above 6% have no incentive to change their behavior: their liability under profit taxation is still larger than 1.5% of their revenues, so they effectively do not face a different regime. Firms which declare positive profit margins below 6%, on the other hand, now face a tax of 1.5% on their gross revenues instead of 25% on declared taxable income. According to the model discussed, this induces changes in two dimensions. First, production decisions are now distorted (since $\tau_E = 0.015$) and firms will reduce production/revenues. Under the assumption of decreasing returns to scale, that effect will lead to an increase in firms' profit margins (Best et al. 2015). Second, under revenue taxation firms will not over-report costs, since misreporting entails losses but no longer provides the benefit of reducing tax liability. Both effects will cause the pre-tax profit margin distribution to shift right. Since taxpayers reporting profit margins above 6% are not affected, only the distribution below 6% is shifted and we should observe an excess mass around that threshold.

Consider now the incentives faced by firms that, absent the minimum tax, would have declared gross revenue slightly above the L10 million exemption threshold. Just as discussed above, firms that would have declared profit margins above 6% face no change in incentives and will still choose the same revenue and declared cost levels as they would under pure profit taxation. Low-profit firms, however, now face a different decision. They might declare gross revenue above L10 million and adjust their production and evasion decisions in response to the 1.5% minimum tax liability. But they might also decide to decrease revenue to slightly below L10 million so that they are exempt from the minimum tax and pay the profit tax. Unlike notches generated by wealth (Londoño-Vélez and Ávila-Mahecha 2019) or gross income taxes (Kleven and Waseem 2013), where all taxpayers above the notch see their liability discontinuously increase, in our setting only a subset of taxpayers are affected by the notch (Bachas and Soto 2021). The benefit of declaring revenue below the exemption threshold, i.e., of bunching, is inversely proportional to the profit margin that would be declared in the absence of the minimum tax.

To see this, consider the profits of a hypothetical taxpayer that must decide between choosing a production level marginally below the exemption threshold (bunching) y^T and reporting cost $\hat{c}$, or producing y_0 above the threshold, reporting true costs $\hat{c}_0 = c(y_0)$ and paying the minimum tax:

$$\Pi(y^T, \hat{c}|Bunch) = y^T - \tau_\pi\Big(y^T - \hat{c}\Big) - c(y^T) - g\Big(\hat{c} - c(y^T)\Big) \tag{5}$$

$$\Pi(y_0, \hat{c}_0|NotBunch) = y_0 - \tau_y y_0 - c(y_0) - \underbrace{g\Big(\hat{c}_0 - c(y_0)\Big)}_{=0} \tag{6}$$

in which the term of cost misreporting will be zero since staying above the threshold means being taxed on revenue, so there is no incentive to overreport costs.

The gains from deciding to bunch can therefore be written as

$$Bunching\ Gains \approx \underbrace{(y^T - y_0)}_{\leq 0} - \underbrace{(c(y^T) - c(y_0))}_{\leq 0} - \underbrace{(\tau_\pi y^T - \tau_y y_0)}_{\geq 0} + \tau_\pi \hat{c} - g(\hat{c} - c(y)) \tag{7}$$

The expression above breaks down the change in profits when deciding to bunch. The first two terms capture the fact that, when bunching, firms will reduce real output, therefore losing revenue, but also reducing costs. The third term captures the fact that bunching means paying a much larger tax rate on gross reported revenues (25% vs. 1.5%), while the fourth term captures the main benefit of bunching: the opportunity to deduct 25% of all reported costs when being taxed on profits instead of revenue. This highlights the fact that the incentive to bunch is directly proportional to costs: for any given level of revenues, firms with higher costs have a stronger incentive to bunch since they will be able to deduct those costs from their tax base when bunching. The fifth term captures the negative effects for the firm in misreporting costs, which is increasing in the distance between true and reported costs.

After laying out the conceptual framework on firms' response to the introduction of the minimum tax, in the next section we first provide non-parametric evidence that taxpayers responded in a manner consistent with the model described above. We then proceed to explore how these behavioral responses can be used in order to recover structural parameters of interest.

III Empirical methodology and results

a Evidence of behavioral responses

We start presenting evidence that, consistent with the simple model outlined previously, taxpayers responded to the existence of the exemption threshold by reporting gross revenue immediately below L10 million. In Figure 3, we present the empirical densities of reported gross revenues separately for three periods: 2011-2013, before the introduction of the minimum tax; 2014-2017, when the policy was in place with a L10 million exemption threshold; and 2018, when the exemption threshold was increased to L300 million. In the absence of the notch created by the minimum tax, the distribution of reported revenue is smooth throughout the interval. In the period when the minimum schedule creates a notch at L10 million, corporations respond by adjusting their reported revenue to slightly below the threshold: there is a clear excess mass of firms in that region, and a more diffuse absence of mass slightly above. Consistent with the theory presented previously, there is no "hole" in the distribution immediately above the L10 million notch, since the minimum 1.5% effective rate is not binding for firms with high enough profit margin[11].

While firms immediately to the right of the notch have a strong incentive to bunch at the L10 million threshold, firms that would have reported much larger revenue are infra-marginal to this bunching behavior. The introduction of the minimum tax leads affected firms to decrease evasion through misreporting and decrease scale, increasing reported profit margins. Since only firms otherwise declaring profit margins below 6% are affected we should observe an excess mass of firms exactly at the kink. In practice we often observe a diffuse mass in the vicinity of the kink (Saez 2010). In Figure 4, Panel A, we present the empirical density of reported profit margin for firms declaring revenue above L13 million, and therefore infra-marginal to the bunching behavior at the notch, separately for 2011-2013 and 2014-2017. In the period before the introduction of the minimum tax, we observe a steep negative slope in the density of profits, smoothly distributed around the 6% kink. With the introduction of the minimum taxation in 2014, the distribution becomes starkly different as predicted by theory: there is much less mass around positive but close to zero profit margins and firms bunch around the 6% kink.

While in Panel A of Figure 4 we illustrate the change in profit margin density before and after the introduction of the minimum tax, in panel B we present

[11] As discussed by Kleven and Waseem (2013) and Gelber, Jones, and Sacks (2020), among others, some firms might not respond to the incentives to bunch due to inattention, high adjustment costs or some combination of other frictions. We discuss below how we interpret the existence of such taxpayers in our elasticity estimates.

empirical densities for the period 2014-2017, while the minimum tax was in place, separately for firms with reported revenue significantly below and above the L10 million exemption threshold. The pattern is remarkably similar to Panel A: firms declaring revenue below the exemption threshold, and therefore unaffected by the minimum tax, are much more likely to declare low profit margins, while those under the minimum tax regime declare higher profit margins and bunch at the 6% kink. We interpret these differences in reported profit margin as evidence that corporations over-report costs under profit taxation to evade taxes, and adjust their behavior when taxed on revenues.

The previous set of figures are strong evidence that the minimum tax was a highly salient policy change that induced behavioral responses from the taxpayers[12]. In the remainder of this section we explore how these responses can be used to identify parameters of interest.

b Revenue elasticity at the L10 million notch

We use tools from the bunching literature to translate the observed behavioral responses presented above into estimates of parameters underlying firms' behavior. The core insight developed by Saez (2010) is that non-linearities in the tax schedule faced by taxpayers will generate bunching, the amount of which is proportional to the elasticities governing the behavior of taxpayers. Our first step is then estimating the counterfactual distribution that would have prevailed in the absence of these discontinuities, so that we can obtain an estimate of the excess bunching and relate that to underlying behavior.

We first discuss how the bunching in response to the L10 million threshold can be used to estimate the elasticity of reported revenue. As previously shown, the exemption threshold generates a notch, where tax liability discontinuously changes for some taxpayers. According to our model, firms deciding to locate exactly at the notch come from a continuous region $[y^T, y^T + \Delta Y]$, where $y^T = L10$ million.

To recover the counterfactual gross revenue density, we fit a polynomial regression to the empirical density of revenue, including dummies for the "excluded region" - the area around the notch affected by the policy (Saez 2010; Chetty, Friedman, Olsen, and Pistaferri 2011). We then predict the counterfactual density for the entire distribution ignoring the dummies, extrapolating the polynomial prediction

[12] In Figure A5 we present jointly the change in reported revenue and profit margins using heatmaps. With the introduction of the minimum tax (Panel B), an excess mass of firms declare revenue immediately below the L10 million exemption threshold and, for larger firms, increase their reported profit margins up to 6%.

to the bunching area and assuring a smooth counterfactual distribution around the notch[13].

We first collapse the data in bins of L100,000 (USD 4,080) of revenue and estimate:

$$n_j = \sum_{k=0}^{5} \beta_k y_j^k + \sum_{b=y_L}^{y_H} \gamma_b \mathbb{1}\{y_j = b\} + \epsilon_j \tag{8}$$

where n_j is the number of observations in bin j, y_j are the revenue midpoint of bin j, $[y_L, y_H]$ is the excluded region affected by the notch and $\mathbb{1}\{y_j = b\}$ are dummies indicating that bin j belongs to the excluded region.

The predicted counterfactual density is defined as $\hat{n}_j = \sum_{k=0}^{5} \hat{\beta}_k y_j^k$. We can then obtain the excess mass of taxpayers below the threshold as the difference between the empirical and predicted densities $\hat{B} = \sum_{b=y_L}^{y_N} (n_j - \hat{n}_j)$, where y_N is the bin with upper bound equal to the notch.

The credible estimation of the counterfactual density requires the excluded region to be correctly determined - all those bins affected by the existence of the notch/kink in the tax schedule should not be used to estimate the counterfactual density. We follow the method pioneered by Kleven and Waseem (2013) when taxpayers face notches: while the lower bound of bunching is visually determined, we use the convergence method to obtain an upper bound for the affected region. We exploit the fact that, according to our model, the excess mass observed immediately below the notch ($\hat{B}$) must be equal to the missing mass above $\left(\hat{M} = \sum_{b=y_N}^{y_u} (n_j - \hat{n}_j)\right)$, so we recursively estimate Equation 8 increasing the upper bound y_H until $\hat{B} \approx \hat{M}$[14], at which point we determine that to be the upper bound.

In Figure 5 we pool all corporate filings in the 2014-2017 period and present the empirical revenue density as well as the estimated counterfactual density. We provide estimates of the total excess number of firms (B), the excess mass of firms as a share of average density in the bunching region (b), the upper bound of the bunching region estimated using the convergence method (y_u) and the number of underlying observations used in each graph (N)[15]. Our estimates indicate that the

[13]The assumption of a smooth distribution is not a trivial one, as pointed out by Blomquist and Newey (2017) and Bertanha, McCallum, and Seegert (2018). In particular, they show that kinks cannot identify the elasticity of taxable income if we allow for unrestricted heterogeneity of preferences. In our setting, we can partially alleviate concerns about the counterfactual density by showing, as we do in Figure 3, that the density was indeed smooth around the threshold before and after the existence of the notch.

[14]Since we estimate the regression using discrete bins, we determine $\hat{B} \approx \hat{M}$ to mean that $|(\hat{B} - \hat{M})/\hat{B}| \leq 0.03$.

[15]Standard errors are obtained by bootstrapping the entire estimating procedure, resampling errors from Equation 8 500 times.

excess mass below the notch is equivalent to 5.5 times the predicted counterfactual density and that the marginal buncher would have reported gross revenue of L11.8 million in the absence of the notch, effectively reducing their declared revenue by over 15% in order to avoid the minimum tax. The results for each year and for the pooled sample are presented in columns (1) - (4) of Table 3[16].

In order to recover the elasticity of reported revenue from the behavioral responses estimated above, we adapt the reduced-form approximation developed by Kleven and Waseem (2013) (we present the derivation of the formula in Online Appendix B). We can show that, for a given revenue response ΔY by the marginal buncher, the elasticity of reported revenue is given by:

$$\epsilon_{y,(1-t)} = \left(\frac{1}{\tau_y \left(2 + \frac{\Delta Y}{Y^T}\right) - 2\tau_\pi \frac{(Y^T - \hat{c})}{Y^T}} \right) \left(\frac{\Delta Y}{Y^T} \right)^2 \tag{9}$$

Importantly, the estimated elasticity depends not only on the change in reported revenue, but also on the cost that would have been reported when bunching, since the tax base changes from gross revenue above the notch to reported profits below it.

We will compute lower and upper bounds on the true elasticity. The convergence method used to obtain the upper bound of the bunching region provides an estimate of the counterfactual revenue of the marginal buncher. Under the assumption of homogeneous elasticity across all taxpayers, the response of the marginal buncher allows us to recover the structural revenue elasticity. However, if elasticities are heterogeneous the convergence method recovers the response of the taxpayer with higher elasticity (Kleven and Waseem 2013; Londoño-Vélez and Ávila-Mahecha 2019). For that reason, we consider our estimate using that method as an upper bound on the true structural elasticity.

While the convergence method provides the revenue response of the marginal buncher, we still need the counterfactual cost to estimate the elasticity. Our model indicates the answer: since the marginal buncher is the taxpayer with the strongest incentive to bunch and incentives are inversely proportional to the profit margin, the marginal buncher has close to zero profits[17]. That allows us to set $Y^T - \hat{c} = 0$ in Equation 9 and write the reported revenue elasticity as a function of known policy

[16]We also present graphical representation of the estimates for each year in Figure A6.

[17]If firms with real low profits instead decide to declare negative profits to benefit from the exemption to loss-making taxpayers, that would lead to an even higher implied elasticity. In section IV, we show that this behavior is very muted in the data and discuss the possible reasons for that.

parameters and the estimated revenue response of the marginal buncher:

$$\epsilon_{y,(1-\tau)} \approx \left(\frac{1}{\tau_y}\right)\left(\frac{1}{2+\frac{\Delta Y}{Y^T}}\right)\left(\frac{\Delta Y}{Y^T}\right)^2 \tag{10}$$

We present results of the estimated upper bound of the elasticities in column (5) of Table 3. The key quantity needed to obtain the upper bound estimate is the revenue response of the marginal buncher, estimated using the convergence method and presented in column (4). These estimates yield upper-bound revenue elasticities in the interval of $[0.6, 2.6]$. Estimates are particularly large in 2014 (1.3) and 2015 (2.6), when the upper bound of the bunching region is estimated to be above L12 million. Estimates for 2016 and 2017 are very similar (0.61) and smaller than our preferred estimate using the pooled sample ($\epsilon_y = 0.99$). We also note estimates are noisy, with very large standard errors[18].

We now turn to the estimation of the lower bound of the revenue elasticity. Our approach is similar to the "bunching-hole" method proposed by Kleven and Waseem (2013), but adapted to take into account the fact that bunching incentives depend on firms' profit margins (Bachas and Soto 2021). We provide a brief description here and save details for Online Appendix C. Since the decision to bunch depends both on counterfactual revenue and costs, we can rewrite Equation 9 to find the counterfactual cost that would make a taxpayer indifferent between bunching or not, given a distance ΔY from the threshold and elasticity ϵ_y:

$$\hat{c}^* = Y^T\left(1-\frac{\tau_y}{\tau_\pi}\right) - \frac{\tau_y}{\tau_\pi}\frac{\Delta Y}{2} + \frac{(\Delta Y)^2}{2\epsilon_y \tau_\pi Y^T} \tag{11}$$

Since the incentives to bunch are inversely related to profit margins, we know that if a taxpayer with revenue $Y^T + \Delta Y$ and cost $\hat{c}^*$ is indifferent to bunching, all taxpayers with lower profit margins should also bunch since they face even stronger incentives. If we knew the counterfactual profit margin distribution, we could compute the share of taxpayers bunching for each revenue bin, for a given elasticity, and compare the total amount of predicted bunching to our estimated excess mass below the notch. In order to implement that strategy, we need to make an assumption about the unobserved counterfactual profit margin distribution above the threshold. We assume the profit margin distribution for firms reporting revenue in

[18] Standard errors are estimated by bootstrap and the empirical distribution of estimated elasticities is highly non-symmetrical: for the pooled sample where the point estimate is 0.99 the empirical 95% confidence interval is $[0.7, 5.7]$, meaning there is significant uncertainty on the upper bound of the estimate, but little on the lower bound. We present the histogram of our bootstrap estimates for the pooled sample in Figure A7.

the interval L6 - 8 million, significantly below the notch, is a good approximation for the unobserved distribution (Bachas and Soto 2021)[19]. We then compute the estimated elasticity as the one generating a predicted amount of bunching equal to the excess mass observed below the notch, among a range of elasticity values

One important caveat of the lower bound methodology is that we consider that all taxpayers that have an incentive to bunch will do so. There is ample evidence, nonetheless, that even when facing strictly dominated regions some taxpayers do not bunch (Kleven and Waseem 2013; Gelber, Jones, and Sacks 2020). While notches often give rise to strictly dominated regions for all taxpayers and allow researchers to estimate optimization frictions, we show in Online Appendix D that is not the case with the exemption notch in Honduras. Since the size of the discontinuous change in tax liability depends on counterfactual profit margins, the existence and extent of a dominated region also depends on the counterfactual profitability. While it is possible to make stronger assumptions, ruling out extreme preferences in order to estimate optimization frictions (Best, Cloyne, Ilzetzki, and Kleven 2020), we abstain from doing so and consider our estimates to be lower bounds for the true reported revenue elasticity: the existence of optimization frictions require, all else equal, a larger elasticity to obtain the same amount of predicted bunching mass.

We present lower bound estimates for ϵ_y in column (6) of Table 3. Here estimated elasticities are both much lower and more stable across years, and likewise much more precise and statistically different from zero in every period. While the elasticity is lower (0.2) in 2014, when we observe significantly less bunching, for the period 2015-2017 and the pooled sample estimates lie tightly between 0.35 - 0.4.

We take results for the pooled sample as our preferred estimates, where we obtain a range for the reported revenue elasticity of $[0.35, 0.99]$[20]. These are substantially larger than the estimates obtained by Bachas and Soto (2021) for corporations in Costa Rica, for example, where the similar range using lower and upper bound estimates is $[0.08, 0.33]$. They are also much larger than estimates of individual earnings elasticities in Pakistan obtained by Kleven (2018), which mostly fall in the range $[0.05, 0.3]$. Our results suggest that, under the existing enforcement environment while the minimum tax was in place, the reported gross revenue of corporations was highly elastic, limiting to some extent the ability of the tax authority to increase

[19] We show in Figure A8 that the profit margin distribution is similar for the L6 - 8 million and L10-12 million range in the period before the introduction of the minimum tax.

[20] We perform robustness exercises for the estimated elasticity of reported revenue in Table A1, using different polynomial orders. For the lower bound elasticity, the estimate is unchanged using a higher order polynomial but somewhat larger (0.5 - 0.6) when using a lower order polynomial. Consistent with noisy estimates in our preferred specification, however, estimates for the upper bound vary significantly when using different polynomials, ranging from 1.6 to 6.

revenues through higher tax rates.

c Real or misreporting response at L10 million notch?

The observed response in declared gross revenues under the minimum tax could be due to real production decisions, to under reporting of realized revenues or to a mix of both. In this section we explore the evidence related to these possibilities.

We investigate whether the amount of bunching is related to the availability of third-party information (TPI) about the sales of taxpayers. Previous studies have documented much less bunching in response to change in marginal tax rates among wage-earners than among the self-employed (Saez 2010) and also less evasion (measured by audits) for income with third-party information (Kleven, Knudsen, Kreiner, Pedersen, and Saez 2011; Londoño-Vélez and Ávila-Mahecha 2019). We hypothesize that observing less bunching among taxpayers with high "revenue observability" is evidence that misreporting is at least partially responsible for the behavior observed.

Several transactions in which firms engage, such as selling to the government or exporting, generate third-party information: these sales are directly reported to the tax authority, allowing them to independently assess part of the revenue declared by taxpayers[21]. Nonetheless, the availability of this information is limited: less than 60% of corporations have any third-party information available, and even among larger firms declaring revenue above L5 million more than 15% are not covered at all[22]. We use these reports to create a firm-level measure of revenue observability, defined as the share of self-declared revenue that is independently observed by the

[21] The tax authority has access to five sources of information on taxpayers' revenues. The most important are sales to some large companies, which are mandated to report individual purchases as part of the credit system used for VAT. The other sources are withholding of sales using credit and debit cards; sales to the government, exports, and services provided to a subset of very large companies. Data on third-party information is only consistently available since 2015 so we restrict our analysis to the period 2015-2017.

[22] In Figure A9 we provide the distribution of third-party information coverage for all firms and for those located around the L10 million threshold. Even for firms with above-median TPI coverage the tax authority only has limited information on their revenues: for only 1 out of every 10 firms the tax authority observes more than 90% of their revenues independently recorded by third-parties

tax authority[23]. Conditional on having any third-party information available, the median ratio between third-party informed and self-declared revenue is 25%.

In Figure 6, panel A, we plot the empirical density of revenue for the period 2015-2017 around the L10 million threshold separately for two groups: corporations for which some third-party information is available and those for which it is not. We observe bunching in both distributions, although there is slightly more mass below the threshold among those firms with no third-party information available. Since for a significant number of taxpayers the amount reported by third-parties is very small, we repeat the exercise in panel B, now separating the sample in those above and below the (unconditional) median of revenue observability (15%). Here we observe a much sharper bunching behavior for firms with lower revenue observability, although excess mass is still clearly present for firms with a higher degree of third-party coverage. We quantify these differences in panel A of Table 4. Whereas we estimate the excess mass at the notch for firms with above median revenue observability as four times the counterfactual density, for firms with below median observability we estimate seven times as much mass, and this difference is precisely estimated.

We provide additional evidence that bunching below the exemption threshold is partially driven by revenue misreporting by evaluating heterogeneity across industries. The availability of TPI varies systematically across industries given the nature of their economic activities. Since the main source of third-party information is withholding through the VAT credit system, revenues from firms in upstream sectors are more likely to be reported to the tax authority. On one extreme, the median corporation operating in construction or retail sees less than 15% of their total self-declared revenue being reported directly to the tax authority by third-parties. On the other, for the median firm in the manufacturing sector the revenue reported by third-parties amounts to approximately 40% of their self-reported revenue. We then evaluate whether bunching at the sectoral level is systematically correlated with the degree of revenue observability in each industry, in the spirit of the analysis in Almunia and Lopez-Rodriguez (2018) but using firm-level data on revenue observability, allowing for a direct measure of the information set available

[23]While available information is an important condition for tax authorities to enforce tax compliance, it is not sufficient. Audits in Honduras are rare but strongly size-dependent: there were less than 160 full- or partial-audits in 2014, the year the minimum tax was introduced, but almost all of them were focused on the top 20% of taxpayers in terms of revenue. We provide some information on the enforcement environment in Figure A10 and Table A2. We also note that penalties for non-compliance can be high, including fines and the loss of tax exemptions, and that approximately 7% of all corporations received some fine in 2018 for not presenting a declaration, presenting it late or including incorrect information.

for the tax authority on the revenue of taxpayers[24].

In panel B of Table 4 we present estimates of excess bunching at the notch, normalized by the predicted density at the threshold (column 2). First, we estimate large and precisely estimated excess bunching for firms in all industries. The amount of bunching, however, varies significantly across sectors: the excess mass ranges from 3.5 times the counterfactual density in manufacturing to approximately 8 times in agriculture and construction. To assess whether the amount of bunching is correlated with the availability of TPI, in Figure 7 we plot the estimated excess mass below the notch and the median revenue observability in each industry. We observe a strong negative correlation between the two measures: in industries where third-party reporting covers a larger share of a firm's revenue much less bunching is observed immediately below the L10 million notch. Consider retail, where the majority of sales are to final customers and a low penetration of debit and credit cards means that only a small fraction of corporations' revenues are reported to the tax authority. The excess mass observed below the notch is seven times the predicted density, indicating a large amount of response to the incentives provided by the minimum tax. Manufacturing firms, on the other extreme, mostly supply to other firms and see a much larger share of their total sales directly informed to the tax authority. Here the excess mass at the notch is only half that observed among retail firms. While other factors might contribute to the observed negative correlation, we interpret this as further evidence that misreporting revenues plays a role in explaining the observed bunching below the exemption threshold.

d Estimating evasion under profit taxation

We now turn to firms with gross revenue significantly above L10 million and therefore inframarginal to the bunching behavior below the notch. As documented above, the introduction of the minimum tax led to an increase in the reported profit margins and bunching around the 6% threshold, which separates the profit and revenue taxation regimes.

Let B be the excess mass of taxpayers locating around the threshold. These bunchers are coming from a continuous segment $[\Pi^T - \Delta\Pi, \Pi^T]$ below the kink: these are taxpayers that otherwise would have reported lower profit margins, but under revenue taxation increase their reported profit. The area where these bunchers

[24] Almunia and Lopez-Rodriguez (2018) rely on input-output tables to compute the share of sales from each sector to final consumers. Our sectoral definition is somewhat different from theirs, but we show in Figure A11 that our results are qualitatively similar when we use a similar industry grouping.

come from is not empty, however, since the entire distribution shifts to the right as taxpayers declare higher profit margins.

Following a very similar approach to the one used above, our goal is again to estimate the counterfactual distribution and use it to obtain an estimate of excess bunching at the kink. We estimate a counterfactual distribution of profits using a polynomial regression akin to Equation 8 and obtain estimates of the excess mass of taxpayers located around the kink[25].

In Figure A12 we present the empirical and estimated counterfactual profit margin densities for each year in the period 2014-2017. Between 90 and 210 firms are estimated to bunch around the 6% profit kink each year, an excess mass equivalent to 3-6 times the average density in the interval. In Figure 8 we present results for the pooled sample, where we estimate a similar excess mass equivalent to 5.4 times the average counterfactual density around the kink. We present the same results in the first two columns of Table 5.

Starting from the estimated excess mass around the kink, we can recover the change in reported profit margin by the marginal buncher noting that the bunching mass B around the threshold can be expressed as:

$$B = \int_{\Pi^T - \Delta\Pi}^{\Pi^T} f_0(\Pi) d\Pi \approx \Delta\Pi f_0\left(\Pi^T\right) \implies \Delta\Pi \approx \frac{B}{f_0\left(\Pi^T\right)} \tag{12}$$

where $f_0(.)$ is the counterfactual profit margin density and the approximation assumes the density is constant on the bunching segment. Empirically, we estimate $f_0(\Pi^T)$ as the average predicted density in the bunching region, and use the estimated excess mass at the kink to obtain $\Delta\hat{\Pi} \approx \frac{\hat{B}}{\hat{f}_0(\Pi^T)}$.

We present results for the estimated change in profit margins in column (3) of Table 5. With the exception of 2014, when we observe less bunching, estimates for 2015-2017 and for the pooled sample are very similar: the marginal buncher increased declared profit margin between 0.9 - 1.1 percentage points, a narrow range of precisely estimated responses. To put it differently, the marginal buncher would have declared a profit margin of approximately 5% under profit taxation, when incentives to misreport are strong and production decisions are undistorted.

In order to interpret the magnitude of these changes in reported profit and separate the total effect between cost evasion and production decisions, we use the decomposition of reported profit margin response developed by Best et al. (2015). Totally differentiating the reported profit margin and considering the incentives of

[25]We compute the number of taxpayers in bins 0.2 p.p. wide. Following the literature, we determine visually the lower and upper bounds of the bunching region.

a taxpayer around the kink yields:

$$\Delta\hat{\Pi} = \frac{\tau_y^2}{\tau_\pi}\epsilon_{y,(1-\tau)} - \frac{d(\hat{c} - c(y))}{y} \tag{13}$$

The main insight provided by the decomposition is that, since the tax rate on revenues is often very small (0.015 in the case of Honduras), even large revenue elasticities will only generate second-order effects on the change in reported profit margins. If we observe large increases in reported profit margins from the marginal buncher, then changes due to evasion incentives must be playing a large role. We illustrate that point in column (4) of Table 5, where we consider the implied revenue elasticity in a model where there is no cost evasion. For all years and for the pooled sample, the implied elasticities under no cost evasion are implausibly high: with the exception of 2014 when the estimate is 6.7, the remaining elasticities of 10-12 are four times larger than our largest estimate in Table 3 and an order of magnitude higher than our preferred estimates, suggesting that cost evasion must be playing a significant role in explaining the observed response.

We present our estimates of misreporting in column (6). We use the upper bound elasticity $\epsilon_y = 0.99$ obtained for the pooled sample, so evasion estimates are a lower bound of the true evasion, and express evasion as a share of reported profits. With the exception of 2014, where bunching is smaller, in the period 2015-2017 and using the pooled data we estimate that cost misreporting is in the range of 13-17% of reported profits. Results are practically unchanged when we consider alternative polynomial orders in our estimates, as reported in Table A3. They are also very similar if we consider that evasion is purely driven by misreporting in revenue instead of costs (Table A4).

These estimates are very similar to evasion documented by Best et al. (2015) for most corporations in Pakistan, which also fall in the range of $[0.13, 0.17]$, and by Alejos (2018) for corporations in Guatemala that fail to claim an exemption to the local minimum tax. Our results reinforce these previous findings that evasion through cost misreporting in lower income countries is significant even for large corporations, making the use of taxation of broader bases a potential tool to increase tax revenues.

e The composition of cost adjustments

In the previous section we document that corporations evade a substantial amount of taxes by over reporting costs under a profit regime, and immediately change their reporting behavior when evasion incentives disappear under the minimum tax. One relevant policy question arising from these evasion responses is whether firms adjust all cost categories similarly between these regimes, or if some cost items seem particularly prone to evasion.

We first present evidence, in Figure 9, that deduction levels change discontinuously at the L10 million revenue threshold, consistent with the fact that, under the minimum tax, firms above the threshold increase their reported profits. Reassuringly, we observe no discontinuity in claimed costs in the period 2011-2013, before the minimum tax was in place. In order to assess whether specific cost categories are more responsive to the change in incentives, we use detailed cost items claimed in corporate income tax filings to construct five broad cost categories: Labor, Goods and Materials, Operations, Financial and Losses & others[26]. In Figure 10, Panel A, we present costs as a share of gross revenue for each bin of declared revenue. The figure suggests that costs related to the purchase of goods and materials are the only ones that significantly change at the L10 million threshold. While for firms declaring revenue below L10 million the participation of goods and materials steadily increases, the average share of those costs falls discontinuously by over 5 p.p. at the threshold and remains at a lower level for firms declaring up to L15 million in revenue. We do not observe a similar discontinuous fall in claimed deductions for other categories that generate more paper trails, such as financial or labor costs. In Panel B of the same figure we focus on the goods and materials category, showing that the discontinuous change observed at the notch is not observed in 2018, when the exemption threshold increases to L300 million.

We present a more formal test of whether these discontinuities can be attributed to the minimum tax in Table 6. Since we previously presented strong evidence that taxpayers strategically locate below the revenue threshold in order to avoid the minimum tax, we cannot simply estimate a regression discontinuity at the notch. Instead we estimate a linear "donut-hole" discontinuity regression, evaluating whether the level of costs change at the threshold but extrapolating from revenue levels not affected by bunching behavior.

In Column (1) we present results from a specification using median deductions by bin as the dependent variable. We estimate that the amount of claimed deductions falls by approximately L260,000 at the threshold, consistent with the non-parametric evidence presented. Since the median deduction at the threshold is L9.8 million, the estimated effect implies that the median firm above the threshold decreases deduction claims by 2.7% and doubles the reported profit margin. In

[26]The detailed breakdown of cost categories only exists for firms declaring using the electronic form introduced in 2015. In all exercises using detailed cost data, we restrict our sample to the period 2015-2018 and to taxpayers filing electronically (70 - 80% of all corporations).

Columns (2) through (5) we repeat the same exercise but use the ratio of deductions to revenue as the dependent variable. The only estimate statistically different from zero and meaningful in magnitude is goods and material costs: they fall by almost 5 p.p. from an average of 37% below the notch. Mosberger (2016), using a different empirical strategy, also documents a significant change in goods and materials costs by firms facing a minimum tax in Hungary, suggesting this seems to be a deduction category particularly over reported by firms trying to reduce profit tax liabilities and therefore a potential focus for tax authorities[27].

IV Robustness and additional exercises

In this section we provide additional evidence that the empirical patterns discussed previously are indeed the result of corporate responses to the minimum tax.

Our main sample consists of an unbalanced panel of corporations. Since the number of firms filing income tax increases significantly during the period, one might worry that results are purely driven by sample composition. We show that this is not the case by restricting the sample to a subset of approximately 12,000 firms observed in every year between 2013 and 2018. In panel A of Figure A13 we present empirical revenue densities and in panel B we present profit margin densities for each year. The same pattern observed in the full sample is present in the balanced panel: an excess of firms reporting revenue slightly below L10 million and larger firms bunching around a 6% profit margin in 2014-2017, but not before or after the exemption threshold was substantially increased.

We perform two additional exercises that strengthen our case that the shift observed in declared profit margins by firms above the revenue exemption threshold was a response to the specific features of the minimum tax. First, as mentioned in section I, a small number of industries were subject to a reduced minimum tax rate of 0.75% instead of 1.5%. Corporations in those industries therefore face a kink in the tax schedule not at 6% rate of profit margin but at $\frac{0.0075}{0.25} = 3\%$, and according to our model we should observe excess mass around that threshold. In Figure A14 we show that is precisely what happens: between 2014-2017, the distribution of

[27] The enforcement environment to assess the veracity of claimed deductions in Honduras, as in other low- and middle-income countries, is limited. Carrillo et al. (2022), for example, show that in Chile corporations "are required to file purchase annexes, which includes supplying valid invoice numbers" to validate non-labor cost deductions. This relates directly to the existence of "ghost firms" or "invoice mill", that exist only to supply plausible VAT credits and purchasing costs to existing firms (Waseem 2020; Mittal, Reich, and Mahajan 2018). In Honduras, corporations are not required to file this detailed information to claim credits: the only mechanism for the Tax Authority to verify these deductions is to perform costly audits which, as we discuss above, are limited in number.

profit margins for firms in these industries is shifted to the left when compared to corporations facing the 1.5% minimum tax and the peak of the distribution is exactly around 3%.

Second, we also investigate whether the increase in declared profit margins is induced by "lazy cost reporting" (Best et al. 2015). If there are fixed-costs in filing different cost line items, taxpayers might respond to revenue taxation by reducing the number of items filed and therefore generating an increase in profit margins, even if they were reporting truthfully under a profit taxation regime. We investigate whether there are significant changes in the share of cost line items reported in Figure A15. Panel A presents the share across the 6% profit margin kink, for firms reporting revenue above L13 million, while panel B reports shares across the L10 million notch. If the observed changes in deductions/profit were being driven by filing costs, we should expect an increase in the share of items reported when firms report profit margins above 6% (Panel A) and a decrease for firms reporting above the exemption threshold (Panel B). Instead, shares are mostly smooth across the thresholds, and no different from the behavior of firms in 2018, when the exemption threshold was much higher and fewer firms were subject to the minimum tax. These results suggest it is unlikely that costly filing drives our results, at least on the extensive margin, and point to the importance of evasion under profit taxation.

The introduction of the minimum tax might also have affected firm survival: corporations that might be viable under profit taxes might cease to be if they must pay taxes based on gross revenue, making the enterprise unprofitable. While we do not have a clear design that allows us to estimate the causal impact of the policy on firm exit, in Appendix I we perform a series of empirical exercises to assess whether affected firms were more likely to stop filing taxes after the 2014 reform. Our exercises rely on the assumption that firms likely to be affected by the reform – those declaring gross revenue above L10 million and profit margins below 6% before the reform – would have exited at a similar rate as those less likely to be affected. Our estimates are quite sensitive to sample selection and not robust to placebo tests that consider effects in the years before the introduction of the minimum tax. For those reasons, we are unable to make statements about the effects of the policy on firm survival.

We also consider whether the provision exempting firms declaring losses from paying the minimum tax might be a serious concern for our estimates. First, as we previously noted, our elasticity estimates assume that the incentives to bunch and profit margins are inversely correlated. If some corporations with lower profits systematically decide to declare losses instead of bunching, that would require higher elasticities for a given estimate of bunching below the L10 million threshold. Empirically, nonetheless, we do not see a strong response from firms to that exemption. As we document in Figure A26, we do not see a sharp increase in firms not paying taxes above the L10 million threshold: the decrease in firms paying profit taxes is accompanied by an increase in firms paying the minimum tax. We also do not see a strong reaction of firms declaring profits right below zero in order to escape the minimum tax after 2014 (see Figure A16). The reasons for this are likely manyfold, but seem to include ex-ante uncertainty on the exact nature of that exemption and whether firms declaring losses would indeed be exempt and/or required to be audited in order to claim the benefit. The behavior was also likely curbed by the existence of a net asset tax, discussed in Appendix F, that applied to all firms with net assets above L3 million, including those incurring in losses.

V Assessing the impact of counterfactual policies

In order to make progress in quantifying the impacts of the minimum tax and alternative tax policies, we make stronger parametric assumptions about the profit function of firms and calibrate a model. We consider firms with isoelastic production costs and cost misreporting loss functions so we can rewrite Equation 1 as follows:

$$\hat{\Pi}(y,\hat{c}) = y - \alpha_i - \frac{\theta_i}{1+1/e}\left(\frac{y}{\theta_i}\right)^{(1+1/e)} - \tau(y-\mu\hat{c}) - \frac{B_i}{1+1/\gamma}\Big(\hat{c}-c(y)\Big)^{(1+1/\gamma)} \tag{14}$$

Taxpayers are heterogeneous in three dimensions, characterized by the vector $(\theta_i, \alpha_i, B_i)$ that define productivity, production fixed cost and evasion ability, respectively. Heterogeneity in productivity allows firms to have different optimal production levels, while varying fixed costs generates a distribution of profit margins. We consider the maximization problem of firms under a simple profit taxation regime and calibrate the model using the parameters previously estimated and data from 2013, before the introduction of the minimum tax. We set $e = 0.99$, the upper bound revenue elasticity from our pooled sample, and use the estimates from Best et al. (2015) for evasion cost elasticity $\gamma = 1.5$. We then calibrate the remaining parameters to match the distributions of reported revenue and reported costs, considering that firms evade 17% of profits through cost over-reporting (additional details are presented in Online Appendix E).

We perform two main exercises. First, we simulate the actual minimum tax system implemented in Honduras in 2014, with an exemption threshold for firms reporting gross revenue below L10 million and minimum effective tax of 1.5% for larger firms. Second, we consider an alternative to the minimum tax regime where the tax authority increases the average tax rate that large firms pay on profits.

We present results for our first exercise in Table 7. First, consider the actual minimum tax implemented, in which firms reporting gross revenue below L10 million are exempt and those above face a minimum tax liability of 1.5% of gross revenue. We estimate that over 60% of corporations declaring revenue above the exemption threshold are liable for the minimum tax and that total government revenues increase by over 30% when compared to a flat profit tax rate of 25%[28]. This is attained by a 120% increase in the aggregate tax liability of firms paying the minimum tax and a decrease of 10% in aggregate profit for all firms in the economy. The fall in aggregate profits shows that, under the parameters of the actual policy implemented, the potential gains for firms when moving from profit to revenue taxation (decrease in losses from misreporting costs) are much smaller than losses from higher tax liability and production distortions.

Our calibrated model also allows us to quantify the strong incentives introduced by the exemption notch: the total tax liability of bunching firms is less than 25% of what they would have paid had they stayed above the threshold and paid the minimum tax. Despite that strong reaction at the margin, the increase in taxes paid by infra marginal firms dwarfs this loss: reduction in taxes from bunching firms is only 1% of total revenue from the minimum tax. While in our model bunching below the exemption threshold is exclusively driven by real production decisions, we provided evidence that at least part of this behavior seems to be explained by revenue misreporting. That finding highlights that, despite generating relatively small aggregate losses, notches can generate large horizontal inequities: firms otherwise similar might be liable for vastly different tax burdens simply due to willingness to misreport revenue.

We also assess the impact of alternative minimum tax specifications, in which we vary both the exemption threshold and the minimum tax rate. We highlight two features of our simulations. First, holding constant the minimum tax rate on gross revenues, increasing the exemption threshold only slowly decreases total revenue gains due to the long right tail of firm size. A L50 million exemption threshold, for example, still increases tax revenue by 23%. Second, small changes in the minimum tax rate generate large impacts in aggregate tax revenue and firms' profit, given the very broad base. Using the same L10 million exemption threshold and considering

[28] In these simulations we exclude taxpayers that were liable for Net Asset tax in 2013, since we do not model firms' asset accumulation and reporting decisions.

a minimum tax rate of 0.5%, for example, generates a tax revenue increase of less than 4% and aggregate profit loss of 0.5%. When comparing these magnitudes with the actual policy implemented, the decrease in tax revenue gain is driven by two forces. First, the minimum "allowable" profit margin is now lower: corporations with a 5% profit margin, for example, are allowed to pay an effective tax rate of 25%*5% = 1.25% when the minimum tax is 0.5%, while they would be liable for the 1.5% minimum tax under the previous regime. Second, firms with very low profit margins now only pay 0.5% in effective tax rate instead of 1.5%.

Our second exercise considers a progressive tax schedule in which firms declaring gross revenue above L10 million face an increase in *average* tax rates, without a change in the tax base (reported profits). We consider that the average tax rate is still 25% for firms below the exemption threshold, so firms also face a discontinuous change in tax liability when reporting revenue above L10 million and will have a strong incentive to bunch below the threshold. Unlike in our setting where firms with low profits benefit the most from bunching, here firms with high profit margins face the strongest incentives to locate below the notch, since they have the most to lose from higher tax rates. We present results for scenarios that consider an average profit tax rate between 30% and 50% in Table 8. Increasing the average tax rate by 5 p.p. to 30%, for example, would increase tax revenues by 12% and reduce aggregate corporate profits by 7%. In order to generate the same amount of tax revenue gains as the minimum tax, average taxes have to increase by 15 p.p. to 40%. While production efficiency is preserved under high tax rate profit taxation, evasion costs are exacerbated in this scenario and lead to large losses in aggregate profits, which fall by 20%.

VI Conclusion

Minimum taxes are seen as effective tools for tax authorities to curb tax evasion in low- and middle-income countries and are at the heart of recent debates on global tax cooperation. In this paper we provide new evidence on corporate reaction to minimum taxes in Honduras.

We document meaningful evasion under profit taxation. Corporations liable for a minimum tax declare much larger profit margins when the incentives to over report costs disappears. We quantify that response and estimate that inflated costs allowed these firms to reduce tax liabilities by up to 17%. Curbing evasion through excessive reporting of deductions is costly to tax authorities (Carrillo, Pomeranz, and Singhal 2017) since it requires time-intensive verification of receipts. We provide evidence that taxpayers exploit these limitations and use hard-to-verify cost categories to reduce tax liability. Improving oversight of these specific deductions seems to be a natural focal point for the efforts of tax authorities.

Using the response of taxpayers to the notch created by the exemption threshold, we bound the elasticity of reported revenue with respect to the net-of-tax rate at [0.35, 1]. These estimates are substantially higher than previous results for corporate taxpayers in similar settings and illustrate the limits faced by authorities in imposing high tax rates on broader bases. Whereas the elasticity of reported revenue summarizes responses both through real production and reporting decisions, we provide evidence that at least part of the observed response is due to revenue under-reporting. Firms with high revenue observability are less likely to strategically locate below the exemption threshold.

These results highlight the fact that behavioral responses of taxpayers are endogenous to the enforcement environment (Fack and Landais 2016; Slemrod and Kopczuk 2002). Building state capacity and properly designing rules to enforce tax compliance, therefore, might substantially change the trade-offs between available instruments. In the case of minimum taxes, improving the ability to assert the veracity of claimed deductions should decrease evasion through cost misreporting, making profit taxation more attractive. Improvements in independent verification of taxpayers' declared revenue, conversely, make broadening the tax base more attractive by reducing the elasticity of reported revenue.

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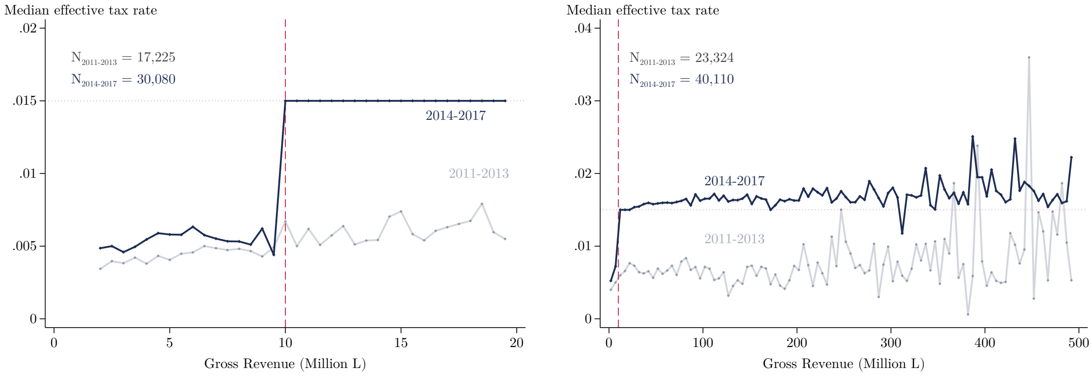
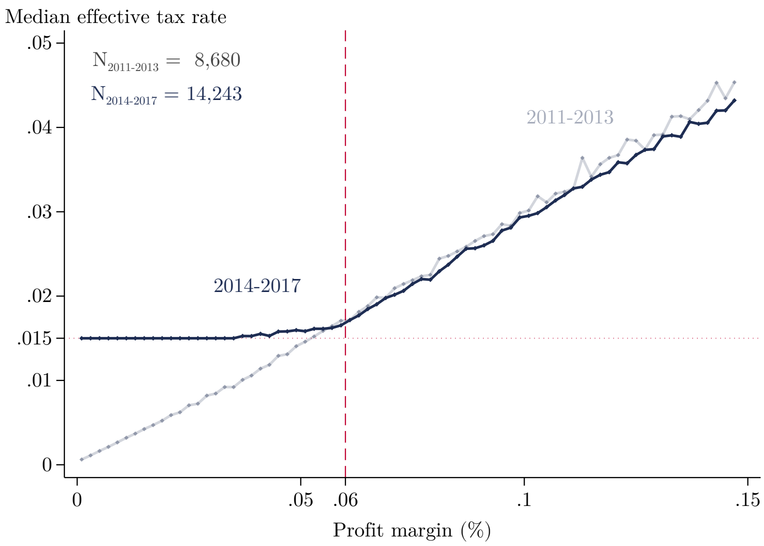
Figure 1: Median effective tax rate across declared revenue distribution



(a) Around L10 million exemption threshold (b) Across gross revenue distribution

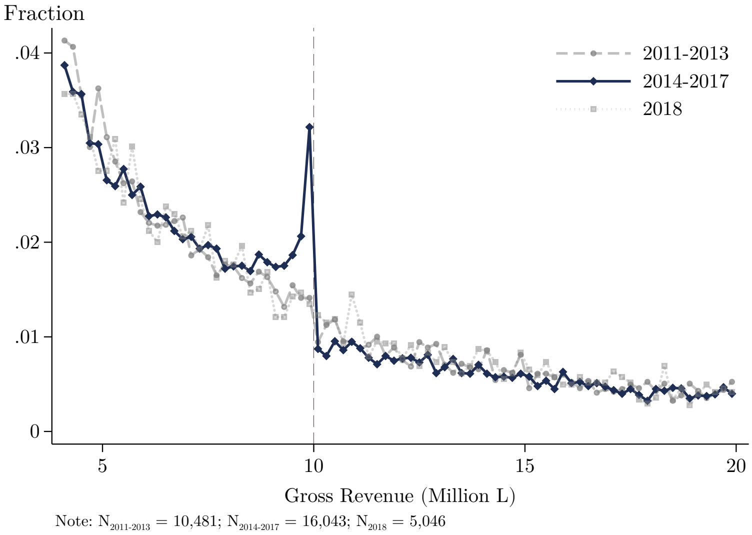
Note: This figure presents median effective tax rates, defined as the ratio between tax liability and gross revenue, for each bin of declared gross revenue. Panel A restricts the sample to taxpayers declaring gross revenue between L2-20 million, while panel B includes taxpayers with gross revenue between L2 - 500 million. Bins are L500,000 wide in Panel A and L5 million in Panel B.

Figure 2: Median effective tax rate across declared profit margin distribution



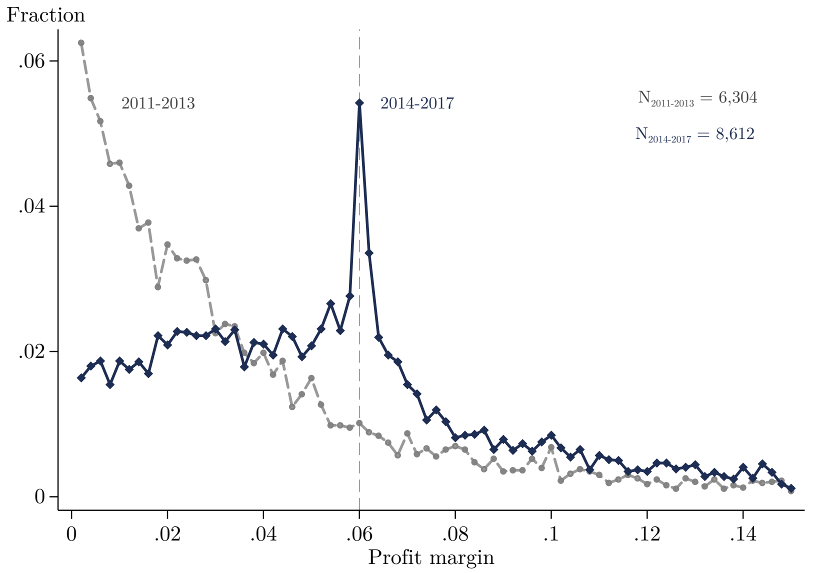
Note: This figure presents median effective tax rates, defined as the ratio between tax liability and gross revenue, for each bin of declared profit margin. The sample is restricted to firms declaring gross revenue above L13 million, and therefore inframarginal to bunching at the L10 million threshold. Bins are 0.2 p.p. wide.

Figure 3: Empirical Density of Gross Revenue around L10 Million threshold

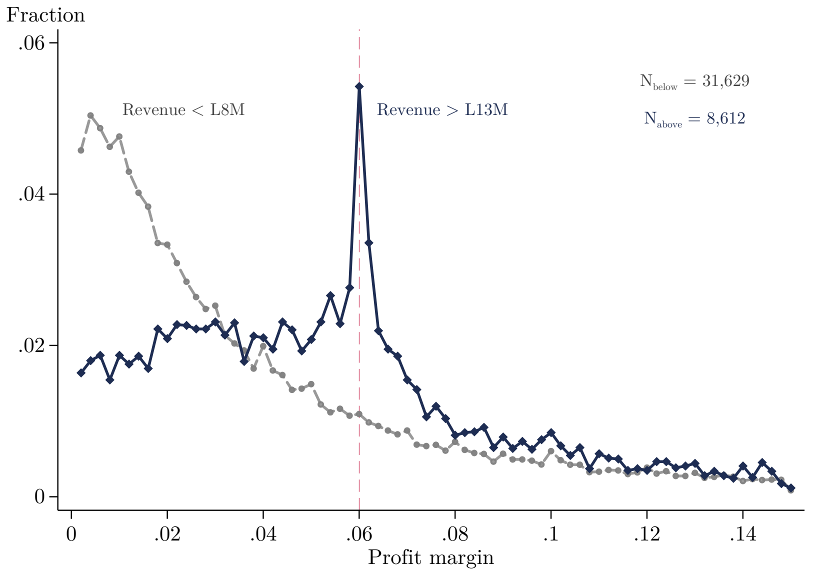


Note: This figure presents the empirical density of gross revenues from firms pooled for three periods: 2011-2013 (before the minimum tax introduction); 2014-2017 (when the exemption threshold was L10 million); and 2018 (after the threshold for eligibility increased to L300 million). Bins are L200,000 wide. The sample is restricted to taxpayers declaring gross revenue between L4-20 million and excludes taxpayers exempt from the minimum tax.

Figure 4: Empirical density of profit margins



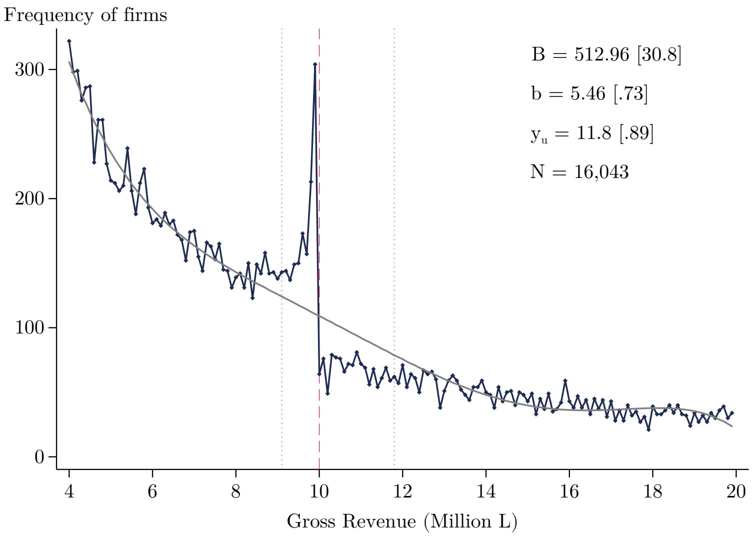
(a) Empirical density of profit margins above L13 million - Pre and Post Minimum Tax



(b) Empirical density of profit margins in 2014-2017 - Below and above L10 million threshold

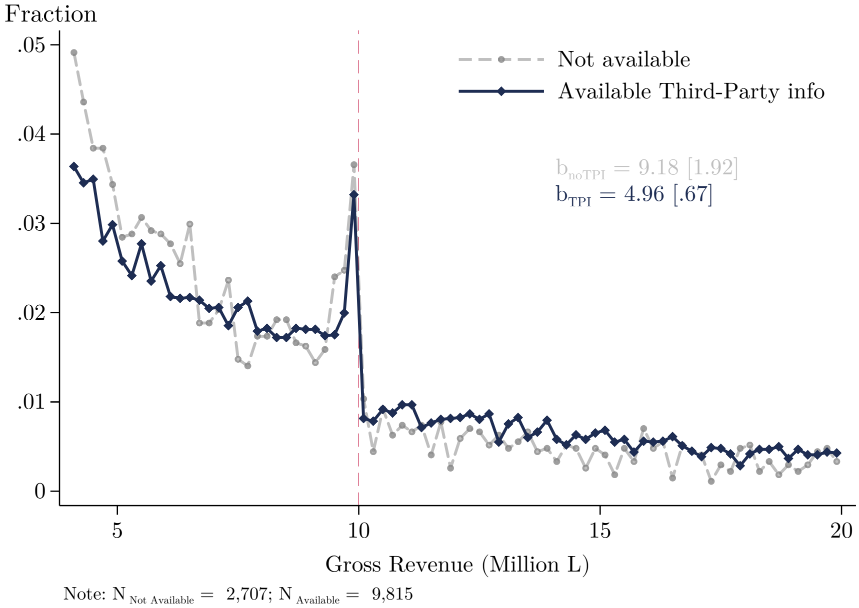
Note: These figures present the empirical density of positive reported profit margins. Panel A presents densities for firms with gross revenue above L13 million, before (2011-2013) and during (2014-2017) the existence of the minimum tax. Panel B present densities for the period of 2014-2017 of two groups of firms: those reporting gross revenue below L8 million (exempt from minimum tax) and those above L13 million (potentially liable for the minimum tax and infra-marginal to the bunching behavior at L10 million in revenue). Bins are 0.2 percentage points wide and the first bin starts at 0.1%, such that the 6% kink is the midpoint of a bin.

Figure 5: Empirical Density of Gross Revenue around L10 million threshold - Pooled Years (2014-2017)

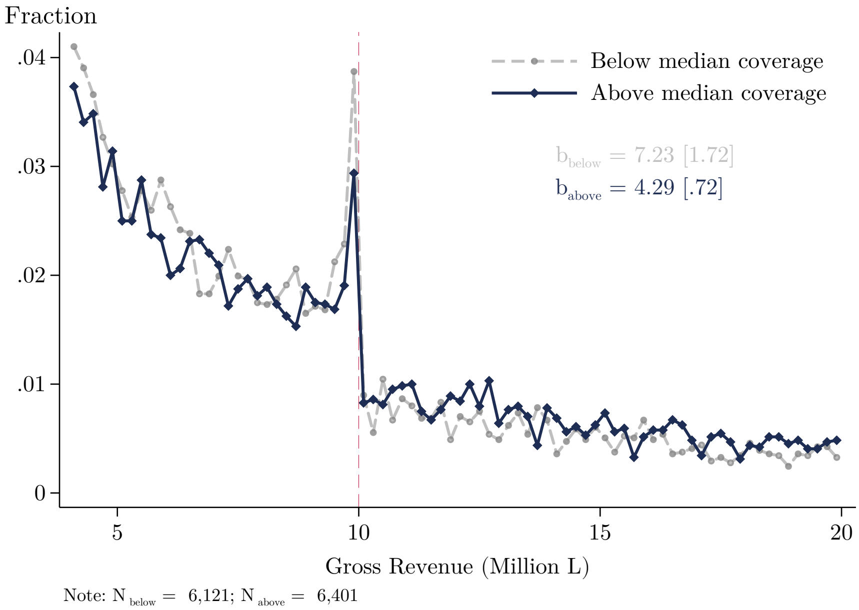


Note: This figure presents empirical and counterfactual densities of declared gross revenue for a pooled sample of firms (2014-2017). The dashed line marks the L10 million notch while the dotted lines mark the lower and upper bounds of the bunching region. We present the excess mass below the notch (B), the excess mass as a share of the predicted mass in the bunching region (b), the upper bound obtained from the convergence method (y_u) and the underlying number of taxpayers in each figure (N). Standard errors in brackets are obtained through bootstrapping. Bins are L100,000 wide.

Figure 6: Empirical gross revenue density by third-party status - pooled 2015-2017



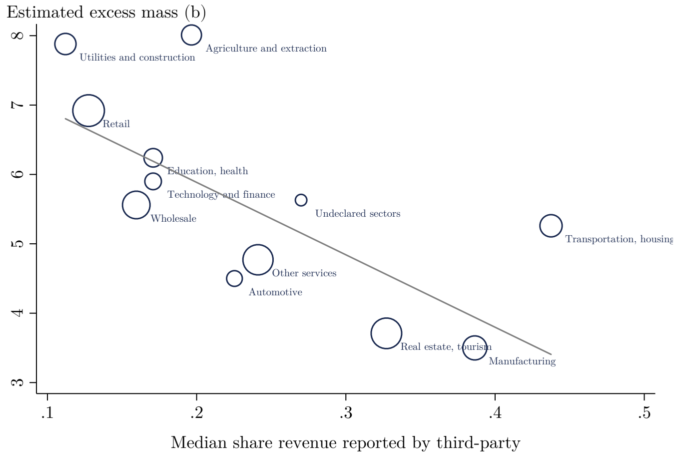
(a) Extensive margin



(b) Intensive margin

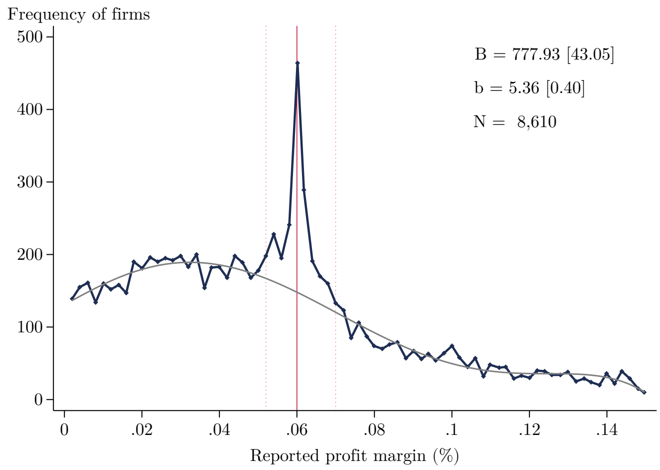
Note: These figure presents the empirical densities of declared gross revenue, pooled for the 2015-2017 period, exploring heterogeneity according to availability of third-party information on revenue. Panel A compares corporations for which no third-party information is available (gray line) with those for which some information is available (blue line). Panel B explores differences in the intensive margin of third-party information: it compares firms with below median (15%) share of declared revenue reported by third parties (gray line) with those above median (blue line). Bins are L200,000 wide.

Figure 7: Scatter plot of amount of bunching vs. revenue observability across industries



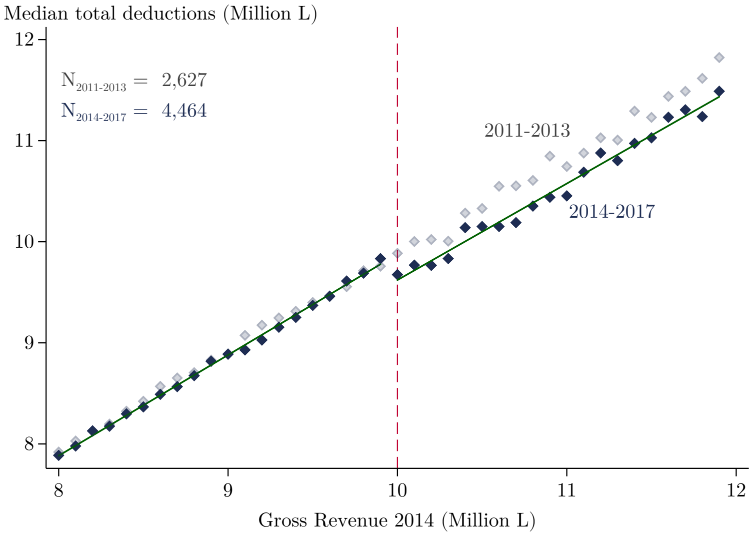
Note: This figure presents a scatter plot of estimated excess mass at the L10 million threshold and the median share of self-reported revenue also informed by third parties in each industry. Excess mass is defined as the excess number of firms bunching at the L10 million notch as a ratio of the predicted mass at the notch. The share of reported revenues is calculated in 2018, for firms declaring gross revenues in the interval L5-15 million. The size of markers is proportional to the reported sales in 2018 by industries.

Figure 8: Empirical Density around 6% profit margin threshold - Pooled Years (2014-2017)



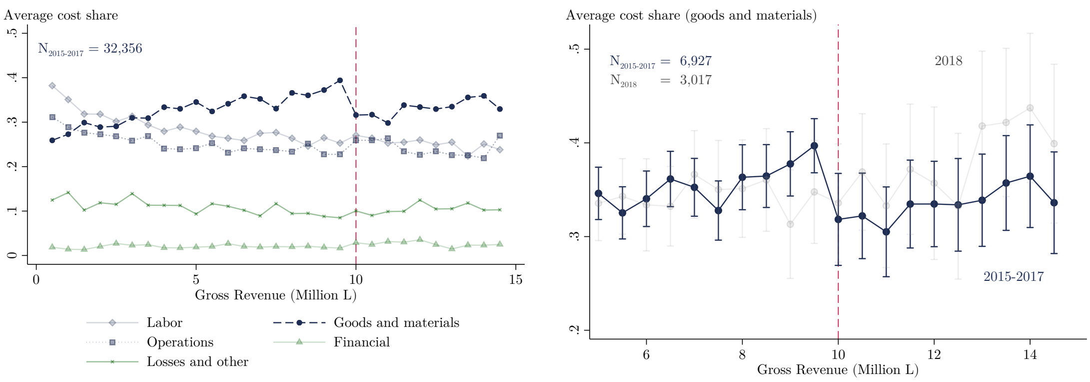
Note: These figures present the empirical and estimated counterfactual distributions of profit margins for a pooled sample of firms in the period period 2014-2017. The lower and upper bounds of the bunching region are determined visually. The solid red line marks the 6% kink while the dotted lines present the lower and upper bounds of the bunching region. We present the excess mass around the kink (B), the excess mass as a share of predicted density around the kink (b) and the underlying number of taxpayers in each figure (N). Standard errors in brackets are obtained through bootstrapping. Bins are 0.2 percentage points wide and the first bin starts at 0.1%, such that the 6% kink is the midpoint of a bin.

Figure 9: Median total deductions by gross revenue



Note: This figure presents median reported total deductions by revenue bin for two groups: taxpayers in 2011-2013, before the introduction of the minimum tax, and 2014-2017, while the minimum tax was in place with a L10 million exemption threshold. Bins are L100,000 wide.

Figure 10: Cost line items as share of revenue



(a) All categories (2015-2017)

(b) Goods and materials (2015-2017 & 2018)

Note: These figures present cost line items as share of revenues in each bin. Panel A presents average shares in 2015-2017 for five cost categories: Labor, Goods and Materials, Operations, Financial, and Losses and other. Panel B focuses on Goods and Materials cost shares, separately for 2015-2017 and 2018. Bins are L500,000 wide in both panels. This sample only includes taxpayers using electronic declaration, for which we have detailed breakdown of cost items (approximately 80% of taxpayers per year) and excludes taxpayers with profit margins above the 99th and below 1st percentile of profit margin distribution.

Table 1: Descriptive statistics

	2013	2014	2015	2016	2017	2018
Overall firms' characteristics						
Revenue (Million L)	31.35	30.81	27.99	26.49	28.31	27.47
	(336.33)	(329.80)	(293.49)	(257.53)	(317.50)	(314.64)
Deduction (Million L)	30.54	30.00	26.59	24.85	26.92	26.33
	(347.37)	(342.83)	(281.04)	(235.07)	(311.61)	(299.31)
Pre-tax profits (Million L)	0.83	0.87	1.44	1.68	1.48	1.22
	(63.59)	(65.57)	(40.91)	(33.25)	(54.17)	(57.37)
Pre-tax profit margin (%)	1.94	2.36	3.13	4.19	4.14	4.89
	(20.18)	(21.38)	(22.43)	(22.33)	(22.44)	(24.87)
Tax liability (Million L)	0.54	0.67	0.69	0.68	0.72	0.68
	(10.90)	(10.80)	(11.09)	(9.86)	(11.89)	(12.24)
Exempt from Minimum Tax (%)	.	17.8	24.6	26.3	22.2	21.1
Revenue above L10 Million (%)	18.0	17.4	16.7	17.1	17.1	17.9
Not exempt and above L10 million (%)	.	16.2	14.7	14.1	14.2	16.1
Paid Minimum Tax (%)	.	8.1	6.6	6.1	6.4	0.5
Share taxes from Minimum Tax (%)	.	29.5	21.6	19.5	19.8	14.6
Share of MNC (%)	3.5	3.6	3.2	3.0	2.8	2.6
Share taxes from MNC (%)	66.4	65.4	62.0	60.0	58.7	60.7
N	19,223	20,464	23,658	25,729	27,825	29,944

Note: This table reports descriptive statistics for the sample of corporations filing income taxes in Honduras in the period 2013-2018. Profit margins are defined as the ratio between tax liability and gross revenue and are trimmed below -100% when calculating yearly averages in this table. Exemption from the minimum taxes is defined for taxpayers in first two years of operation and/or by economic sector, and does not include taxpayers declaring revenue below the exemption threshold. Multinational corporations (MNC) are identified as firms presenting a transfer price declaration in the period 2014-2018.

Table 2: Share of revenue and taxes across gross revenue distribution

	2013		**2017**	
	(1)	(2)	(3)	(4)
	Revenue	Taxes	Revenue	Taxes
Top 0.1%	28.1	32.2	28.5	34.3
Top 1%	63.0	68.6	63.4	67.2
Top 10%	91.0	91.9	90.8	93.2
Top 20%	95.8	96.2	95.6	97.1
Bottom 50%	0.6	0.9	0.5	0.7

Note: This table presents the share of total revenue and total taxes for corporations at the top 0.1%, top 1%, top 10%, top 20% and the bottom 50% of declared yearly gross revenues. Columns (1) and (2) refer to statistics in 2013, while columns (3) and (4) refer to 2017. Corporations exempt from all income taxes are excluded from the sample.

Table 3: Estimates by year for L10 million notch

Year	(1) Excess # Firms (B)	(2) Firms % counterfactual (b)	(3) $\mathrm{y_u}$ (upper bound)	(4) Δ Revenue (upper bound)	(5) ϵ_{y} (upper)	(6) ϵ_{y} (lower)
2014	84.63	4.21	12.10	2.10	1.33	0.20
	(11.14)	*(0.86)*	*(0.96)*	*(0.96)*	*(1.53)*	*(0.06)*
2015	120.54	6.12	13.00	3.00	2.61	0.40
	(10.12)	*(0.90)*	*(0.92)*	*(0.92)*	*(1.53)*	*(0.08)*
2016	142.05	5.55	11.40	1.40	0.61	0.40
	(18.63)	*(1.28)*	*(1.00)*	*(1.00)*	*(1.44)*	*(0.13)*
2017	144.54	5.22	11.40	1.40	0.61	0.35
	(11.21)	*(0.82)*	*(0.90)*	*(0.90)*	*(1.30)*	*(0.06)*
Pooled	512.96	5.46	11.80	1.80	0.99	0.35
	(30.80)	*(0.73)*	*(0.89)*	*(0.89)*	*(1.40)*	*(0.05)*

Note: This table presents estimates of change in reported revenue and elasticities for each year in the period 2014-2017 and also for all years pooled. The first column reports the estimated excess number of firms, defined above as $\sum_{b=y_L}^{y_N}(n_j - \hat{n}_j)$, while column 2 reports the ratio between excess mass and average counterfactual density in the bunching region. Column (3) presents the upper bound estimated using the convergence method and column (4) the change in revenue. Column (5) presents the upper bound estimates of reported revenue elasticity, defined in Equation 10, while column (6) presents the lower bound estimates using the methodology presented in section 4.3. Bootstrapped standard-errors are presented in parentheses.

Table 4: Bunching at L10 million notch - by TPI and industries

	(1) Excess # Firms (B)	(2) Firms % counterfactual (b)	(3) Number Observations
Third-party information			
Below median TPI	253.33	7.23	6,121
	(23.00)	*(1.72)*	
Above median TPI	166.76	4.29	6,401
	(15.87)	*(0.72)*	
Industries			
Agriculture and extraction	45.75	8.01	865
	(3.62)	*(0.97)*	
Manufacturing	38.09	3.50	1,516
	(7.48)	*(1.29)*	
Utilities and construction	52.20	7.88	1,038
	(6.46)	*(1.90)*	
Automotive	16.70	4.50	650
	(6.08)	*(2.07)*	
Wholesale	65.11	5.56	1,880
	(8.93)	*(0.91)*	
Retail	71.64	6.92	1,884
	(13.01)	*(1.69)*	
Transportation, housing	31.65	5.26	1,174
	(10.09)	*(2.31)*	
Technology and finance	23.70	5.90	757
	(5.39)	*(1.49)*	
Real estate, tourism,other	48.30	3.71	2,530
	(9.40)	*(0.67)*	
Education, health, entertainment	37.00	6.24	1,050
	(10.72)	*(2.15)*	
Other services	62.23	4.77	2,298
	(10.74)	*(1.51)*	
Undeclared sectors	16.33	5.63	401
	(5.20)	*(2.06)*	

Note: This table presents estimates of bunching below the L10 million notch for firms with different levels of third-party information (TPI) (panel A) and in different industries (panel B). Column (1) presents the estimated excess mass of firms while column (2) presents the ratio between excess mass and average counterfactual density in the bunching region. Column (3) presents the number of firms for each exercise. Bootstrapped standard-errors are presented in parentheses.

Table 5: Estimated responses at the kink

Year	(1) Excess Mass (B)	(2) Bunching (b)	(3) Delta Profit ($\Delta\Pi$)	(4) Implied ϵ_y (no evasion)	(5) Estimated evasion ($\epsilon_y = 0.99$)
2014	92.04	3.07	0.60	6.67	-8.52
	(10.61)	*(0.43)*	*(0.10)*	*(1.01)*	*(1.51)*
2015	192.76	5.18	1.00	11.11	-15.18
	(13.80)	*(0.51)*	*(0.10)*	*(1.19)*	*(1.78)*
2016	212.94	5.68	1.10	12.22	-16.85
	(14.13)	*(0.52)*	*(0.10)*	*(1.18)*	*(1.77)*
2017	212.68	4.57	0.90	10.00	-13.52
	(16.13)	*(0.46)*	*(0.10)*	*(1.06)*	*(1.59)*
Pooled	777.93	5.36	1.10	12.22	-16.85
	(43.05)	*(0.40)*	*(0.10)*	*(0.97)*	*(1.46)*

Note: This table presents estimates of change in reported profit margins and evasion estimates for each year in the period 2014-2017 and also for all years pooled. Column (1) reports the estimated excess number of firms while column (2) reports the ratio between excess mass and average counterfactual density in the bunching region. Column (3) presents estimated change in profit margins. Column (4) presents the implied revenue elasticity using the decomposition in Equation 13 and considering no cost evasion. Column (5) computes the estimated cost evasion using the same decomposition and $\epsilon_y = 0.99$, our preferred estimate for the revenue elasticity upper bound. Bootstrapped standard-errors are presented in parentheses.

Table 6: Deductions discontinuity at the notch

		Deductions components (% of revenue)				
	(1) Total deductions	(2) Labor	(3) Materials	(4) Operation	(5) Financial	(6) Other
Jump in cost	-0.265	0.0108	-0.0483	-0.00268	0.00419	0.0120
	(0.061)	(0.018)	(0.024)	(0.017)	(0.006)	(0.017)
Slope below threshold	0.983	-0.00573	0.00793	-0.00133	0.000893	-0.00281
	(0.003)	(0.003)	(0.004)	(0.003)	(0.001)	(0.002)
Slope change above threshold	-0.0283	0.00207	-0.00200	0.00162	-0.00137	0.00339
	(0.012)	(0.004)	(0.005)	(0.003)	(0.001)	(0.003)
Intercept	9.764	0.250	0.373	0.233	0.0205	0.0931
	(0.012)	(0.011)	(0.014)	(0.010)	(0.003)	(0.009)
Observations	160	160	160	160	160	160
R-Squared	0.999	0.214	0.225	0.149	0.266	0.165

Note: This table reports results of "donut-hole" discontinuity regressions using binned data for firms declaring between L4 and L20 million in revenue. The dependent variable is median claimed deductions in column (1) and mean cost as a share of declared revenue, for each cost item, in columns (2) through (6). The sample is restricted to firms with electronic declarations between 2015-2017 and exclude approximately 3% of firms for which the sum of claimed deductions computed from individual cost lines does not match total claimed deductions. We also trim the sample at the first and 99th percentile of declared profit margin distributions. Robust standard errors are presented in parenthesis.

Table 7: Simulated impact of counterfactual minimum tax policies

Exemption Threshold (L million)	Minimum tax rate (%)	Share taxpayers owing MT (%)	Tax revenue increase (%)	Tax liability change for MT firms (%)	Change aggregate profits (%)	% tax paid by bunchers	Tax loss from bunchers (%)
10	1.5	62.4	30.3	122.5	-10.0	23.8	1.0
10	0.5	28.0	3.6	94.5	-0.5	17.4	0.5
10	2.0	70.6	49.2	146.8	-17.4	24.0	1.3
20	0.5	16.5	3.3	92.9	-0.5	23.6	0.3
20	1.5	36.4	27.7	120.7	-9.1	30.1	1.2
20	2.0	40.6	45.1	144.8	-16.0	23.7	1.5
50	0.5	7.4	2.6	88.7	-0.4	22.7	1.5
50	1.5	17.1	22.8	117.3	-7.6	30.0	2.4
50	2.0	18.5	36.9	141.2	-13.2	25.6	3.3

Note: This table presents results of counterfactual minimum tax policies using the calibrated model. Columns (1) and (2) present the counterfactual notch above which the firms are subject to the minimum tax and the tax rate applied on gross revenue, respectively. Column (3) presents the share of taxpayers with revenue above the exemption threshold paying minimum taxes; column (4) presents the increase in collected tax revenue; column (5) presents the aggregate increase in tax liability faced by firms paying the minimum tax; column (6) presents the change in aggregate corporate profit; column (7) presents the ratio between total tax liability below and above the exemption threshold for bunchers; and column (8) presents the share of total potential revenue collected under minimum tax that is lost from bunching taxpayers.

Table 8: Simulated impact of counterfactual increase in average profit tax

Average profit tax rate (%)	Tax revenue increase (%)	Change aggregate profits (%)
30	12.2	-6.9
35	22.2	-13.5
40	29.9	-20.0
45	35.9	-26.3
50	39.3	-32.5

Note: This table presents results of counterfactual policies where the average profit tax rate is increased for firms declaring gross revenue above L10 million, using the calibrated model. Columns (1) presents the average profit tax rate simulated in each scenario. Column (2) presents the total % increase in tax collection while column (3) presents aggregate profit losses.

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A Appendix Graphs and Table

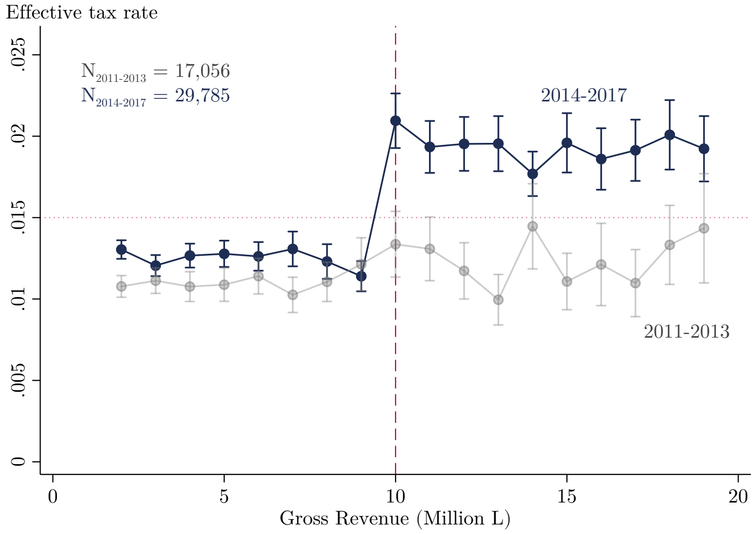
Figure A1: Taxes as percentage of GDP across countries

(a) Tax revenue

(b) Corporate income tax revenue

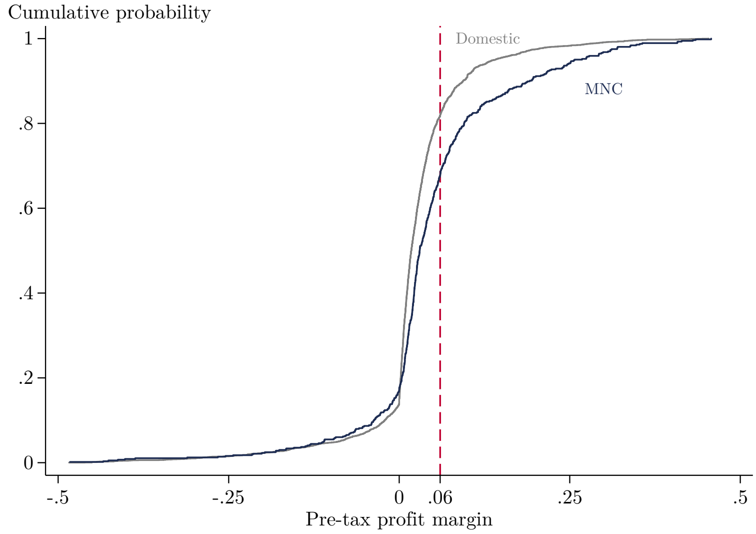
Note: These figures plot countries' tax revenue (Panel A) and corporate income tax revenue (Panel B) as percentage of GDP vs. (log) per capita GDP in 2016. Per capita GDP is expressed in PPP current dollars. Source: (World Bank 2020) and IMF's World Revenue Longitudinal Data (International Monetary Fund 2016).

Figure A2: Average effective tax rate across declared revenue distribution



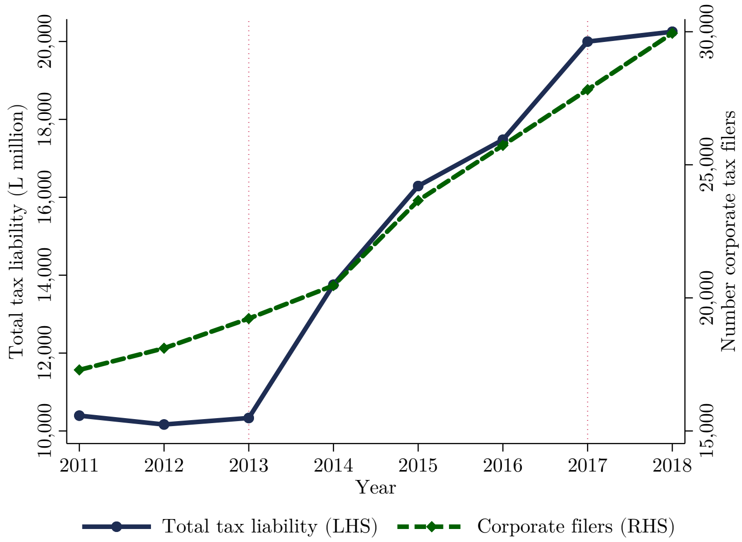
Note: This figure presents mean and 95% confidence intervals of the effective tax rate, defined as the ratio between taxes due and gross revenue, for each bin of declared gross revenue. It documents that the minimum tax increased effective tax rates for corporations declaring more the L10 million: the average effective rate increases by approximately 1 p.p. around the threshold in 2014-2017, with no equivalent variation in 2011-2013, before the policy was introduced. Bins are L1 million wide. Sample is restricted to taxpayers declaring between L2-20 million and effective rate is trimmed at 99th percentile. The blue line refers to the pooled sample of taxpayers in 2014-2017, when the minimum tax was in place, while the gray line refers to the pooled sample of 2011-2013, before the introduction of the policy.

Figure A3: Pre-tax profit margin CDF - Domestic vs. Multinational corporations



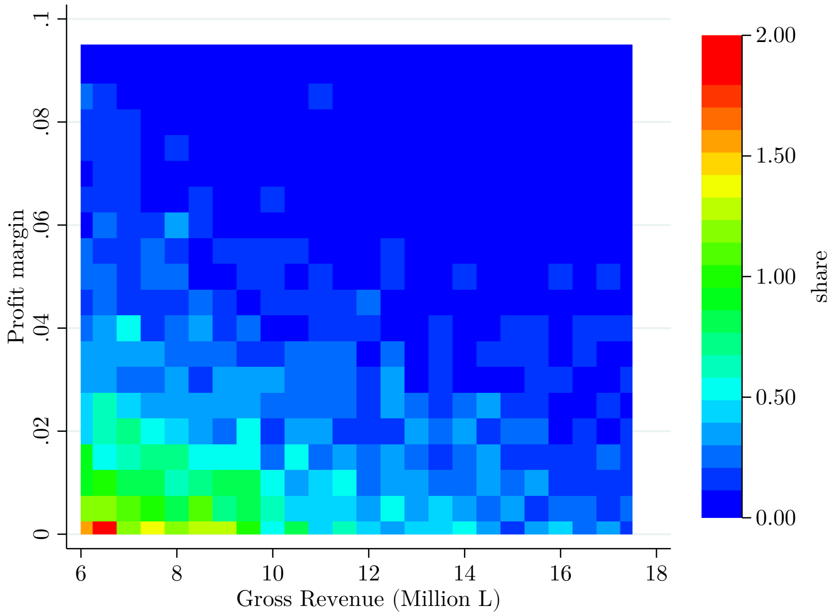
Note: This figure presents the cumulative distribution functions (CDF) of pre-tax profit margins by domestic and multinational firms in 2013, before the introduction of the minimum tax. The CDF of MNCs is shifted to the right, indicating higher declared profit margin across the distribution. In particular, approximately 30% of MNC declared profit margins above the 6% threshold that separates the minimum tax and profit regimes in 2014-2017, while this number is less than 20% for domestic corporations. MNCs are defined as taxpayers that present transfer pricing declarations at some point in 2014-2018. The sample is restricted to taxpayers declaring at least L8 million in gross revenue and the distribution is trimmed at the 1st and 99th percentiles.

Figure A4: Total corporate tax liability and number of filers

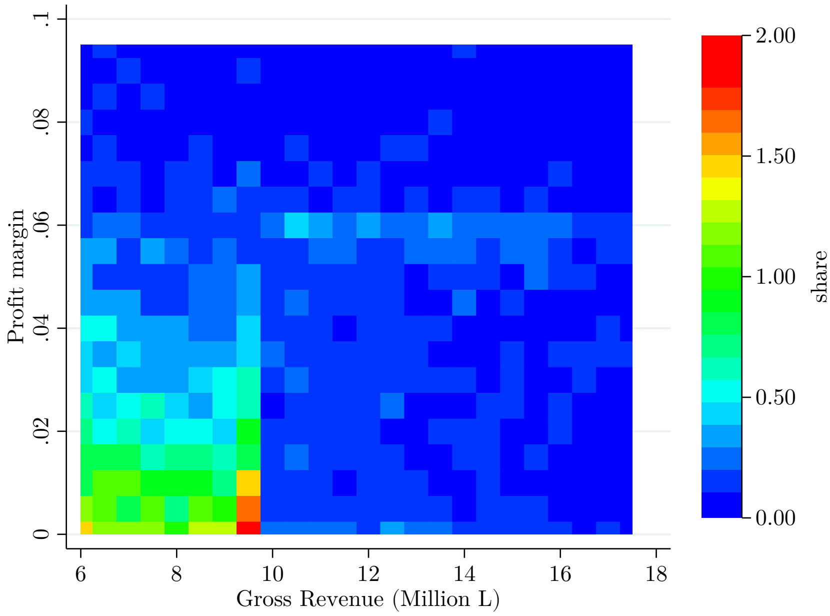


Note: This figure presents, for each year in the period 2011-2018, the total number of corporate tax filers in our sample and the total tax liability. It documents the very significant increase in aggregate tax liability between 2013 and 2014, when the minimum tax was introduced. The sample excludes taxpayers exempt from all income taxes.

Figure A5: Heatmap of corporations on Revenue vs. Profit margin space



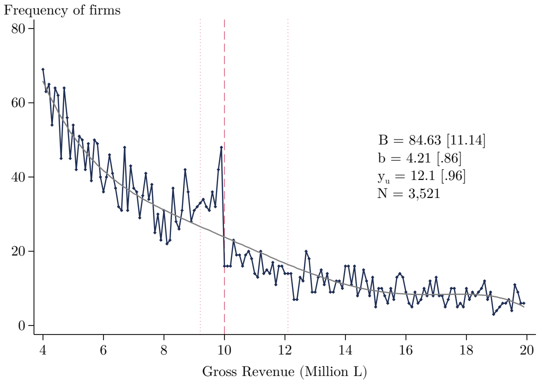
(a) 2011-2013 (before minimum tax)



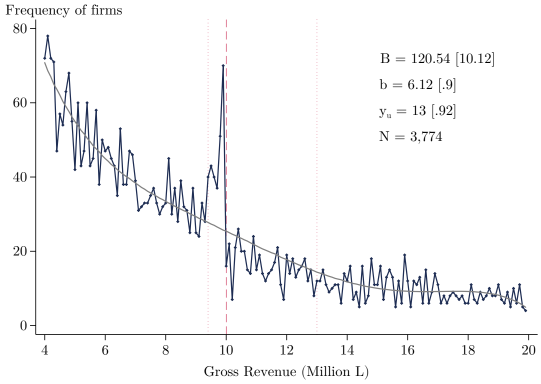
(b) 2014-2017

Note: These figures present heatmaps of the empirical distribution of corporations according to declared gross revenue (x-axis) and profit margin (y-axis). Panel A refers to the period 2011-2013, before the introduction of the minimum tax, while panel B refers to 2014-2017, while the minimum tax was in place with a L10 million exemption threshold. These figures summarized the response of firms to the minimum tax. First, we observe an increase in the number of firms reporting revenue immediately below the L10 million exemption threshold. Second, for firms declaring revenue significantly above that level we observe an increase in declared profit margins around the 6% level, which separates the revenue and profit taxation regimes. Bins are L500,000 wide for revenue and 0.5 p.p. wide for profit margin.

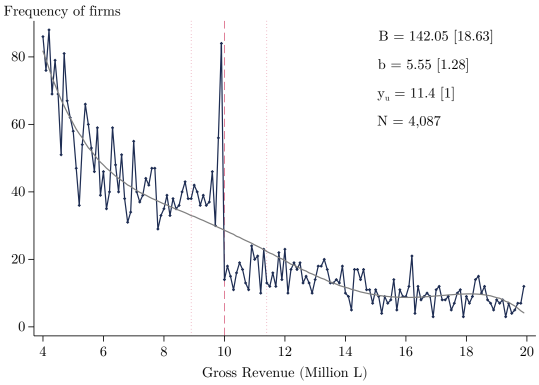
Figure A6: Empirical Density of Gross Revenue around L10 million threshold



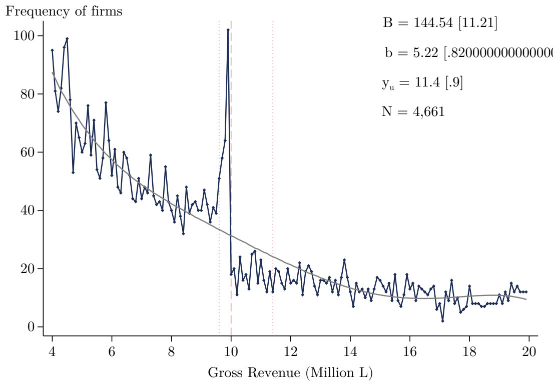
(a) 2014



(b) 2015



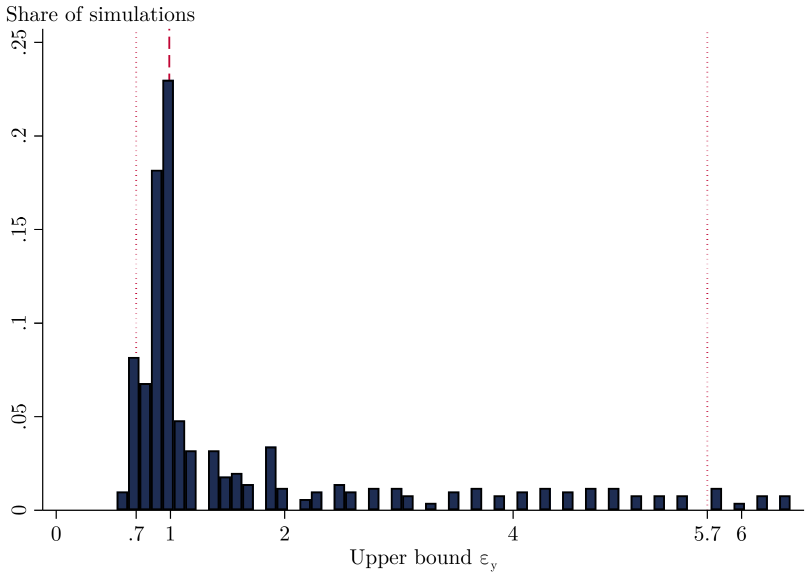
(c) 2016



(d) 2017

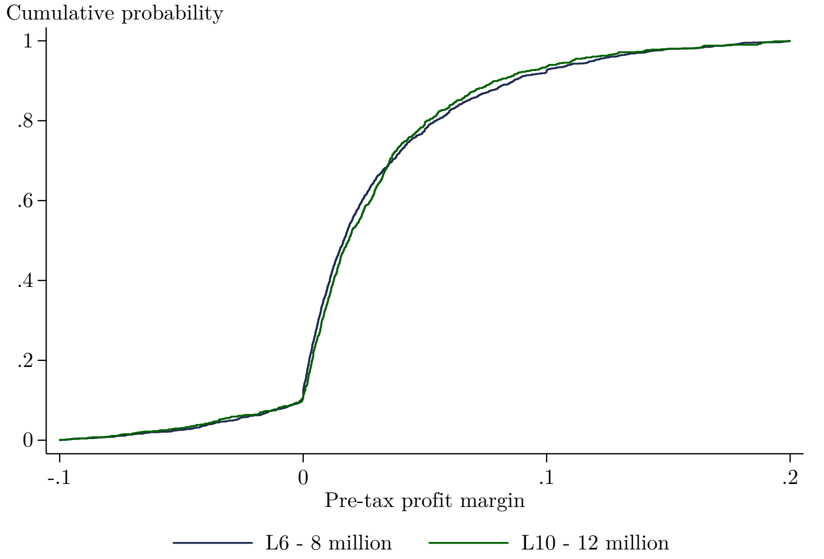
Note: These figures present empirical and counterfactual densities of declared gross revenue for each year in the period 2014-2017. The lower bound of the bunching region is chosen visually while the upper bound is obtained using the convergence method discussed in Section 4.3. The dashed line marks the L10 million notch while the dotted lines mark the lower and upper bounds of the bunching region. For each year we present the excess mass below the notch (B), the excess mass as a share of the predicted mass in the bunching region (b), the upper bound obtained from the convergence method (y_u) and the underlying number of taxpayers in each figure (N). Standard errors in brackets are obtained through bootstrapping. Bins are L100,000 wide.

Figure A7: Histogram of revenue elasticity bootstrap estimate for pooled sample (2014-2017)



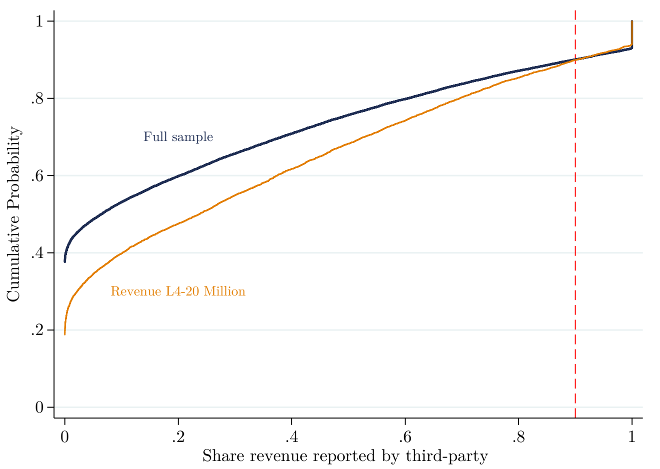
Note: This figure presents the histogram of 500 bootstrap estimates for the upper bound elasticity using the pooled sample of corporation filing in 2014-2017. The dashed line marks the point estimate of $\epsilon_y = 0.99$, while the two dotted lines mark percentiles 2.5 and 97.5 of the distribution. The empirical 95% confidence interval is $[0.7, 5.7]$. Bins are 0.1 wide.

Figure A8: CDF of profit margin for different revenue ranges



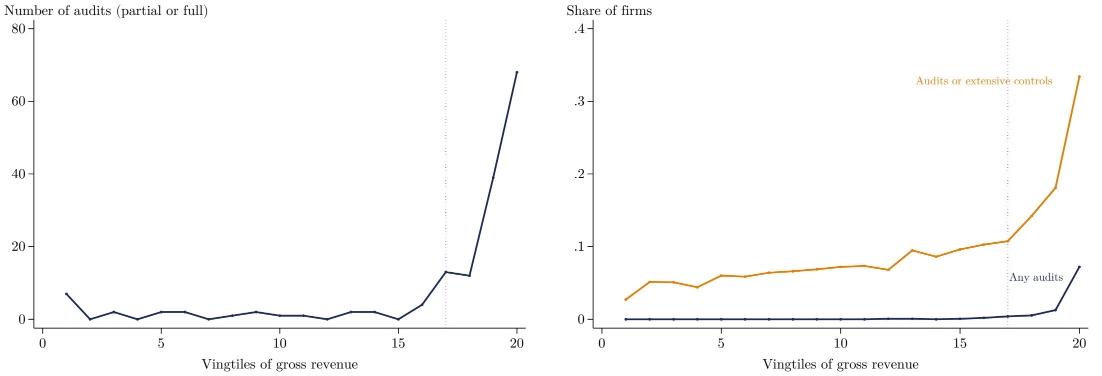
Note: This figure presents cumulative distribution functions (CDFs) of profit margins in 2011-2013, for corporations reporting gross revenues between L6 - 8 million and between L10-12 million. The distributions are trimmed at -10% and 20%. The profit margin distributions are similar across different revenue levels, suggesting the assumption used to estimate the lower bound revenue elasticity (using profit margin distribution below the L10 million notch as the counterfactual distribution above the notch) is reasonable.

Figure A9: Share of revenue reported by third-parties



Note: This figure presents cumulative distribution functions (CDF) for the share of self-declared revenue that is also independently reported by third-parties. The sample is restricted to tax filers in 2018 and CDFs are presented separately for the entire sample (blue) and for those taxpayers declaring revenue in the vicinity of the L10 million threshold (L4 - 20 million) (orange). The dashed line shows that, in both samples, only 10% of taxpayers have 90% of more of their self-declared revenue independently reported by third-parties. For 40% of the total sample and 20% of the larger firms, no third-party reports are available.

Figure A10: Enforcement actions across revenue distribution

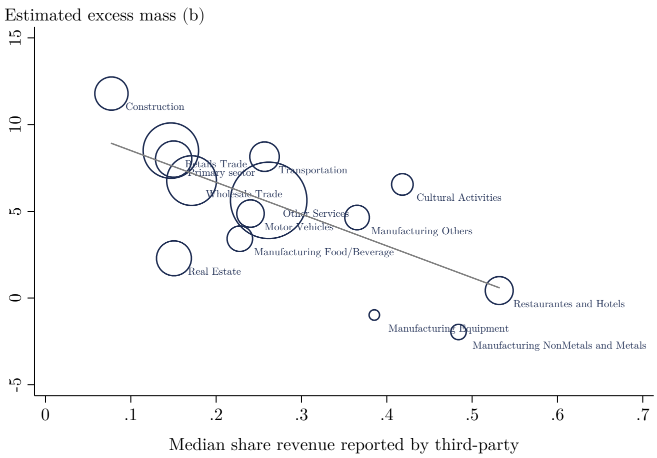


(a) Number of audits per vingtile of corporate revenue (2014)

(b) Share of firms receiving enforcement actions per vingtile of revenue (2018)

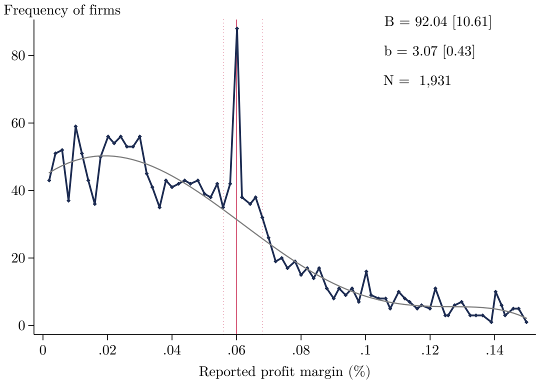
Note: These figures document the relationship between enforcement actions and firms' size. In panel (a) we compute the number of full or partial audits by gross revenue vingtile in 2014, while in panel (b) we compute the share of firms in each vingtile that faced an audit (blue line) or any kind of enforcement action (audit or extensive controls) (orange line) in 2018. The dotted line marks the 80th percentile of the size distribution, which approximately coincides with the L10 million exemption threshold for the minimum tax policy in 2014-2017.

Figure A11: Scatter plot of amount of bunching vs. revenue observability across industries - alternative sectoral definition

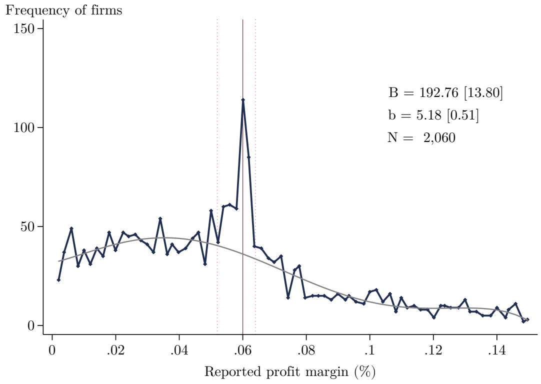


Note: This figure presents a scatter plot of estimated excess mass at the L10 million threshold and the median share of self-reported revenue also informed by third parties in each industry. Excess mass is defined as the excess number of firms bunching at the L10 million notch as a ratio of the predicted mass at the notch. The share of reported revenues is calculated in 2018, for firms declaring gross revenues in the interval L5-15 million. The size of markers is proportional to the reported sales in 2018 by industries. Industries are defined to approximate the same sectoral definition as in Almunia and Lopez-Rodriguez (2018).

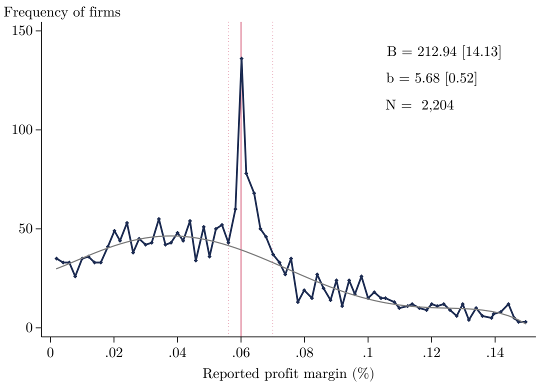
Figure A12: Empirical Density of profits around 6% threshold



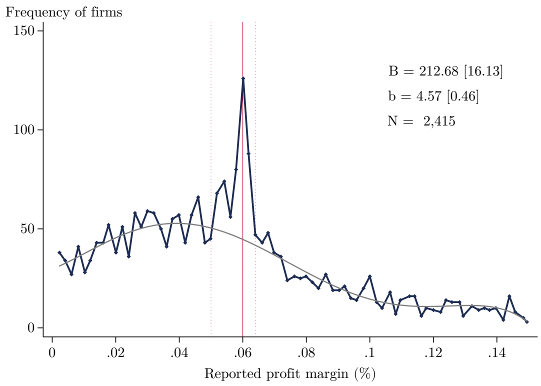
(a) 2014



(b) 2015



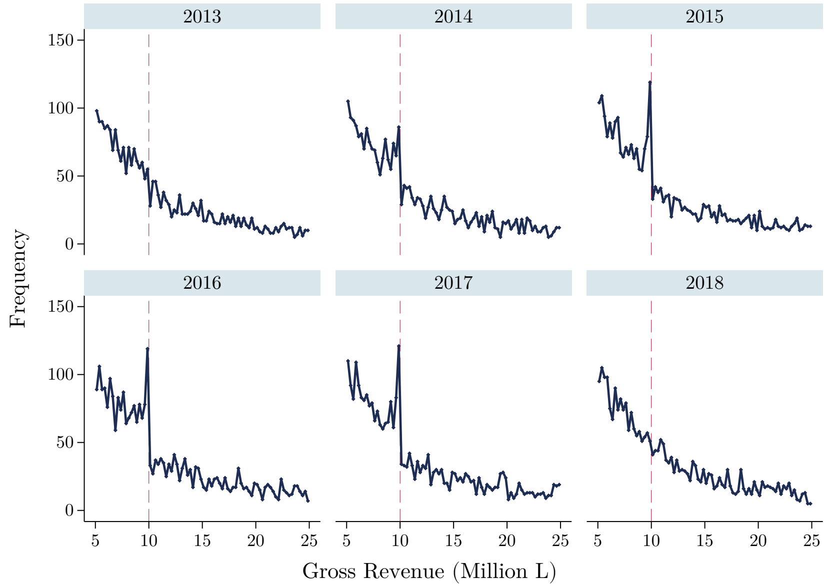
(c) 2016



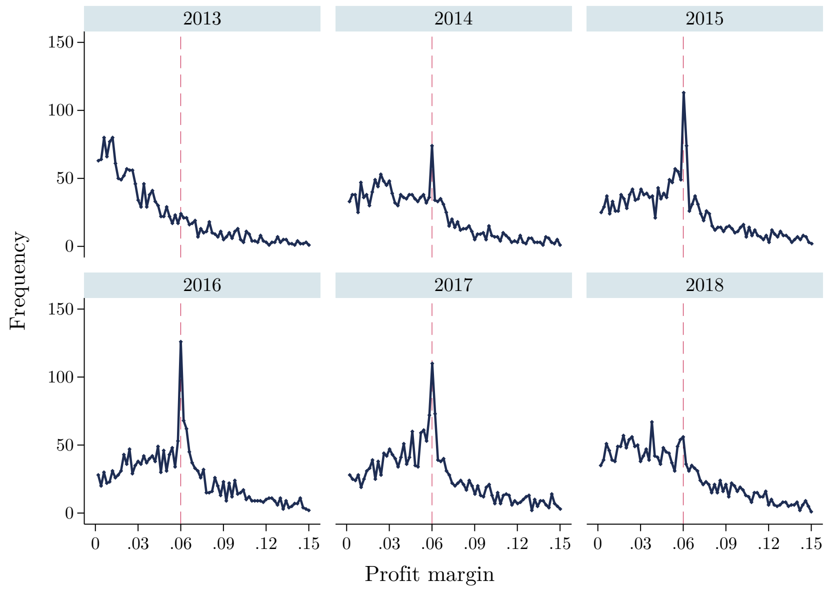
(d) 2017

Note: These figures present the empirical and estimated counterfactual distributions of profit margins for each year in the period 2014-2017. The lower and upper bounds of the bunching region are determined visually. The solid red line marks the 6% kink while the dotted lines present the lower and upper bounds of the bunching region. For each year we present the excess mass around the kink (B), the excess mass as a share of predicted density around the kink (b) and the underlying number of taxpayers in each figure (N). Standard errors in brackets are obtained through bootstrapping. Bins are 0.2 percentage points wide and the first bin starts at 0.1%, such that the 6% kink is the midpoint of a bin.

Figure A13: Robustness: Balanced panel of corporations (2013-2018)



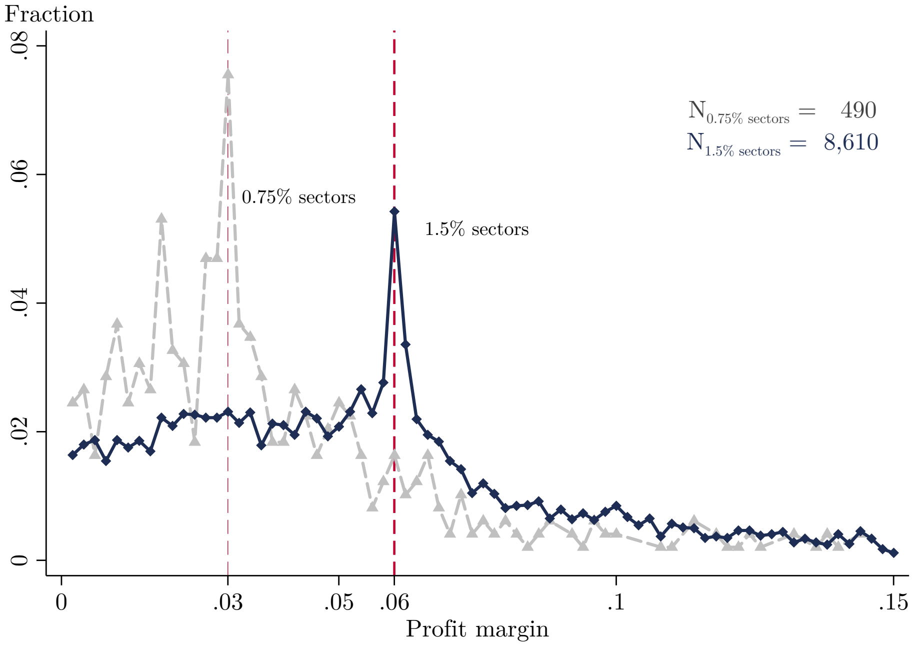
(a) Gross revenue empirical density



(b) Profit margin empirical density

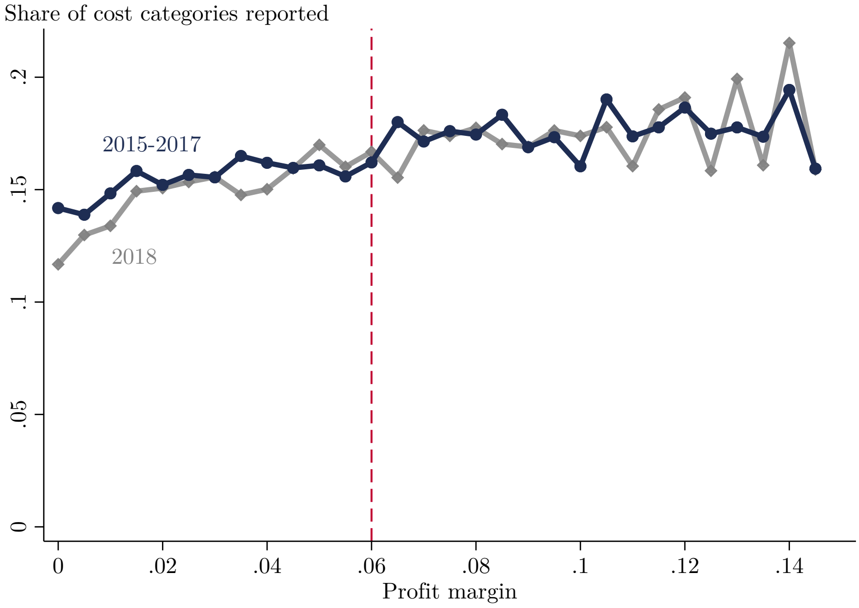
Note: This figure presents the empirical density of gross revenues (Panel A) and profit margins (Panel B) for a balanced panel of 12,172 firms, for each year in the period 2013-2018. It documents the same pattern observed for the full sample. Panel A shows a smooth distribution of gross revenue around the L10 million notch in 2013 and 2018, but significant excess mass between 2014-2017. This is evidence that taxpayers respond to the minimum tax by strategically bunching below the exemption threshold. Panel B shows that taxpayers liable for the minimum tax increase their reported profit margin and bunch around a 6% margin, which separates the minimum tax and profit taxation regimes. Bins are L250,000 wide in Panel A and 0.2 p.p. wide in Panel B. The sample in Panel B is restricted to firms reporting gross revenue above L13 million in each year.

Figure A14: Empirical Density around 6% profit margin threshold - 0.75% vs. 1.5% sectors (2014-2017)

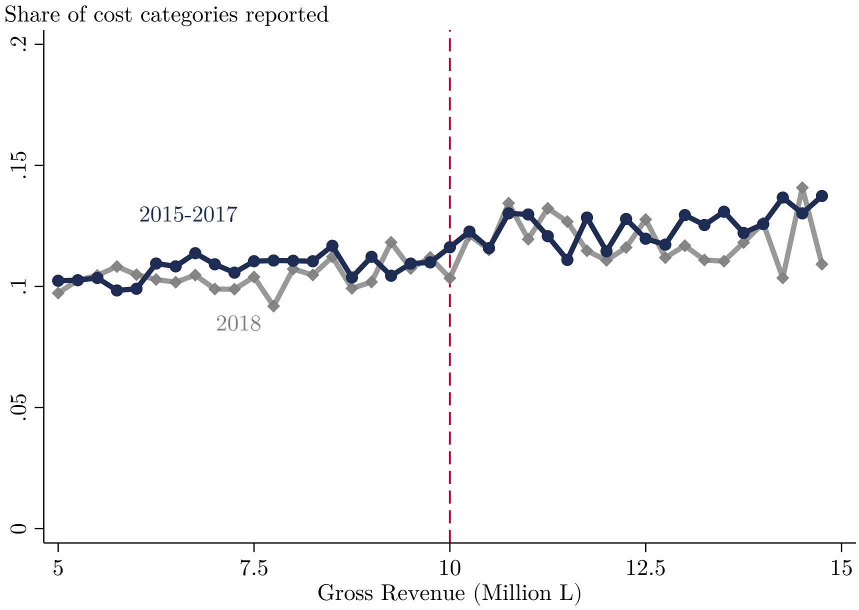


Note: This figure presents the empirical density of reported profit margins for firms subject to the 1.5% minimum tax (in solid blue) and those in sectors subject to the 0.75% rate (in dashed gray) for the period 2014-2017. The sample is restricted to firms reporting revenue above L13 million (infra marginal to revenue bunching). Bins are 0.2 p.p. wide and the first bins starts at 0.1% such that the 6% kink is the midpoint of a bin.

Figure A15: Average number of cost categories with positive deduction



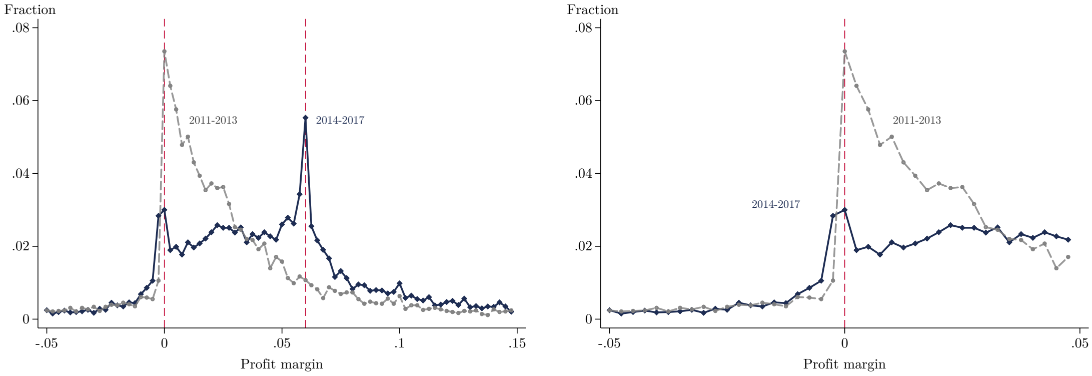
(a) Around 6% profit margin kink



(b) Around L10 million notch

Note: This figure presents the average share of all cost categories reported by taxpayers in each bin. Panel (a) restricts the sample to taxpayers reporting revenue above L12 million and therefore infra-marginal to the revenue bunching behavior. Profit margin bins are 0.5% wide. The blue line represents declarations in the period 2015-2017, when the minimum tax affected a large number of taxpayers, while the gray line refers to declarations in 2018, when only a small subset of corporations were affected by the minimum tax. Panel (b) compares the usage of cost categories across the reported gross revenue distribution, for the period 2015-2017 (blue) and 2018 (gray). Both panels restrict the sample to taxpayers filing electronically, for which detailed cost categories are available.

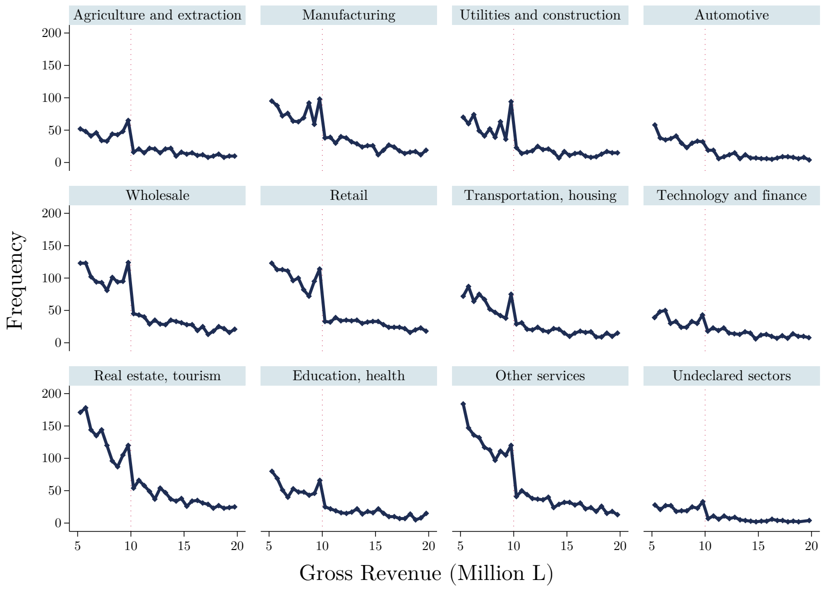
Figure A16: Distribution of profit margins



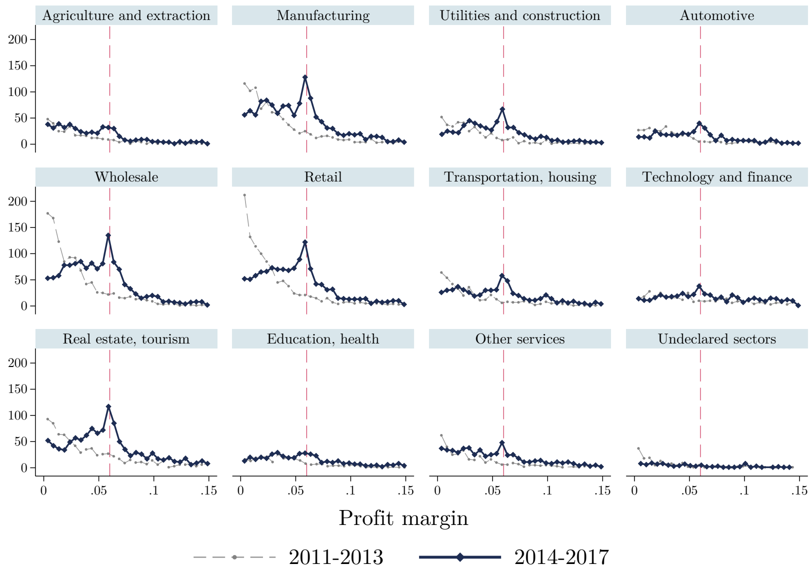
(a) Profit margin distribution - including losses (b) Profit margin distribution - Zooming on losses

Note: These figures present the distribution of claimed profit margins for firms with revenue above L13 million, for the periods before (2011-2013) and after (2014-2017) the introduction of the corporate minimum tax.

Figure A17: Robustness: Behavioral responses by economic sector



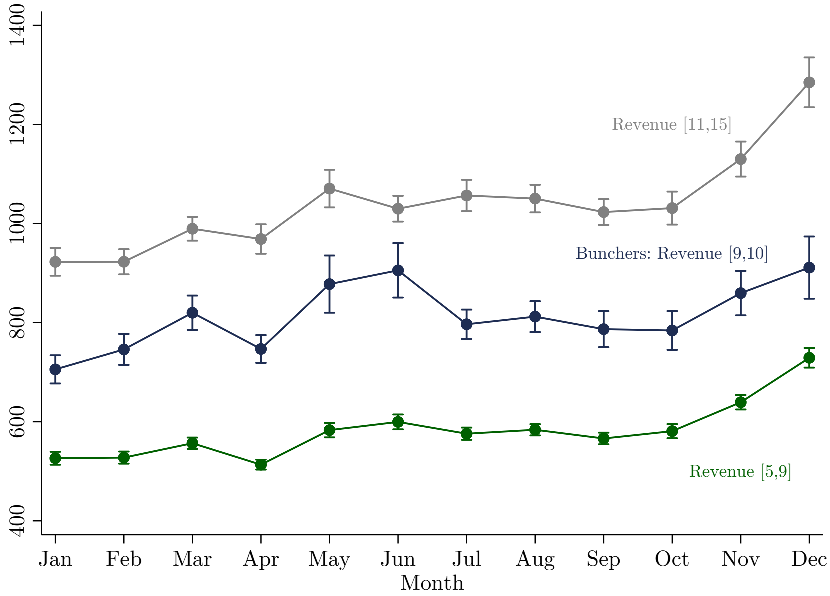
(a) Gross revenue empirical density



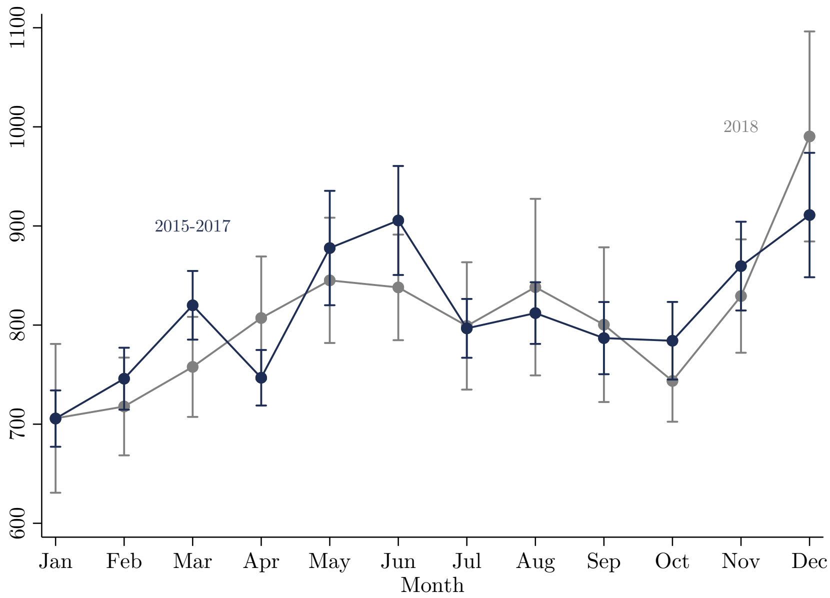
(b) Profit margin empirical density

Note: This figure presents the empirical density of gross revenues (panel A) and profit margins (Panel B) for firms in different economic sector for the period 2014-2017 pooled. Panel A documents that bunching below the notch is observed, in different degrees, for firms in the majority of sectors. Panel B shows that before the introduction of the minimum tax (2011-2013) the profit margin distribution is smooth around the 6% kink and presents a steep negative slope. With the introduction of the minimum taxation, the distribution shifts to the right and present excess mass around the kink. Bins are L500,000 wide in Panel A and 0.5 p.p. wide in Panel B. The sample in Panel B is restricted to firms reporting revenue above L13 million (infra marginal to the revenue bunching).

Figure A18: Monthly sales for firms with different yearly gross revenue



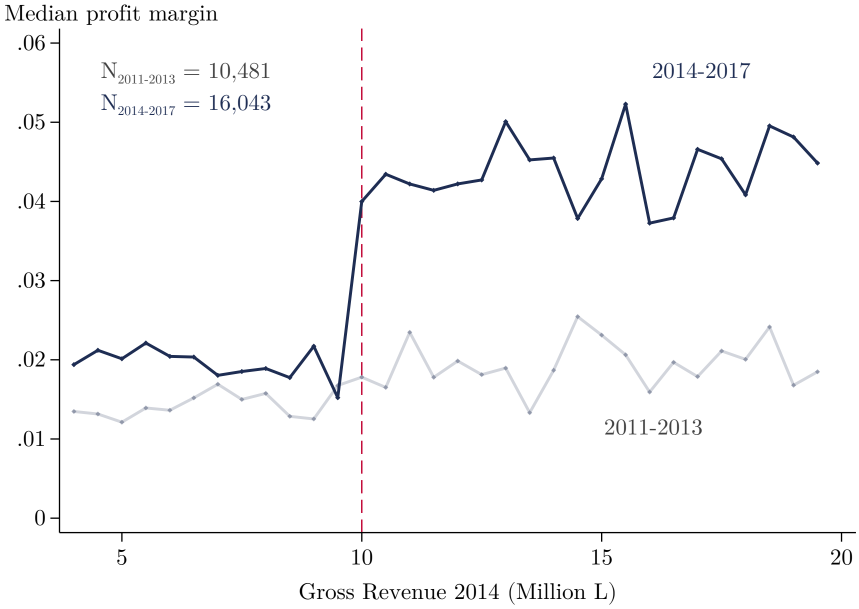
(a) 2015-2017 - Around L10 million notch



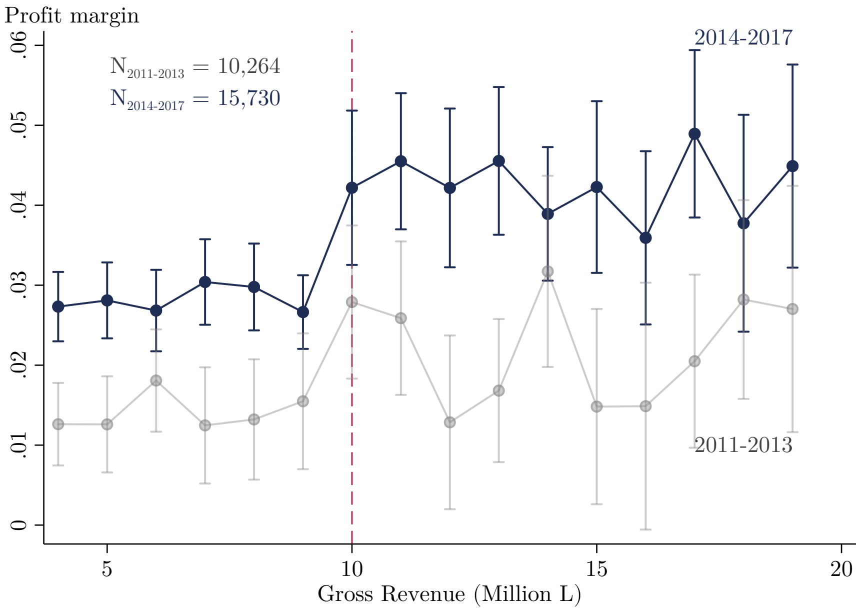
(b) 2015-2017 vs. 2018 - Below notch

Note: This figure presents average and 95% CI monthly sales separately for firms declaring gross revenue in L5-9 million, L9-10 million and L11-15 million bins on period 2015-2017 (Panel A), and for firms declaring gross revenue between L9-10 million in 2015-2017 and 2018. The sample is restricted to firms filing both monthly sales taxes and yearly income taxes and only include firm-year observations for which the total amount of monthly revenue falls within 5% of the total revenue declared in the yearly Income Tax Declaration,

Figure A19: Reported profit margin by gross revenue



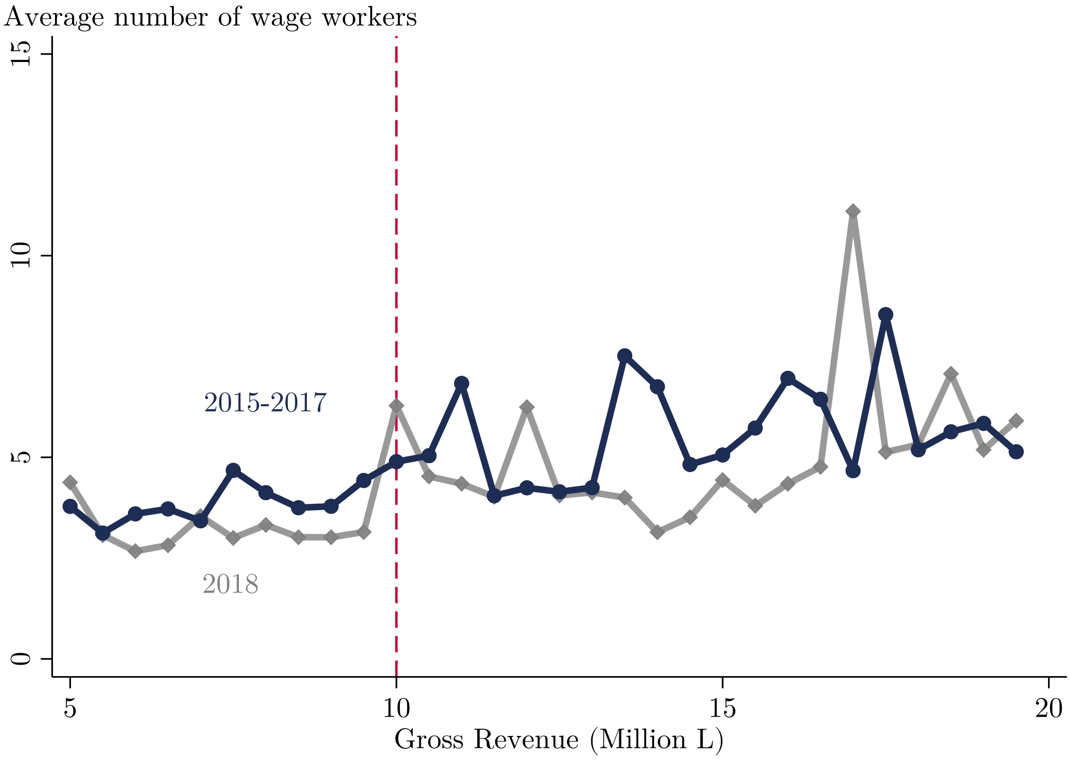
(a) Median profit margin



(b) Average profit margin

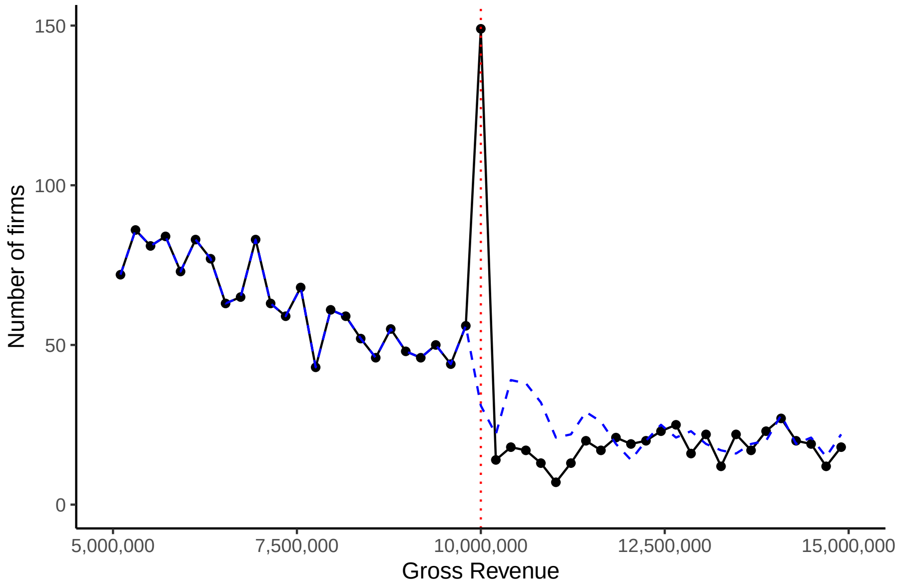
Note: This figure presents median (Panel A) and average with 95% CI (Panel B) reported profit margins by firms in two groups: 2011-2013, before the introduction of the minimum tax, and 2014-2017, then the minimum tax was in place for corporations with gross revenue above L10 million. The figure illustrates that corporations liable for the minimum tax increase their reported profit margins, consistent with the disappearance of the incentive to over report deductions in order to minimize tax liability. Bins are L500,000 wide in Panel A and L1 million in Panel B. Profit margins are trimmed at the 1st and 99th percentiles in Panel B.

Figure A20: Average number of wage workers by gross revenue (2015-2017 vs. 2018)



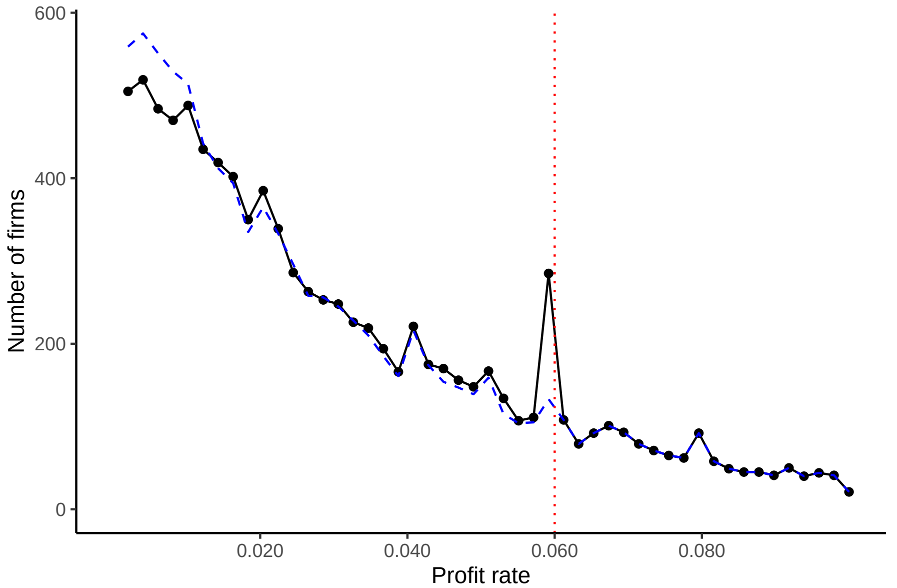
Note: This figure presents the average number of wage workers for firms in each gross revenue bin in 2015-2017 (when the exemption threshold was L10 million) and 2018 (when the threshold increased to L300 million). The number of wage workers is computed as the number of unique individuals for which the firm withheld taxes on wages. Firms are not required to withhold taxes if the total amount paid is below the exemption threshold for non-incorporated individuals, so these estimates of number of workers should be interpreted as lower bounds. The sample is limited to firms declaring at least one employee withholding (between 50-60% of firms declaring gross revenue above L5 million).

Figure A21: Calibrated model - bunching on L10 million revenue notch



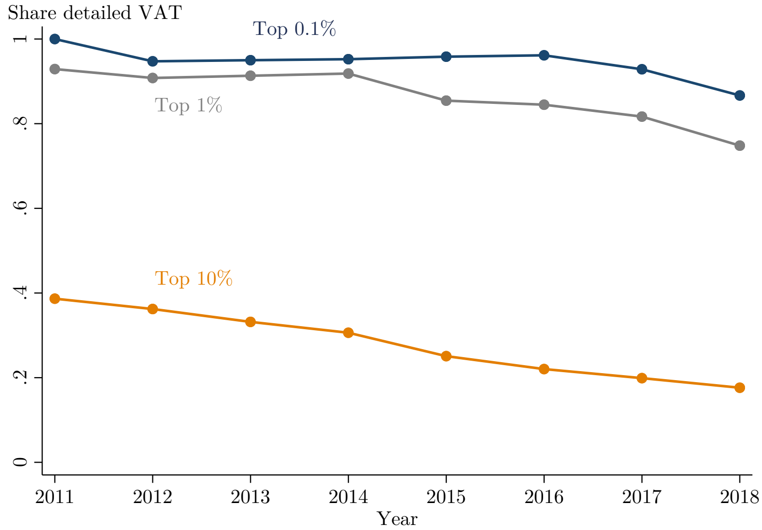
Note: This figure presents the density of simulated gross revenue using our calibrated model. The blue dashed line is the simulated density under profit taxation, while the solid black line presents the density under a Minimum Tax regime in which firms declaring above L10 million are subject to a minimum tax liability equivalent to 1,5% of their declared gross revenue.

Figure A22: Calibrated model - bunching on 6% profit margin kink



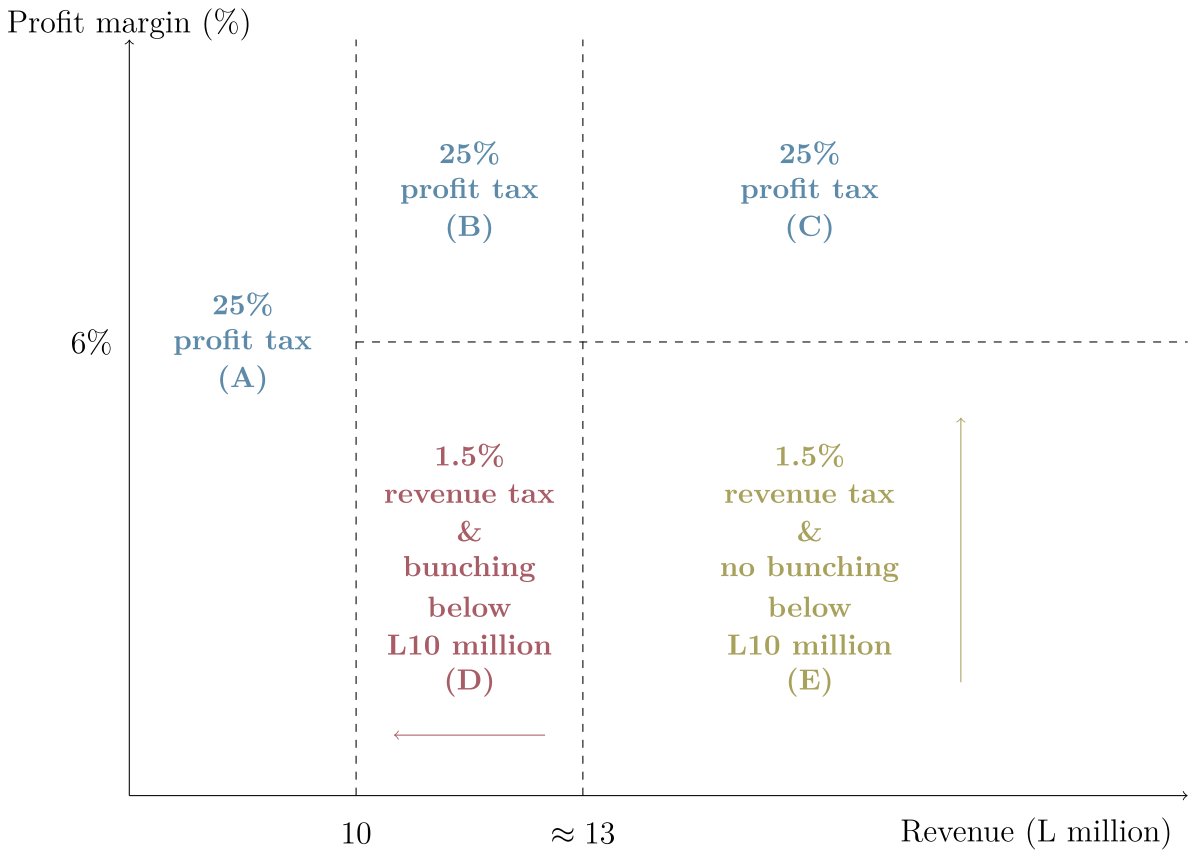
Note: This figure presents the density of simulated profit margin using our calibrated model. The blue dashed line is the simulated density under profit taxation, while the solid black line presents the density under a Minimum Tax regime in which firms declaring above L10 million are subject to a minimum tax liability equivalent to 1,5% of their declared gross revenue. We restrict the simulated sample to firms that choose to declared gross revenue above L12 million and are therefore infra-marginal to the bunching behavior at the notch.

Figure A23: Share of taxpayers mandated to file detailed VAT purchases



Note: This figure presents, for each year in the period 2011-2018, the share of taxpayers in each revenue group (top 0.1%, top 1% and top 10%) that are defined as medium or large. These are the taxpayers with an obligation to file individualized information on their purchases to claim VAT deductions, generating independent information on suppliers' revenues. The list of medium and large taxpayers was defined in 2011 and has not changed since. Groups are mutually exclusive, so the group defined as top 1% exclude taxpayers in the top 0.1% and the 10% group all those in the top 1% and 0.1%. The sample excludes taxpayers exempt from all income taxes.

Figure A24: Summary of minimum tax incentives on Revenue vs. Profit margin space



Note: This figure illustrates the theoretical effects of the minimum tax for firms that would have declared different combinations of gross revenue and profit margins. Corporations declaring gross revenue below L10 million (A) are exempt from the minimum tax, so are taxed on profits. Firms with revenue above L10 million but that would have declared profit margins above 6% (B and C) are not affected by the minimum tax either, since their effective tax rate (tax liability divided by revenue) is above 1.5% and they still pay taxes on their declared profits. Firms that would have declared revenue above L10 million and profit margin below 6% (D), on the other hand, will face the choice between i) reducing reported revenue below L10 million to avoid the minimum tax (bunching) or ii) stay above the exemption threshold and adjust to the fact they are taxed on revenues and not profit. Finally, firms declaring revenue significantly above L10 million and profit margin below 6% (E) are too large to bunch below the exemption threshold. Faced with revenue taxation, they will i) reduce reported revenue and ii) decrease reported costs, since incentives to misreport disappear. Both changes will lead to higher declared profit margins, creating an excess mass of firms declaring margins around the 6% threshold.

Table A1: Alternative order of polynomial - gross revenue distribution

	(1) Excess # Firms (B)	(2) Firms % counterfactual (b)	(3) y_u (upper bound)	(4) Δ Revenue (upper bound)	(5) ϵ_y (upper)	(6) ϵ_y (lower)
Order p = 3	604.30	8.82	14.70	4.70	5.96	0.60
	(33.71)	*(0.74)*	*(0.75)*	*(0.75)*	*(1.45)*	*(0.09)*
Order p = 4	569.91	6.78	12.90	2.90	2.45	0.50
	(31.09)	*(0.57)*	*(0.60)*	*(0.60)*	*(1.08)*	*(0.06)*
Order p = 6	494.55	5.69	12.30	2.30	1.58	0.35
	(26.11)	*(0.62)*	*(0.75)*	*(0.75)*	*(1.22)*	*(0.04)*

Note: This table presents results from replicating the exercises performed in Table 3 using different order of polynomials to estimate the counterfactual distribution of gross revenue for the sample of pooled taxpayers in 2014-2017. The baseline specification uses polynomial regression of order five, while in this table we present results using polynomials of order three, four and six.

Table A2: Number of enforcement actions per year

	Partial Audit (1)	Full audits (2)	Extensive (3)	Any control (%) (4)
2011	0	140		
2012	3	108		
2013	0	41		
2014	1	157		
2015	2	66		
2016	0	5		
2017	15	12	1,039	3.8
2018	98	50	2,672	9.2

Note: This table presents the number of partial audits (1), full audits (2), extensive controls (3) and the share of taxpayers receiving any of those enforcement actions per year. The numbers refer to taxpayer in the sample of corporations used in this paper.

Table A3: Alternative order of polynomial - Profit margin distribution

Year	(1) Excess Mass (B)	(2) Bunching(b)	(3) Delta Profit	(4) Estimated evasion ($\epsilon_{\mathrm{y}} = 0.99$)
Order p = 3	779.64	5.38	1.10	-16.85
	(48.23)	*(0.41)*	*(0.10)*	*(1.48)*
Order p = 4	834.22	6.05	1.20	-18.52
	(43.07)	*(0.40)*	*(0.10)*	*(1.42)*
Order p = 6	788.99	5.49	1.10	-16.85
	(41.19)	*(0.38)*	*(0.10)*	*(1.36)*

Note: This table presents results from replicating the exercises performed in Table 5 using different order of polynomials to estimate the counterfactual distribution of profit margin for the sample of pooled taxpayers in 2014-2017. The baseline specification uses polynomial regression of order five, while in this table we present results using polynomials of order three, four and six.

Table A4: Estimated responses at the kink (Robustness - output evasion)

Year	(1) Delta Profit ($\Delta\Pi$)	(2) ($\epsilon_{\mathrm{y}} = 0.5$)	(3) Estimated evasion ($\epsilon_{\mathrm{y}} = 0.99$)	(4) ($\epsilon_{\mathrm{y}} = 2$)
2014	0.60	-9.68	-8.74	-6.81
	(0.10)	*(1.61)*	*(1.61)*	*(1.61)*
2015	1.00	-16.77	-15.83	-13.90
	(0.10)	*(1.89)*	*(1.89)*	*(1.89)*
2016	1.10	-18.55	-17.61	-15.67
	(0.10)	*(1.88)*	*(1.88)*	*(1.88)*
2017	0.90	-15.00	-14.06	-12.13
	(0.10)	*(1.70)*	*(1.70)*	*(1.70)*
Pooled	1.10	-18.55	-17.61	-15.67
	(0.10)	*(1.55)*	*(1.55)*	*(1.55)*

Note: Note: This table presents estimates of change in reported profit margins and evasion estimates for each year in the period 2014-2017 and also for all years pooled. Column (1) presents estimated change in profit margins while columns (2) through (4) computes the estimated output evasion under different real elasticity (ϵ_y) scenarios.

Table A5: Cost evasion responses across economic sectors

Year	(1) Excess Mass (B)	(2) Bunching(b)	(3) Delta Profit	(4) Estimated evasion ($\epsilon_y = 0.99$)
Agriculture and extraction	38.35	6.06	1.20	-18.52
	(9.93)	*(2.11)*	*(0.40)*	*(7.16)*
Manufacturing	153.10	7.86	1.60	-25.18
	(15.93)	*(1.26)*	*(0.30)*	*(4.25)*
Utilities and construction	61.86	5.55	1.10	-16.85
	(9.43)	*(1.14)*	*(0.20)*	*(3.82)*
Automotive	49.72	7.91	1.60	-25.18
	(6.67)	*(1.61)*	*(0.30)*	*(5.42)*
Wholesale	132.19	5.66	1.10	-16.85
	(14.20)	*(0.81)*	*(0.20)*	*(2.76)*
Retail	85.16	3.71	0.70	-10.18
	(10.88)	*(0.57)*	*(0.10)*	*(1.95)*
Transportation, housing	69.39	8.09	1.60	-25.18
	(9.15)	*(1.71)*	*(0.30)*	*(5.79)*
Technology and finance	28.68	3.80	0.80	-11.85
	(6.42)	*(1.07)*	*(0.20)*	*(3.56)*
Real estate, tourism,other	93.89	4.15	0.80	-11.85
	(11.98)	*(0.66)*	*(0.10)*	*(2.20)*
Education, health, entertainment	31.71	4.59	0.90	-13.52
	(6.92)	*(1.28)*	*(0.30)*	*(4.18)*
Other services	34.21	4.04	0.80	-11.85
	(7.61)	*(1.10)*	*(0.20)*	*(3.77)*
Undeclared sectors	-1.93	-1.11	-0.20	4.82
	(4.39)	*(2.51)*	*(0.50)*	*(8.37)*

Note: This table presents estimates of change in reported profit margins and cost evasion for firms by economic sector, pooled for the 2014-2017 period. The first column reports the estimated excess number of firms (B) while column (2) reports the ratio between excess mass and average counterfactual density in the bunching region (b). Column (3) presents estimated change in profit margin, while column (4) present changes in cost misreporting using the decomposition in Equation 13.

B Approximating the elasticity with notch

In this section we adapt the exercise of Kleven and Waseem (2013) and Kleven (2018) to obtain the elasticity formula when taxpayers face a notch instead of a kink. The intuition behind the derivation is that we try to recover what would have been the kink that would "replicate" the same behavior observed with the notch. We start by considering the average slope of the indifference curve of the marginal buncher: this IC is tangent to the threshold using the hypothetical kink with slope $(1-\tau^*)$ and has slope of $(1-t_0-\Delta t)$ at the point $y^t+\Delta Y$. In our case, $t_0=0$ since the effective marginal rate on revenue is zero below the threshold, and $\Delta t=\tau_y=0.015$. We can write

$$\frac{\int_{y^T}^{y^t+\Delta Y} I'(y)dy}{\Delta Y} \approx \frac{I'(y^T)+I'(y^t+\Delta Y)}{2} = \frac{(1-\tau^*)+(1-t-\Delta t)}{2} = \frac{(1-\tau^*)+(1-\tau_y)}{2}$$

The implicit tax rate faced by corporations is the change in tax liability when we change the reported revenue from above the threshold to exactly at the notch:

$$\begin{aligned} t^* = \frac{T(y^t+\Delta Y)-T(y^T)}{\Delta Y} &= \frac{\tau_y(y^t+\Delta Y)-\tau_\pi(y^T-\hat{c})}{\Delta Y} \\ &= \tau_y + \frac{\tau_y y^T+\tau_\pi(y^T-\hat{c})}{\Delta Y} \end{aligned}$$

Combining the fact that we have these two approximations to the slope of the IC in that region, and that $\Delta t = 0.015 = \tau_y$, we can write:

$$\begin{aligned} 1-t^* &= \frac{(1-\tau^*)+(1-\tau_y)}{2} \\ \tau^* &= \tau_y + 2\left(\frac{\tau_y Y^T+\tau_\pi\left(y^T-\hat{c}\right)}{\Delta Y}\right) \end{aligned}$$

Plugging in the expression for τ^* in the usual expression for obtaining revenue elasticity when facing changes in marginal taxes we obtain:

$$\epsilon_{y,(1-t)} = \frac{\frac{\Delta Y}{Y^T}}{\frac{\Delta \tau^*}{(1-\tau^*)}} = \frac{\Delta Y}{Y^T}\left(\frac{1-\tau^*}{\tau^* - t_0}\right)$$
$$= \frac{\Delta Y}{Y^T}\left(\frac{1-\tau^*}{\tau_y + 2\left(\frac{\tau_y Y^T - \tau_\pi (Y_T - \hat{c})}{\Delta Y}\right)}\right)$$
$$= \left(\frac{1}{\tau_y\left(2 + \frac{\Delta Y}{Y^T}\right) - 2\tau_\pi \frac{(Y_T - \hat{c})}{Y_T}}\right)\left(\frac{\Delta Y}{Y^T}\right)^2 (1-\tau)$$

Some things are worth noting from this expression. First, for a firm with zero reported profit at the notch ($y^T = \hat{c}$), than the expression above simplifies to

$$\epsilon_{y,(1-\tau)} \approx \left(\frac{\Delta Y}{Y^T}\right)^2 \left(\frac{(1-\tau)}{\Delta \tau}\right)\left(\frac{1}{2 + \frac{\Delta Y}{Y^T}}\right)$$

which is exactly the same expression in Kleven and Waseem (2013). This is the expression we use to calculate the upper bound of elasticities presented in the text, since the taxpayer with highest incentive to bunch has profits only marginally above zero.

Second, note that if profit margin is exactly 6%, then it's true that

$$\tau_y\left(2 + \frac{\Delta Y}{Y^T}\right) - 2\tau_\pi 0.06 = 0.015\left(2 + \frac{\Delta Y}{Y^T}\right) - 2(0.25)0.06 = 0.015 * \frac{\Delta Y}{Y^T}$$

and the elasticity becomes

$$\epsilon_{y,(1-t)} = \left(\frac{1}{\tau_y(2 + \frac{\Delta Y}{Y^T}) - 2\tau_\pi \frac{(Y_T - c)}{Y_T}}\right)\left(\frac{\Delta Y}{Y^T}\right)^2 (1-\tau)$$
$$= \left(\frac{Y^T}{0.015\Delta Y}\right)\left(\frac{\Delta Y}{Y^T}\right)^2 (1-\tau)$$
$$= \left(\frac{\Delta Y}{Y^T}\right)\frac{(1-\tau)}{\tau_y} = \epsilon_{kink}$$

For a taxpayer with 6% reported profit margin, the exemption threshold represents a kink, not a notch, since their tax liability changes continuously around the cutoff.

C Estimation of revenue elasticity lower bound

Following Bachas and Soto (2021), we compute the lower-bound of average revenue elasticity considering that firms with different profit levels (generated by heterogeneity in fixed-costs) will face different incentives to bunch. First, recall that firms with counterfactual profits above 6% or below 0% will not decide to bunch, since they are not affected by the minimum tax. Second, for firms within that profit range, the incentive to bunch is directly proportional to their costs: firms with high costs (low profit margins) will have a strong incentive to bunch since their tax liability at the threshold will be small, while not bunching means a much larger tax liability based on their revenues.

Let $\Psi(y_0, c_0)$ be the joint distribution of revenue and costs. We can then express the amount of bunching taxpayers as

$$
\begin{aligned}
B &= \int_c \int_{Y^T}^{Y^T+\Delta Y} \Psi(y_0, c_0) dy dc \\
&= \int_c \int_{Y^T}^{Y^T+\Delta Y} \phi_y(y_0)\phi(c_0) dy dc \\
&= \int_{Y^T}^{Y^T+\Delta Y} \phi_y(y_0) \int_{c_0} \phi(c_0) dc dy \\
&= \int_{Y^T}^{Y^T+\Delta Y} \phi_y(y_0) \int_0^{m(y_0)} \phi(m_0) dm dy
\end{aligned}
$$

where in the second line we assume that the cost and revenue distributions are independent; in the third line we make it explicit that, for any given level of revenue, there is a cost region that will induce bunching; and in the last line we rewrite the expression as a function of profit levels instead of cost, and make it explicit that, for any given revenue level, only low-profit taxpayers will bunch, the upper threshold of which depends on the revenue level. Intuitively, for taxpayers very close to the notch, all those potentially affected by the minimum tax will decide to bunch, whereas those farther from it will only bunch if the differential tax liability is large due to their low profits.

In order to connect the cost/profit levels that induce bunching at each revenue level, recall that we previously computed that, for the marginal buncher at revenue level $Y^T + \Delta Y$, we can compute the revenue elasticity as

$$
\epsilon_{y,(1-t)} = \left(\frac{1}{\tau_y(2 + \frac{\Delta Y}{Y^T}) - 2\tau_\pi \frac{(Y_T - \hat{c})}{Y_T}} \right) \left(\frac{\Delta Y}{Y^T} \right)^2
$$

We can rewrite this equality putting the reported cost $\hat{c}$ in evidence:

$$\hat{c}^* = Y^T\left(1 - \frac{\tau_y}{\tau_\pi}\right) - \frac{\tau_y}{\tau_\pi}\frac{\Delta y}{2} + \frac{(\Delta y)^2}{2\epsilon_y \tau_\pi Y^T}$$

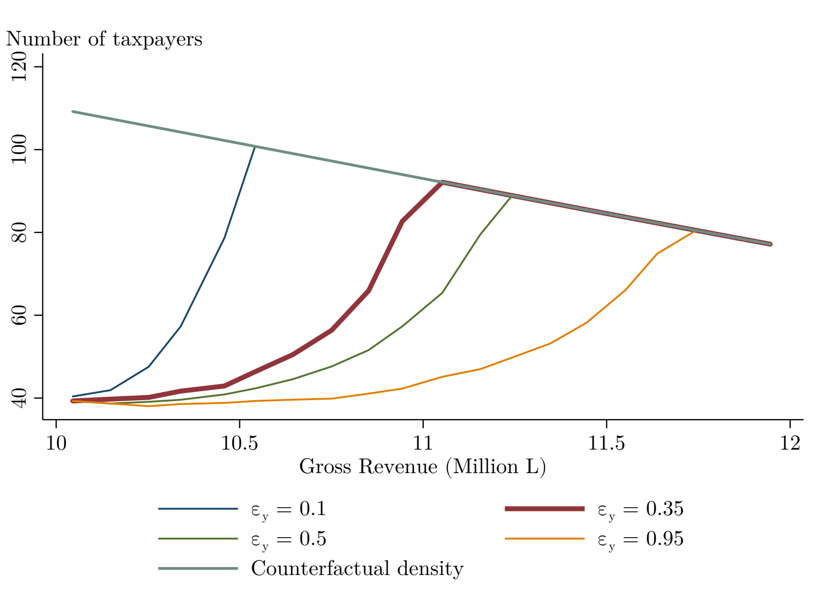
For a given revenue level and elasticity, $\hat{c}^*$ is the cost at the threshold that would make a taxpayer indifferent between bunching and staying above the notch. Any taxpayer with costs above that level, i.e. a lower profit margin, would decide to bunch.

We implement the estimation of the revenue elasticity ϵ_y in the following steps. First, we need to consider the counterfactual profit distribution that would be observed in the absence of the notch. For each period in our sample, we take that to be the observed profit margin density for firms reporting revenue in the interval L6 - 8 million[29]. We then proceed to compute, for each revenue bin (ΔY) and ϵ_y, what is the share of taxpayers with profit margin between 0 and the implied upper bound, and use the counterfactual density to obtain the number of taxpayers that bunch in each revenue bin. This allows us to obtain, for each potential revenue elasticity, the total number of predicted bunchers, which we compare to the estimated number of bunchers. The final elasticity, therefore, is the value that generates the same number of bunchers as the excess mass below the threshold.

We illustrate this procedure in Figure A25 for the pooled sample of taxpayers in 2014-2017. Each of the curves is a simulated density that would prevail under a different revenue elasticity, according to our methodology.

[29]We show in Figure A8 that the profit margin distribution is similar for the L6 - 8 million and L10-12 million range in the period before the introduction of the minimum tax.

Figure A25: Simulation to obtain average elasticity



Note: This figure presents the predicted density of gross revenues above the L10 million threshold and several simulations of what the density would have been given different revenue elasticities according to the model described above.

D Assessing dominated region with parametric model

As in Kleven and Waseem (2013), we consider a parametric model to assess what is the dominated region in our notch setting, that is, the interval of revenue that is (potentially) strictly dominated for taxpayers to locate at. Consider a simple version of our iso-elastic cost model (with no possibility to overreport costs), where firms are defined by a productivity parameter θ and a fixed-cost parameter α and profits are given by

$$\hat{\Pi}(y, \alpha) = y - \alpha - \frac{\theta}{1 + 1/e}\left(\frac{y}{\theta}\right)^{(1+1/e)} - T(y, \alpha)$$

First, note that under a pure profit tax ($T(y, \alpha) = \tau_\pi(y - c(y))$), we have that $y^* = \theta$, so the revenue choice reveals the productivity parameter. Under revenue taxation, the optimal revenue choice is $y^* = \theta(1 - \tau_y)^e$. Let the productivity of the marginal buncher be $\theta^T + \Delta\theta$. The marginal buncher is indifferent between reporting revenue exactly at the threshold or staying at their best interior solution.

Their profit under each decision are given by

$$\Pi_{Bunch} = (1-\tau_\pi)\Big(y^T - \alpha - \frac{\theta^T + \Delta\theta}{1+1/e}\Big(\frac{y^T}{\theta^T + \Delta\theta}\Big)^{1+1/e}\Big)$$

$$\begin{aligned}\Pi_{NotBunch} &= (1-\tau_y)y^* - \alpha - \frac{\theta^T + \Delta\theta}{1+1/e}\Big(\frac{y^*}{\theta^T + \Delta\theta}\Big)^{1+1/e} \\ &= (\theta^T + \Delta\theta)(1-\tau_y)^{1+e} - \alpha - \frac{\theta^T + \Delta\theta}{1+1/e}(1-\tau_y)^{1+e} \\ &= \frac{(\theta^T + \Delta\theta)(1-\tau_y)^{1+e}}{e+1} - \alpha\end{aligned}$$

Finally, since the internal solution for the marginal buncher, had they not bunched, could be written as $y^T + \Delta Y = (\theta^T + \Delta\theta)(1-\tau_y)^e$, we can replace the terms involving the (unobserved) taxpayer type with the (observed) thereshold and the (estimable) change in revenue. We then have

$$\begin{aligned}\Pi_{Bunch} &= \Pi_{NotBunch} \\ (1-\tau_\pi)\Big(y^T - \alpha - \frac{y^T + \Delta y}{(1-\tau_y)^e(1+1/e)}\Big(\frac{y^T(1-\tau_y)^e}{y^T + \Delta y}\Big)^{1+1/e}\Big) &= \frac{y^T + \Delta y}{(1-\tau_y)^e}\frac{(1-\tau_y)^{1+e}}{e+1} - \alpha \\ (1-\tau_\pi)(y^T - \alpha) - (1-\tau_\pi)(1-\tau_y)\frac{y^T + \Delta y}{1+1/e}\Big(\frac{y^T}{y^T + \Delta y}\Big)^{1+1/e} &= \frac{1-\tau_y}{e+1}(y^T + \Delta y) - \alpha\end{aligned}$$

Let's consider what happens when taxpayers have $e = 0$. Taking the limit of the above equality as elasticity goes to zero we get:

$$\begin{aligned}(1-\tau_\pi)(y^T - \alpha) - \frac{1-\tau_y}{1}(y^T + \Delta y) + \alpha = 0 \\ Lim_{e\to 0}\Delta y = \frac{\tau_y y^T - \tau_\pi(y^T - \alpha)}{1-\tau_y}\end{aligned}$$

Some things to note. First, if $1-\alpha/y^T = 0.06$, then $Lim_{e\to 0}\Delta y = 0$: for taxpayers with "profit margin" equal to 6% and zero elasticity, there exists no dominated region - the notch becomes a kink. For those with $y^T = \alpha$, so they report non-positive profits, $Lim_{e\to 0}\Delta y = \frac{\tau_y * y^T}{1-\tau_y} = L152,000$. These are the taxpayers with strongest incentive to bunch, and the region between L10 million and L10,152,000 is dominated. For those with taxable income rates between 0-6%, the dominated region lies between 0 and L152,000.

In our empirical estimation of elasticity we use bins of L100,000. According to the calculation above, no taxpayers with taxable income rate between 0 - 2% should locate in that region. Using the counterfactual taxable income rate distribution, this group represents approximately 30% of taxpayers, meaning that no more than 70% of taxpayers could be observed reporting revenue above the threshold. As can be seen in Figure A25, for the first bin we observe less than 70 taxpayers while the counterfactual distribution predicts 110 taxpayers. So we cannot reject that, under 0 elasticity, all taxpayers that should bunch have actually bunched. Note that this is an extreme assumption, and we just cannot precisely explore the notch to recover "innatention" as in Kleven and Waseem (2013) or Londoño-Vélez and Ávila-Mahecha (2019).

E Model calibration details

We modify firms' profit function by making explicit assumption about the cost and misreporting loss functions. Firms have isoelastic costs and also isoelastic loss function from misreporting costs:

$$\hat{\Pi}(y,\hat{c}) = (1-\tau)y + \tau\mu\hat{c} - \alpha_i - \frac{\theta_i}{1+1/e}\left(\frac{y}{\theta_i}\right)^{(1+1/e)} - \frac{B_i}{1+1/\gamma}\left(\hat{c}-c(y)\right)^{(1+1/\gamma)}$$

Each taxpayer is characterized by the vector $(\theta_i, \alpha_i, B_i)$ that define productivity, fixed cost and evasion ability, respectively. Given our functional forms, optimal vector of output and reported costs $(y^*, \hat{c}^*(y^*))$ are:

$$\begin{aligned} y^* =& \theta(1-\tau_E)^e \\ \hat{c}^*(y^*) =& c(y^*) + B_i\left(\tau\mu\right)^\gamma \end{aligned}$$

where $\tau_E = \tau\left(\frac{1-\mu}{1-\tau\mu}\right)$. Note that if we have profit taxation then $\mu = 1$ and $\tau_E = 0$, so firm size is undistorted.

In order to calibrate the model, we use data for the 2013, when no notches or kinks were in place. Under profit taxation, we have:

$$\begin{aligned} y^* =& \theta \\ c(y^*) =& \alpha + \frac{\theta}{1+1/e} \\ \hat{c}^*(y^*) =& \alpha + \frac{\theta}{1+1/e} + \left(\frac{\tau}{B_i}\right)^\gamma \end{aligned}$$

From the first-order conditions of an interior optimum, θ is simply the vector of reported output, which in this model coincides with real output. We also know the elasticity of output e, which we fix to be $e = 0.99$, the upper bound estimated for the pooled years. By using the upper bound of our elasticity estimate we are conservative in the case for using output taxation, since a higher elasticity will limit the potential benefit of the tax.

While we do not observe $c(y^*)$, the real costs, but only the reported costs $\hat{c}^*(y^*)$, we have estimated evasion as a share of profits using the 6% profit margin kink. Let that quantity be $\epsilon_{\hat{c}}$ .Using the fact that at the profit margin kink $(y - \hat{c})/y = \tau_y/\tau_\pi$ we can write:

$$\frac{(\hat{c} - c)}{y} = \frac{(\hat{c} - c)}{(y - \hat{c})} * \frac{(y - \hat{c})}{y} = \epsilon_{\hat{c}}(\tau_y/\tau_\pi) = \epsilon_{\hat{c}} * 0.06$$

Using the equations above, we have that

$$\frac{(\hat{c} - c)}{y} = \frac{\left(\frac{\tau}{B_i}\right)^\gamma}{\theta} = 0.06\epsilon_{\hat{c}}$$

In our setting, we do not have variation to identify γ, the elasticity of misreporting costs. Best et al. (2015) explore different profit tax rates for different subset of firms, while Bachas and Soto (2021) use estimates of cost elasticity in two different thresholds. We calibrate our model using the estimate from Best et al. (2015), which is approximately 1.5, which allows us to recover B_i as $B_i = \frac{\tau}{\left(\theta 0.06\epsilon_{\hat{c}}\right)^{1/\gamma}}$

Finally, given the previous we can just obtain the fixed cost vector α by computing

$$\alpha = \hat{c}^* - \frac{\theta}{1 + 1/e} + \left(\frac{\tau}{B_i}\right)^\gamma$$

F Social Contribution Tax and Net Asset Tax

Corporations face a 25% flat tax on yearly profits in Honduras. Three other provisions affect their potential tax liability. The first is the minimum tax studied in this paper, which was introduced in 2014 and started to phase out in 2018. Since 1994, corporations also face a net asset tax similar in nature to a minimum tax: if the tax liability under the asset tax is smaller than the profit tax liability, it can be used as a credit, meaning that in practice firms would only pay the profit tax. If the asset tax is larger, firms formally must pay the income tax and the additional difference between the two liabilities. In practice, the asset tax is also a tool to avoid that large corporations minimize their tax liability by inflating costs and driving down taxable income. In the period under study, the net asset tax was 1% of the net assets above L3 million.

The last provision is the Social Contribution (AS for the spanish *Aportación Solidaria*) tax, a surcharge on income tax applying to large firms. Established for the first time as a temporary measure in 2003, the AS tax rate varied between 5-10% in the period of this study and applied to declared taxable income above L1 million (USD 40,000)[30].

In Table A6 we present the distribution of firms by their tax status in each year of the sample. Both the AS and the asset tax existed throughout the analysis period, while the minimum tax was established in 2014. In each year, approximately one-quarter of tax filing corporations pay no income tax - this is often the result of generating no revenue in the period or, more frequently, registering losses (and not having enough assets to pay the Net Asset tax). Before the introduction of the minimum tax, around 63% of corporations were liable for income tax and 9% for the net asset tax. With the introduction of the minimum tax in 2014, the share of firms liable for asset tax does not change, but the share paying income tax falls by 8 percentage points as firms start being liable for the minimum tax. Between 1,400 and 1,700 firms were paying the minimum tax before 2018, when the number falls drastically to only 135 once the exemption threshold increases from L10 million to L300 million. The Social Contribution tax was payed by 8-10% of corporations every year, and it is a surcharge on those paying either income or minimum tax, but not the asset tax[31].

[30] A tax reform in 2010 established the AS tax rate at 10% for the first two years and then progressively declined to zero by 2015. With the 2014 tax reform, nonetheless, the tax was made permanent and the tax rate fixed at 5%.

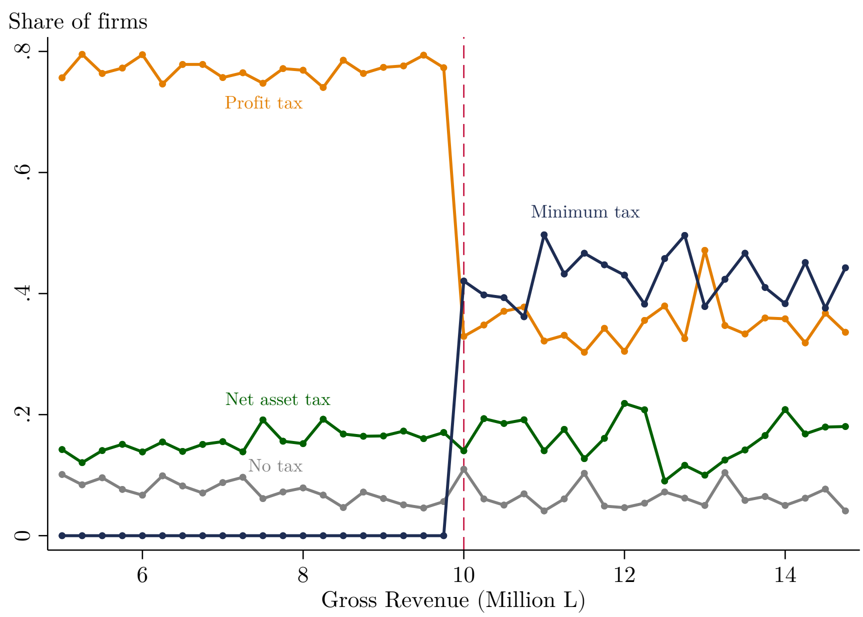
[31] In order to arrive at the final tax liability, the Tax Authority first calculates the maximum between the income tax and the minimum tax liabilities, and add the social contribution liability to that. This value is then compared to the asset tax liability, and the maximum of these two is the final tax liability.

Table A6: Taxpayer status by year

Year	Not taxed	Income Tax	Asset Tax	Minimum Tax	Total
2011	4,791	10,940	1,563	0	17,294
2012	4,763	11,548	1,798	0	18,109
2013	4,945	12,372	1,906	0	19,223
2014	5,397	11,566	1,891	1,610	20,464
2015	6,237	13,997	1,944	1,480	23,658
2016	6,641	15,553	2,057	1,478	25,729
2017	7,328	16,544	2,281	1,672	27,825
2018	7,946	19,080	2,783	135	29,944

Note: This table presents the distribution of corporate taxpayers each year, according to their tax liability status.

Figure A26: Share of firms liable for each type of tax (2014-2017)



Note: This figure presents the share of firms liable for each type of tax (profit, minimum, net asset or no tax), in each bin of gross revenue for the period 2014-2017 pooled. It shows that when crossing the L10 million exemption threshold the increase in the share of firms paying the minimum tax is mirrored by a decrease in the share of firms liable for profit tax, with little change observed in the share of firms paying the net asset tax or not paying any taxes. The sample excludes corporations exempt from the minimum tax due to sectoral exceptions and/or recent start of operations.

G Minimum taxes around the world

This section presents a summary of corporate minimum tax schemes across low and medium income countries. Table A7 lists several countries that adopted some type of minimum tax for corporations as of 2019, the minimum tax rate (applied to gross revenues, in the majority of cases), the profit tax rate and specific relevant provisions.

We highlight features that are common in several contexts. First, several countries exempt firms in the first 24-36 months of operations, a period where initial investment and set-up costs might legitimately generate low or negative profits (Holland and Vann 1998). Second, the tax rate applied to gross revenues often falls in the range of 0.5 - 2%, with reduced rates (or exemptions) applied to sectors such as pharmaceuticals, utilities and oil related industries. While this determines a floor for the effective tax rate (tax liability as share of gross revenues) corporations must pay, the implied minimum allowable profit margin (that is, the minimum profit margin reported such that firms are not paying the minimum tax rate) also depends on the corporate profit tax rate. In most countries the minimum allowable profit margin falls in the range of 1.5 - 5%, below the 6% level implied by the 1.5% gross revenue tax and 25% profit tax in place in Honduras in the period 2014-2017. Finally, in all but a few countries the minimum corporate tax provision apply to all firms, regardless of size.

Table A7: Summary of minimum tax provisions around the world

Country	**Minimum tax rate**	**Profit tax rate**	**Details**
Bangladesh	0.6%	25%/35%	Companies are exempt if gross revenues are below BDT 5 million. Reduced rates of 1% for tobacco related manufacturers, 0.75% for mobile phone companies and 0.1% for industrial sectors in first three years of operation. Profit tax rate is 25% for publicly traded companies and 35% for private limited companies.
Benin	1%	30%	Reduced rate of 0.75% for industrial companies.
Cambodia	1%	20%	
Cameroon	2%	30%	
Chad	1.5%	35%	Companies are exempt if gross revenues are below XAF 50 million. Minimum of XAF1 million for small companies and XAF2 million for large companies.
Republic of Congo	1.00%	30%	For firms below XAF 10 million the minimum tax is XAF 500,000.
Cote d'Ivoire	0.5%	25%	0.1% for utilities and 0.15% for financial companies. Minimum tax cannot be less than XOF3 million or more than XOF 35 million. Corporations are exempt in first fiscal year.
Dominican Republic	1%	27%	Tax base is gross assets.
Gabon	1%	30%	Minimum of XAF1 million. Newly incorporated companies are exempt for two years.
Guinea	1.5%	25%	Minimum of GNF15 million.
Guyana	2%	25%/40%	Profit tax rate is 25% for commercial companies and 40% for non-commercial companies
India	15%	30%	Tax base is book profits.
Madagascar	0.5%	20%	The minimum tax is calculated as MGA 320,000 (100,000 for some sectors) plus 0.5% of annual gross revenue.
Mauritania	2.5%	25%	Minimum of MRO 750,000.
Morocco	0.75%	10%/31%	Minimum of MAD3,000. Reduced rate of 0.25% petroleum, utilities and some food production sectors. New companies are exempt for three years. Corporate profit tax schedule is progressive with increasing marginal rates of 10, 17.5 and 31%.
Nicaragua	1-3%%	30%	Firms are exempt in first three years of operations.
Pakistan	1.25%	29%	Lower rates applies to oil (0.5%) and pharmaceutical (0.2%) sectors. An additional "alternative minimum tax" of 17% applies to accounting income.
Philippines	2%	30%	Corporations are exempt in the first three years of operation.
Senegal	0.5%	30%	Mininum of XOF500,000 and maximum of XOF5 million. Minimum tax rate applies to gross revenue in preceding fiscal year.

Note: This table provides a non-exhaustive list of countries that adopted some type of corporate minimum tax as of 2019. Tax base is gross revenues (turnover) unless stated otherwise. *Sources*: Ernest Young Worldwide Corporate Tax Guide 2019 and Deloitte Corporate Tax Rates 2020.

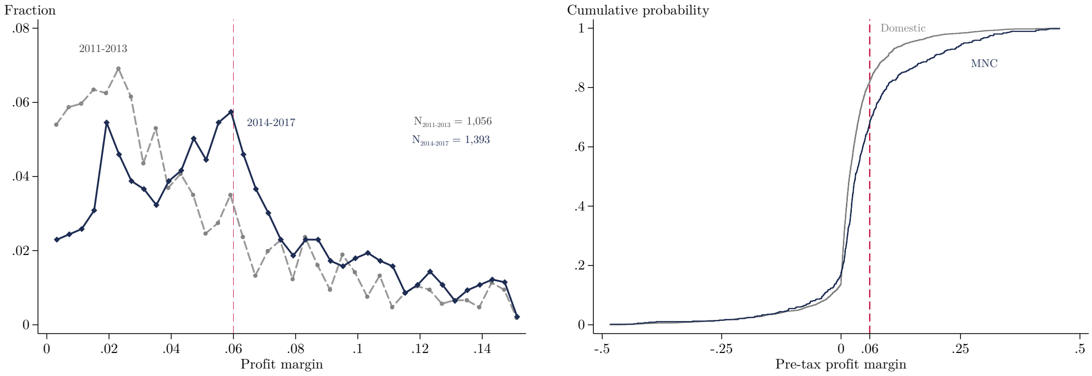
H How did multinational enterprises responded to the minimum tax?

Given the ongoing discussions on multinational taxation at the global level, we investigate whether the minimum tax in Honduras seem to have affected how multinational corporations (MNEs) use transfer pricing (i.e. transactions with related counterparts) costs to potentially reduce tax liability.

In Figure A27, panel a, below we present preliminary evidence that, as observed in the sample of all corporations, MNEs also increased their reported profit margins when the minimum tax policy was introduced in 2014. The extent of adjustment, nonetheless, is much more muted than for the full sample. This is partly explained by the fact that, previous to the policy introduction, large MNEs were already declaring higher profit margins than their domestic counterparts (panel b).

Even though the overall adjustment by MNEs is smaller than by domestic firms, it is possible that the nature of this adjustment happens through the mechanism of transfer pricing. That is, it is possible that MNEs were more aggressively pricing transactions with foreign related parts before the introduction of the policy, in order to book profits on lower-tax jurisdictions, and changed their behavior in response to the introduction of the minimum tax policy.

Figure A27: Profit margin of Multinationals



(a) Empirical density of profit margins for MNEs

(b) Pre-tax profit margin CDF - Domestic vs. Multinational corporations

Note: Panel A in figure presents the empirical density of positive reported profit margins for multinational corporations (MNEs), before (2011-2013) and during (2014-2017) the existence of the minimum tax. It restricts the sample to MNEs declaring gross revenue above L13 million, significantly above the policy revenue exemption threshold. Bins are 0.4 percentage points wide. Panel B presents the cumulative distribution functions (CDF) of pre-tax profit margins by domestic and multinational firms in 2013, before the introduction of the minimum tax. The CDF of MNCs is shifted to the right (for positive values), indicating higher declared profit margin across the distribution. MNCs are defined as taxpayers that present transfer pricing declarations at some point in 2014-2018.

We obtained transaction level data on transfer pricing operations for all corporations operating in Honduras. Here we highlight some features of the data. First, corporations file transfer pricing declarations not only for transaction with foreign counterparts, but also with domestic partners that are under joint control. Almost 45% of total costs declared in TP declarations are with domestic partners (we define MNEs as firms with at least one TP transaction with a *foreign partner*). Corporations in the country file transactions with 94 other countries, with the majority of total volume concentrated in the United States (14%), Panama (13%) and Guatemala (5%) - all other countries combined make up 25% of claimed costs but with very fragmented shares. Among the top 15 trading partners, however, we observe countries widely recognized for offering "low tax rates and favorable regulatory policies to foreign investors" (Hines Jr. 2010): British Virgin Islands, Cayman Islands, Bahamas and Bermuda.

In Table A9 below, we present descriptive statistics for the MNEs and domestic firms in 2017 and 2018. MNE are much larger than domestic firms both in terms of gross revenue and taxable income: over 80% of MNEs had revenue above the L10 million exemption threshold for minimum tax in place until 2017 and more than a quarter had revenue above L300 million, the new exemption threshold in 2018. We also show that in 2017 over 80% of MNEs declared costs arising from a transaction with a related part[32] - 70% of them declared transactions with foreign partners and 45% with a domestic partner. Only a tiny share of domestic firms (2%) file a TP declaration informing of a transaction with a domestic related partner. Tax havens are also a popular source for foreign partners: 30% of MNEs declare at least one transaction with a related partner hosted in a tax haven (using the definition of Hines Jr. (2010)). We also show that, conditional on filing a TP declaration with a foreign partner, the (unweighted) average TP cost as a share of total costs is 32%, suggesting that costs arising from transactions with related parts are a meaningful share of the cost deductions used by MNEs. Finally, we should note that the number of MNEs filing income taxes every year is small (≈ 800).

Table A9: Descriptive statistics

	2017		2018	
	MNE	Domestic	MNE	Domestic
Revenue (Million L)	523.34	14.24	545.29	13.76
	(1502.42)	(180.09)	(1633.36)	(154.35)
Share firms with revenue over L10 million	0.84	0.15	0.84	0.16
	(0.36)	(0.36)	(0.36)	(0.37)
Share firms with revenue over L300 million	0.27	0.01	0.27	0.01
	(0.44)	(0.08)	(0.45)	(0.08)
Pre-tax profits (Million L)	45.09	0.24	46.09	0.03
	(218.43)	(40.09)	(244.65)	(41.74)
Use of Transfer Pricing				
Share firms declaring TP cost	0.82	0.02	0.80	0.02
	(0.39)	(0.14)	(0.40)	(0.14)
Share firms declaring TP cost (foreign partner)	0.69	0.00	0.67	0.00
	(0.46)	(0.02)	(0.47)	(0.02)
Share firms declaring TP cost (domestic partner)	0.44	0.02	0.44	0.02
	(0.50)	(0.14)	(0.50)	(0.13)
Share firms declaring TP cost (tax havens)	0.30	0.00	0.27	0.00
	(0.46)	(0.01)	(0.45)	(0.01)
Share of costs from foreign TP transactions	0.32	0.00	0.32	0.00
	(0.36)	(0.04)	(0.37)	(0.04)
N	769	27,056	772	29,172

Note: This table reports descriptive statistics for the sample of corporations filing income taxes in Honduras in the period 2017 and 2018, separately for multinational enterprises (MNE) and domestic firms. MNEs are identified as firms presenting a transfer price declaration with a foreign related party in the period 2014-2018.

[32] Our definition of MNEs is that the taxpayer filed at least one TP declaration in the period 2014-2018, so in any given year some MNEs might not be filing any TP costs.

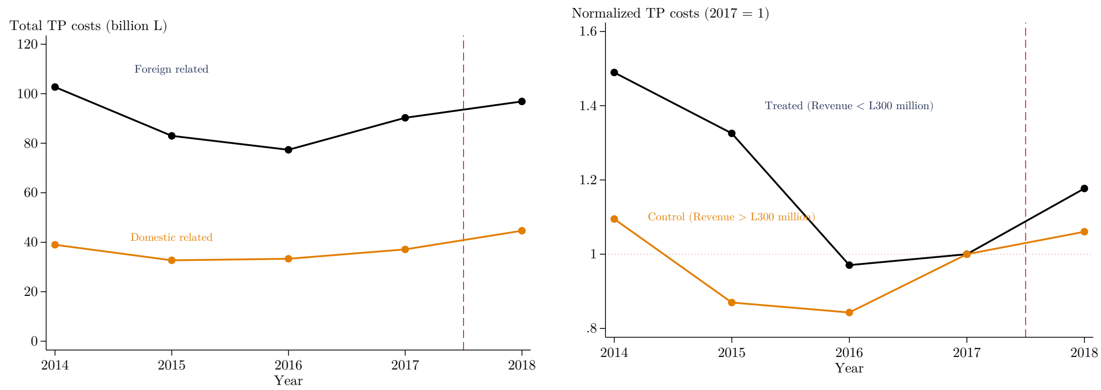
One key limitation of the transfer pricing data for our exercise should be noted. That data is only available for the 2014-2018 period, meaning we cannot observe changes in behavior before and after the introduction of the minimum tax in 2014. As we document above, the sample of multinationals is rather small so in any case we cannot perform exercises relying on local variation around specific thresholds (e.g. there are only ≈ 120 firms with revenue between L8 - L12 million when pooling the entire 2014-2017 period).

For those reasons, we take a different approach to evaluate whether MNCs responded to the minimum tax policy. First, instead of considering the introduction of the policy in 2014, we will explore the variation generated by the phasing out of the policy in 2018. For that year, the revenue exemption threshold increased from L10 million to L300 million. According to Table A9 above, approximately 60% of MNEs (≈ 450 firms) declared revenue in that interval in 2017 and therefore were not exempt from the minimum tax that year but would be exempt in the following year if declaring the same revenue. Conversely, firms declaring revenue above L300 million in 2017 (≈ 200) were not affected by the increase in the exemption threshold in 2018, since they were still liable for the minimum tax. If, in the absence of the change in policy, the use of transfer pricing costs would have been similar among these two groups of firms, any differential behavior observed in 2018 could be attributed to the impact of the minimum tax.

We start our analysis by presenting simple aggregate costs claimed through transfer pricing operations in each year (Figure A28, panel a), separately for domestic and foreign counterparts. Costs claimed from transactions with foreign counterparts are 2 - 2.5 larger than those with domestic partners, but over time the pattern of aggregate costs is similar: they decreased in the period 2014 - 2016 then increased back to initial levels by 2018.

In panel (b) we present in graphical form the "differences-in-differences" approach we propose. We compare the amount of TP costs claimed from transactions with foreign parties for firms with revenue above L300 million in 2017 (186 firms) and those with revenue between L10 and L300 million (374 firms). We normalize the amount to one in 2017, so the graph presents the percentage change from that baseline year for each group. If affected MNEs reacted to the withdrawn of the minimum tax by significantly increasing their costs (since now they would be taxed on profits), we should see a substantial increase in TP costs for that group in 2018, but not for those with revenue above L300 million. We do see that the total amount of TP costs claimed by the firms likely to be affected increased more (18%) when compared to those less likely to be affected (6%). However, the pre-trends of TP costs usage in these two groups are widely different. For those with revenue below L300 million, the total costs claimed were almost 50% higher in 2014 than 2017, and then increase again in 2018. For those with revenue above L300 million, costs were about 10% higher in 2014 when compared to 2017, then fell 10 - 20% below 2017 levels before recovering.

Figure A28: Transfer-pricing costs by multinationals



(a) Total TP costs - foreign vs domestic

(b) Normalized foreign TP costs - above vs. below L300 million

Note: This figure presents trends in the use of costs through transfer pricing operations by MNEs in the period 2014-2018. Panel (a) presents aggregate costs, separately for foreign and domestic partners, while panel (b) presents costs normalized to one in 2017, separately for firms with revenue above L300 million in 2017 and those below. In both figures we restrict the sample to a balanced panel of MNEs filing every year in the period and declaring revenue above L10 million.

The figure above is suggestive that any DiD approach will likely fail the pre-trends test. We formally estimate the following DiD regression for the same sample of MNEs:

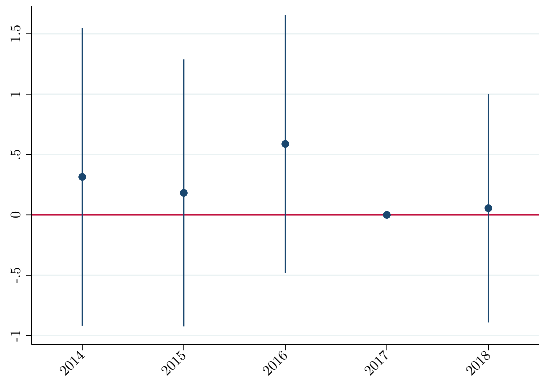
$$log(1 + costs_{fy}) = \sum_{y=2014}^{2018} \beta_y \mathbb{1}\{treat = 1\} * \mathbb{1}\{year = y\} + \gamma_f + \delta_y + \epsilon_{yf} \qquad (15)$$

where the outcome variable is $log(1 + costs)$ for firm f in year y; we include firm and year fixed effects; and our coefficients of interest are β_y, the differential use of TP costs by treated and control firms for every year.

We plot the resulting coefficients of interest in Figure A29 below, where the outcome is the log of TP costs with foreign partners. The first feature of the results is that they are extremely noisy: in the pre-2017 period, we cannot reject that deviations of TP cost usage is similar among the two groups, but the 95% CI often cover the interval [-1,1.5] log-points, with point estimates of approximately [0.3, 0.5]. The point estimate for the difference in 2018 is much closer to zero, but still with very wide confidence intervals. That is likely partly driven by our sample size: we only have 450 multinationals in the balanced sample, so our sample size in the regression is 2,250 observations. We also present results in table format in Table A10, where we additionally estimate a similar regression using costs with domestic partners and costs with partners in tax havens as outcomes of interest. The same pattern emerges: coefficients are very imprecisely estimated, and while all our estimates are not statistically different than zero we cannot rule out very large effects both before and after the 2017 phase-out of the minimum tax.

Our main takeway from these exercises is that while the effects of the minimum tax in Honduras on MNC are of much interest, we might not be able to precisely estimate them. That is in part because there are just not that many MNCs operating in the country, and also because our data has a limited time coverage and the phase out in 2018 only left out an even smaller number of very large MNCs unaffected by the change.

Figure A29: Differences-in-differences estimates of TP costs



Note: This figure presents the point estimates and 95% CI of the coefficients of interest in Equation 15. Standard errors were computed clustered at the taxpayer level.

Table A10: Differences-in-differences - Use of Transfer Pricing costs

	(1) Domestic partners	(2) All foreign partners	(3) Tax havens
Treated * 2014	-0.640	0.315	-0.466
	(-0.95)	(0.50)	(-0.74)
Treated * 2015	-0.327	0.182	-0.495
	(-0.53)	(0.32)	(-0.84)
Treated * 2016	-0.474	0.588	-1.121**
	(-0.91)	(1.08)	(-2.04)
Treated * 2018	-0.125	0.0559	-0.415
	(-0.31)	(0.12)	(-0.90)
Observations	2250	2250	2250
R-Squared	0.739	0.814	0.774

Note: This table reports results from estimation of Equation 15 above. The sample consists of a balanced panel of MNEs filing every year between 2014 - 2018. Treated firms are those reporting gross revenue between L10 and L300 million in 2017, while non-treated firms are those reporting revenue above L300 million in 2017. Standard-errors clustered at the taxpayer level are reported in parentheses.

I Did the minimum tax lead to firm exit?

One key concern about minimum taxes specifically, and other distortive taxes in general, is that they might lead to firm exit. Some activities that might be worth pursuing when the tax base is profits – since the tax burden will be limited when profits are low or negative – become economically unfeasible if taxes are assessed on gross revenue. Here we provide more details on the exercises we perform to assess whether the introduction of the minimum tax in Honduras caused higher exit by affected firms.

We note the following. First, precisely because we show that firms manipulate their gross revenue in order to avoid the minimum tax threshold, we cannot use a regression discontinuity design to assess the policy impact, comparing firms just below and just above the exemption threshold. Second, both the behavioral response in terms of reported revenue and the fact that costs were overreported before the reform suggest that evasion responses might dampen any real economic responses.

The intuition behind our exercises is as follows. We determine groups of firms that were likely to be affected by the 2014 minimum tax based on **pre-reform characteristics**. Since the minimum tax only affected firms that would have declared gross revenue above L10 million and profit margins below 6% after its introductions, we use these thresholds to assign firms to the "treatment group": firms with revenue above L10 million and profit margin below 6% before the reform are more likely to be affected and potentially exit in response to the higher tax rate they will face.

We first define those groups by their characteristics in 2011, the first year in our panel dataset, and then follow firms until 2016 - we stop measuring firm exit before the end of our panel so we can assign firm exit only to those corporations that did not file in any subsequent period in the future. In Figure A30, starting from the universe of filing firms, we construct four groups based on their revenue & profit margins in 2011 and follow their survival throughout the period. As we should expect, large firms (with revenue above L10 million in 2011) are more likely to survive over the entire period in comparison with smaller firms. Conditional on size, high-profit firms (declaring profits above 6% in 2011) are also more likely to survive than low-profit ones. But the figure does not suggest any **differential exit** by firms likely to be affected (high revenue & low profit) when compared to the other groups.

We implement a more formal testing of those differential exit rates in regression form. We consider a differences-in-differences setting, comparing the exit rate after the reform between firms with high- vs. low-revenue and those with high- vs. low-profitability. Formally, we estimate the following model using a cross-section of firms that file taxes in 2013:

$$Exit_{i,Y} = \alpha_i + \gamma_1 AboveL10_{i,before} + \gamma_2 Below6\%_{i,before} + \beta AboveL10_{i,before} * Below6\%_{i,before} + \epsilon_i \tag{16}$$

We are interested in the coefficient β, that presents the differential exit rate for firms likely to be affected by the reform: those with revenue above the L10 million threshold and profit margins below 6%. Since the reform was introduced in 2014, we present results for exit in different horizons: one, two and three-years after the reform. In our baseline specification[33], we define the groups by their declared revenue and profit margins in 2013, the year before the reform.

In Table A11, we present our results for the three exit horizons and considering two different samples. In columns (1)-(3), we use firms declaring gross revenue between L4 and L20 million in 2013, therefore restricting the sample to firms that were not too different in size but in both sizes of the minimum tax revenue threshold. In columns (1) and (2), the differential exit by 2014 and 2015 is very close to zero and not statistically different from zero. The estimate for differential exit by 2016, in column (3), is 2 percentage points - a larger effect in economic terms, considering

[33]We control for economic sector of taxpayers in all regressions.

the 10% general exit rate, but it is not statistically different from zero. Of course, our key results show that firms that would have declared revenue slighlty above L10 million after 2014 decide to bunch, so that is an important response margin that might mitigate any exit decisions.

For that reason, in columns (4) - (6) we lift the sample restriction and include all firms declaring income taxes in 2013. The sample increases five-fold (since most firms in 2013 declare revenue below L4 million), but now the comparison group includes firms vastly different in size. While the estimate for the first year is similar in size to the restricted sample, results for exit by 2015 (1.6 p.p.) and 2016 (3.6) are much larger in magnitude and statistically different than zero. They suggest that large firms with low profit margins were more likely to stop filing income taxes after the reform, which we use to proxy for firm exit.

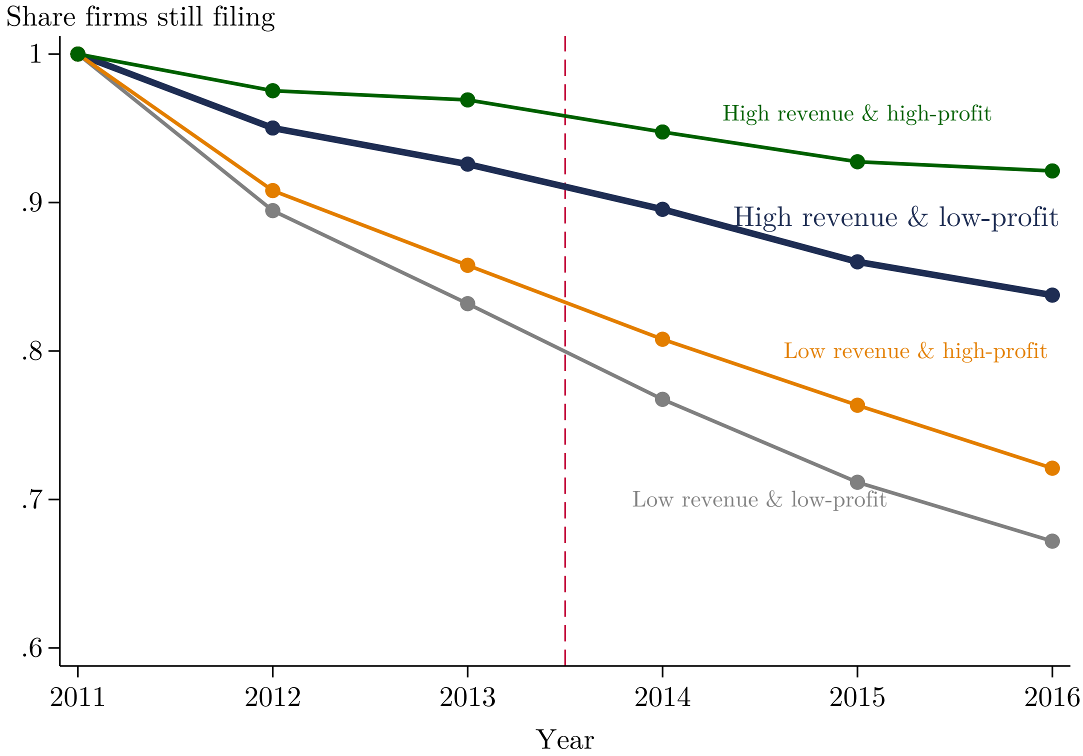
Since sample restrictions meaningfully affect the results, we provide a host of robustness tests in Figure A31, where we plot the interaction coefficients for the regression considering exit by 2016, using different sample restrictions based on declared revenue in the base year. Here we show that restricting the sample to firms in a narrow band around the L10 million threshold in 2013 leads to small coefficients in magnitude but wide confidence intervals. As we expand the sample around the threshold, the coefficients increase from less than 1 p.p. to the range 2.5 - 3.5 p.p., with some estimates being significantly different from zero.

Under the assumption that we can attribute any changes in exit for high-revenue, low- profit-margin firms to the minimum tax, the previous result are suggestive that the reform might have increased firm exit by as much as 3.5 p.p. in the years following it.

Since our results are not quite robust across specifications and to stress our empirical specification, we also conduct a series of placebo tests. We implement the same specification used across samples in Figure A31, but instead consider the base-year as 2011 and measure exit rates by 2013 - **before the introduction of the minimum tax**. We are not aware of any policies that might have affected the same group of firms, so our prior is that we should obtain null estimates. As we present in Figure A32, nonetheless, for a range of samples we estimate negative coefficients that are economically and statistically significant: the group of firms with revenue above L10 million and low profit margins in 2011 were 3 - 5 p.p. less likely to exit by 2013.

Given the sensitivity of our estimates to specification and the significant results estimated in the placebo regression, we avoid making claims about the impact of the introduction of a minimum tax on firm exit in our setting.

Figure A30: Firm survival using panel data



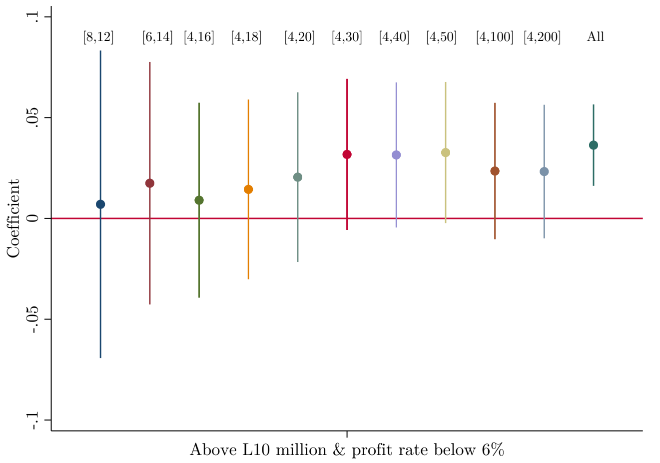
Note: These figures present the share of firms, in each year, that existed in 2011 and still file in each year. In both panels the sample is restricted to firms that presented a declaration in 2011. In panel A we restrict the sample to firms with gross revenue above L10 million in 2011 (and therefore likely to be affected by the minimum tax in the future) and present results separately for firms with low (below 6%) and high (above 6%) profit margins in 2011. In panel B, we restrict the sample to firms with low profit margins and present results for firms with low (below L10 million) and high (above L10 million) revenue in 2011.

Table A11: Regression: probability of exit by revenue & profit margin

	(1) Exit by 2014	(2) Exit by 2015	(3) Exit by 2016	(4) Exit by 2014	(5) Exit by 2015	(6) Exit by 2016
Revenue above L10 million	-0.00543	-0.0236	-0.0371**	-0.0364***	-0.0684***	-0.104***
	(-0.47)	(-1.43)	(-2.07)	(-6.54)	(-9.24)	(-12.46)
Profit below 6%	0.0138	0.0192	0.0329**	0.0112***	0.0177***	0.0101
	(1.58)	(1.47)	(2.22)	(2.66)	(3.22)	(1.60)
Interaction	-0.00543	0.00705	0.0205	0.00942	0.0163*	0.0364***
	(-0.40)	(0.36)	(0.95)	(1.35)	(1.78)	(3.53)
Observations	3725	3725	3725	19223	19223	19223
R-Squared	0.00965	0.0134	0.0182	0.00954	0.0157	0.0197
Dep var mean	0.0368	0.0738	0.102	0.0588	0.105	0.140
Revenue restriction?	L4 - L20 MM	L4 - L20 MM	L4 - L20 MM	None	None	None

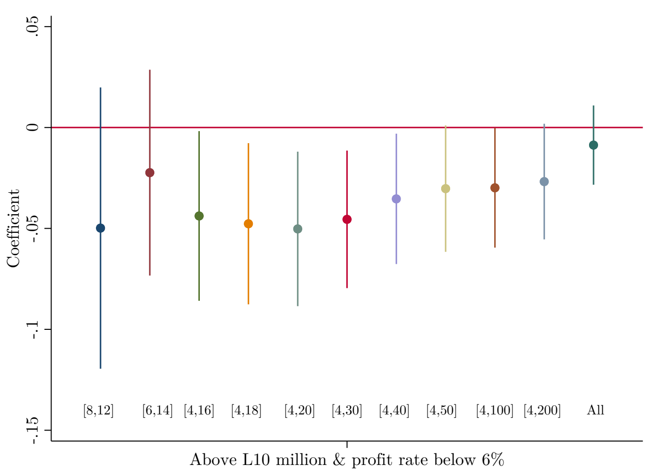
Note: This tables presents the coefficients of a regression using an indicator for exit by each year as dependent variable. The sample is restricted to corporations filing income taxes in 2013, the year used to calculate groups based on gross revenue and profitability. Robust standard errors in parentheses.

Figure A31: Coefficients on exit (different revenue windows)



Note: This figure presents the coefficients on the interaction term for firms with revenue above L10 million and profit margin below 6% in 2013, as in the regressions estimated in Table A11. The intervals indicated above each coefficient refer to the sample restriction related to declared gross revenue in 2013, the year before the introduction of the Minimum Tax. The first coefficient, for example, is estimated in a regression restricting the sample to firms with gross revenue between L8 - 12 million in 2013, while the last coefficient refers to a regression using all firms in 2013, regardless of revenue.

Figure A32: Coefficients on exit (different revenue windows) - Placebo test



Note: This figure presents placebo tests, where the coefficients on the interaction term for firms with revenue above L10 million and profit margin below 6% in 2011, as in the regressions estimated in Table A11. The intervals indicated above each coefficient refer to the sample restriction related to declared gross revenue in 2011, while the dependent variable is exit by 2013, the year before the introduction of the minimum tax.