The Costs of Firm Growth

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Abstract

Regulation often relies on size thresholds to determine the applicable legal and tax regime. Using data on the universe of Italian firms, this paper estimates the costs of firm growth by measuring the extent to which firms bunch just below such thresholds in order to avoid more burdensome rules. We first identify all the rules defined in terms of revenues, assets, and employment that generate bunching. We then embed the estimated bunching in a profit maximization model and estimate a behavioral elasticity specific to each underlying variable, leveraging directly observable costs to calibrate the model. Finally, we combine the estimated elasticities with the observed bunching at each threshold to quantify the costs of all regulations. The largest costs, relative to average value added for firms located near the threshold, are associated with the loss of a flat-tax regime for the self-employed, followed by the loss of simplified bookkeeping and quarterly VAT settlement, the mandatory appointment of a board of statutory auditors, and the increase in worker protections in the event of dismissal.

JEL Classification: D22, L51, H25, H32, K22.

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1 Introduction

How costly is it for a firm to grow? The question matters because larger firms are, on average, more productive, pay higher wages, and account for a disproportionate share of aggregate output [Bartelsman et al., 2013; Bloom et al., 2018]. European countries where small firms are overrepresented, such as Italy and Greece, exhibit lower average productivity and weaker productivity growth [Bugamelli et al., 2018; Qu, 2025]. Less developed economies feature a large mass of small firms and a scarcity of large, productive ones [Hsieh and Olken, 2014]. Tax and regulatory barriers can discourage firm expansion and distort the allocation of resources across firms [Garicano et al., 2016]. Yet measuring the regulatory costs of firm growth is challenging, as these costs are often non-monetary and not directly observable.

This paper proposes a methodology to quantify all the costs associated with size-dependent tax regimes and regulations for firms. The analysis starts from the insight that the bunching of firms immediately below a threshold (see Saez, 2010; Kleven, 2016), may reveal a discontinuity in the cost of operating, whether tax related or regulatory.[1] Holding fixed the adjustment cost of the underlying variable, more pronounced bunching points to a larger tax or regulatory burden for firms [Ewens et al., 2024]. We then map the magnitude of bunching into a monetary measure of growth costs by calibrating a profit maximization model. This measure is comparable across thresholds and across variables, and thus allows us to compare, for example, the burden associated with losing a favorable tax regime with that associated with more stringent employment protection rules.

The analysis focuses on the year 2022 and considers all tax and regulatory thresholds in force for three size measures, the ones most commonly used by legislators to differentiate tax and regulatory requirements [Schivardi and Torrini,

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[1] The methodology therefore builds on the revealed preference approach introduced by Samuelson [1948].

2008; Di Marzio et al., 2025; Accetturo et al., 2025; Fornasari et al., 2026]: revenues, total assets, and the number of employees.

Our analysis follows a data-driven approach, allowing the observed bunching of firms along each size dimension to reveal which thresholds are most relevant. We identify bunching as the deviation of the observed firm density from an estimated counterfactual density. Thresholds are then ranked according to the magnitude of bunching, thereby identifying the most burdensome policy rules. We also assess the statistical significance of bunching around actual regulatory thresholds by comparing them with placebo thresholds for which no regulation applies.

For revenues, the strongest bunching appears at the threshold that determines the loss of the flat-tax regime for sole proprietorships (*regime forfettario*), where excess mass amounts to about 29 percent of the expected mass. This is followed by the thresholds associated with the loss of simplified bookkeeping and quarterly VAT settlement. For total assets, the only threshold generating substantial bunching is the one associated with the mandatory appointment of a board of statutory auditors, for which excess mass reaches about 8.6 percent of the expected mass. The distribution of the number of employees displays less salient bunching. The response is not necessarily weaker, but is less sharply concentrated around the threshold and harder to distinguish from statistical noise. Relative to revenues and total assets, this difference may also reflect the greater difficulty firms face in adjusting employment, particularly in settings where tax avoidance or evasion makes it comparatively easier to manipulate other margins. The most pronounced bunching again occurs at the threshold triggering the mandatory appointment of a board of statutory auditors, with bunching equal to 13 percent of the expected mass, and at the fifteen employee threshold for the application of additional dismissal protections, where excess mass reaches about 9 percent.

Bunching in employment is not directly comparable to bunching in revenues or assets, as firms may find it more difficult to adjust employment than to manipulate revenues or assets. To quantify the cost associated with each threshold, and thus

compare regulations defined over different variables such as turnover based tax regimes and labor legislation, one needs a profit maximization model. The model shows that the extent of bunching depends on two factors: (a) the regulatory cost; and (b) the elasticity of the behavioral response, which measures the extent to which firms adjust the variable in question, for example revenues, in response to changes in regulatory costs, for example taxation. The model therefore maps the observed bunching (e.g. in revenues) into monetary costs once the relevant elasticity (e.g. tax elasticity of revenues) is known.

To estimate each elasticity, we exploit thresholds and the corresponding bunching estimates for which the increase in costs is directly measurable in the data. Specifically, we use the thresholds that trigger the appointment of the board of statutory auditors, whose cost can be measured as the sum of its members' fees [Fornasari et al., 2026].[2] In this case, the relationship implied by the model yields the elasticities as a function of costs and bunching estimates. Under the assumption that the resulting elasticities also apply at other thresholds, the model allows us to translate all bunching estimates in the distributions of turnover, employment, and assets into a quantification of the costs of the underlying regulations.[3] To make results comparable across thresholds and variables, we express this cost as a share of value added for firms located near each threshold.

The revenue threshold at which sole proprietorships cease to qualify for the flat tax regime is the most burdensome, with a cost equal to around 10 percent of value added. The loss of simplified bookkeeping and quarterly VAT settlement for sole proprietorships and partnerships accounts for about half as much, around 4-5 percent. These are followed by the mandatory appointment of a board of statutory

[2]The sum of fees is a measure of private costs, but net private costs should also include any private benefits to the firm. However, Fornasari et al. [2026] show that the board of statutory auditors improves neither credit access nor financing conditions, and does not raise productivity or profits. The benefits instead arise at the social level, as externalities on creditors: the board of statutory auditors reduces default risk and speeds up debt restructuring.

[3]The estimated cost is a *private* cost because firms' decisions to remain below the threshold do not internalize the externalities associated with regulation. It is also a *net* cost, because it represents the difference between the costs and benefits that firms perceive as associated with the regulatory regime. For example, more detailed financial reporting may benefit the firm if it improves access to credit [Accetturo et al., 2025].

auditors for private limited companies, at 2 percent, and by the application of dismissal protections for firms with at least 15 employees, at 1 percent. By contrast, our estimates suggest that the costs associated with changes in financial reporting regimes, workforce reporting requirements, the mandatory hiring of disabled workers, changes in contribution rates for unemployment benefit schemes, and the loss of small-medium enterprise incentives are quantitatively negligible.

This paper contributes to the bunching literature that uses discontinuities in observed distributions to infer behavioral elasticities [Saez, 2010; Kleven and Waseem, 2013; Kleven et al., 2014; Kleven, 2016; Best and Kleven, 2018; Citino et al., 2025] and regulatory costs [Ewens et al., 2024]. It also speaks to the literature on the effects of regulation on firm growth by showing how regulatory obligations generate distortions along different firm size margins [Schivardi and Torrini, 2008; Garicano et al., 2016; Di Marzio et al., 2025; Brugnara et al., 2025; Miglino et al., 2026]. Using an optimization model and a data-driven approach, our main contribution is to develop a method for quantifying the costs of firm growth at every regulatory threshold across the full distributions of several variables. While we apply the method to Italy, the framework is general and can be used to evaluate the costs of size-dependent regulations in any country, provided that the distribution of the relevant size variable is observed and the cost of at least one such regulation is known.

The remainder of the paper is organized as follows. Section 2 describes the data. Section 3 presents the methodology used to estimate bunching. Section 4 reports and compares bunching estimates along each variable. Section 5 introduces the theoretical models, and Section 6 presents the estimates of the costs associated with each regulation. Section 7 concludes.

2 Data

Administrative data on the number of employees and revenues are drawn from the Istat Frame SBS dataset, which provides annual firm-level information on location and sector, employment size, revenues and costs, value added and gross operating surplus, as well as exports and imports of goods. This data covers the universe of active Italian firms. Information on total assets is not available in the Frame SBS dataset and is therefore drawn from balance-sheet data provided by *Cerved group* for limited companies (*società di capitali*) only.

The analysis focuses on 2022, the latest year for which both sources are available. In 2022, Frame SBS contains information on revenues and the number of employees for 4,551,747 firms, including sole proprietorships, partnerships, and limited companies. In the same year, the Cerved dataset contains information on total assets for 803,289 limited companies.

For the calibration exercise described in Section 6.1, we also use the following datasets for the same year: (i) *AnaCredit*, to obtain the average gross interest rate applied to non-financial companies; (ii) the *National Accounts*, to calibrate the national average depreciation rate [Istat, 2025] and the rate of change in the value of investment goods; and (iii) *Infocamere* data on the number of members of the board of statutory auditors in each firm, which we use to estimate its average cost following Fornasari et al. [2026].

3 Methodology for estimating bunching

The goal of the bunching analysis is to estimate the net regulatory cost that a size dependent regulation imposes on each firm, denoted by Δt. The term Δt captures both direct regulatory costs, such as fees paid to statutory auditors, and indirect costs, such as productivity losses arising from the reallocation of resources needed to comply with regulatory requirements. It is a *net* cost because it incorporates any benefits generated by the regulation. For example, the cost of rules requiring more

detailed financial reporting is measured net of the benefit of improved access to credit arising from greater transparency [Accetturo et al., 2025]. It is also a *private* cost because firms do not internalize the externalities generated by regulation, such as its effects on worker welfare or financial stability [Ewens et al., 2024].[4]

To measure bunching, one must first construct the counterfactual firm density that we would observe in the absence of the regulatory threshold. We denote this density by $h^0(z)$, corresponding to the black dashed line in Figure 1. To do so, we estimate a flexible polynomial that fits the observed firm distribution (the blue line), excluding the data within a window around the threshold z^* and extrapolating the counterfactual distribution within that window [Kleven, 2016].[5] Grouping firms into bins of revenues (or number of employees, or total assets) indexed by j, we estimate the counterfactual distribution using the following regression:

$$c_j = \sum_{i=0}^{p} \beta_i \cdot (z_j)^i + \sum_{i=z_-}^{z_+} \gamma_i \cdot \mathbf{1}[z_j = i] + \nu_j, \tag{1}$$

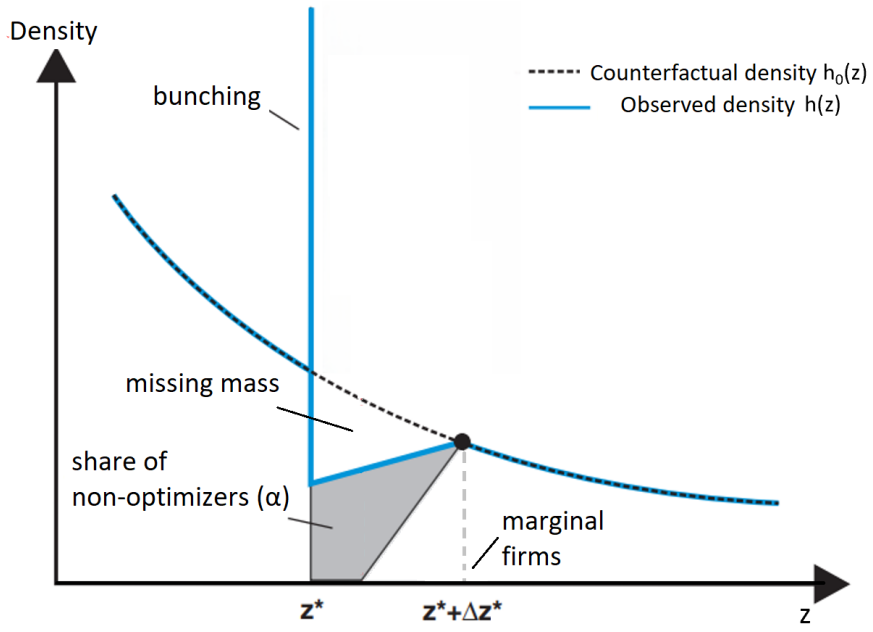
where c_j is the number of firms in bin j, z_j is the average value of the running variable in bin j, $[z_-, z_+]$ is the excluded window around the threshold, and p is the degree of the polynomial. The window around the threshold must include both the bunching mass immediately below the threshold and the missing mass immediately above it.[6] The missing mass extends to the marginal firms located at $z^* + \Delta z^*$, which are indifferent between bunching just below the threshold and operating above it at $z^* + \Delta z^*$ (Figure 1).

[4] A full assessment of the effectiveness of a regulation would require comparing its total social costs with its total social benefits. This exercise lies beyond the scope of this paper.

[5] In the empirical analysis, we use a seventh degree polynomial for all variables.

[6] In this paper, we focus on regulations whose cost increases *above* a size threshold, inducing firms to cluster *below* it.

Figure 1: Bunching: illustrative graph



Notes: Source: Kleven [2016]

We estimate the number of firms in each bin j of the counterfactual distribution using the coefficients from the regression, omitting the contribution of the indicators for the excluded region, that is, $\hat{c}_j = \sum_{i=0}^{p} \hat{\beta}_i \cdot (z_j)^i$. Bunching is then estimated as the difference between the observed and the counterfactual number of firms below the threshold, within the excluded window: $\hat{B} = \sum_{i=z\_}^{z^*} (c_j - \hat{c}_j)\mathbf{1}[z_j = i]$.

4 Estimates of bunching

We consider the main size-dependent regulations in Italy as of 2022: the flat-tax regime for the self-employed; simplified bookkeeping and quarterly VAT settlements; financial statements requirements; the mandatory appointment of a board of statutory auditors; incentive schemes for small and medium sized enterprises; contribution rates for wage.supplementation schemes in case of firm crises (bilateral solidarity funds, FIS and CIG); dismissal protections; transparency require-

ments (biennial workforce report); and mandatory hiring quotas for protected categories (see Appendix A for details). For each of these regulations, summarized in Table 1, crossing a threshold raises firms' regulatory or fiscal burden. Financial reporting rules, SME incentives, and the board of statutory auditors requirement depend on multidimensional criteria. In those cases, we analyze bunching for the same regulation along each of the three relevant dimensions.[7] Section 6 explains how we exploit the multidimensional nature of the board of statutory auditors thresholds to obtain a reference cost for each variable, which makes the estimated costs of all regulatory thresholds comparable.

Table 1: Main regulatory thresholds by variable (2022)

Regulation	**Revenues**	**Assets**	**Employees**
Loss of flat-tax regime	65,000 €		
Loss of simplified bookkeeping (services)	400,000 €		
Loss of simplified bookkeeping (other sectors)	700,000 €		
Abbreviated financial statements	350,000 €	175,000 €	5
Board of statutory auditors	4,000,000 €	4,000,000 €	20
Ordinary financial statements	8,800,000 €	4,400,000 €	50
Loss of SME incentives	50,000,000 €	43,000,000 €	250
Bilateral solidarity fund / FIS			5
Dismissal protections			15
CIG			50
7% disabled workers, biennial workforce report			50

Notes: Thresholds are those in force in 2022. The appointment of the board of statutory auditors becomes mandatory when only one of the three thresholds is exceeded for two consecutive fiscal years. Financial reporting rules become mandatory when two out of three thresholds are exceeded for two consecutive fiscal years.

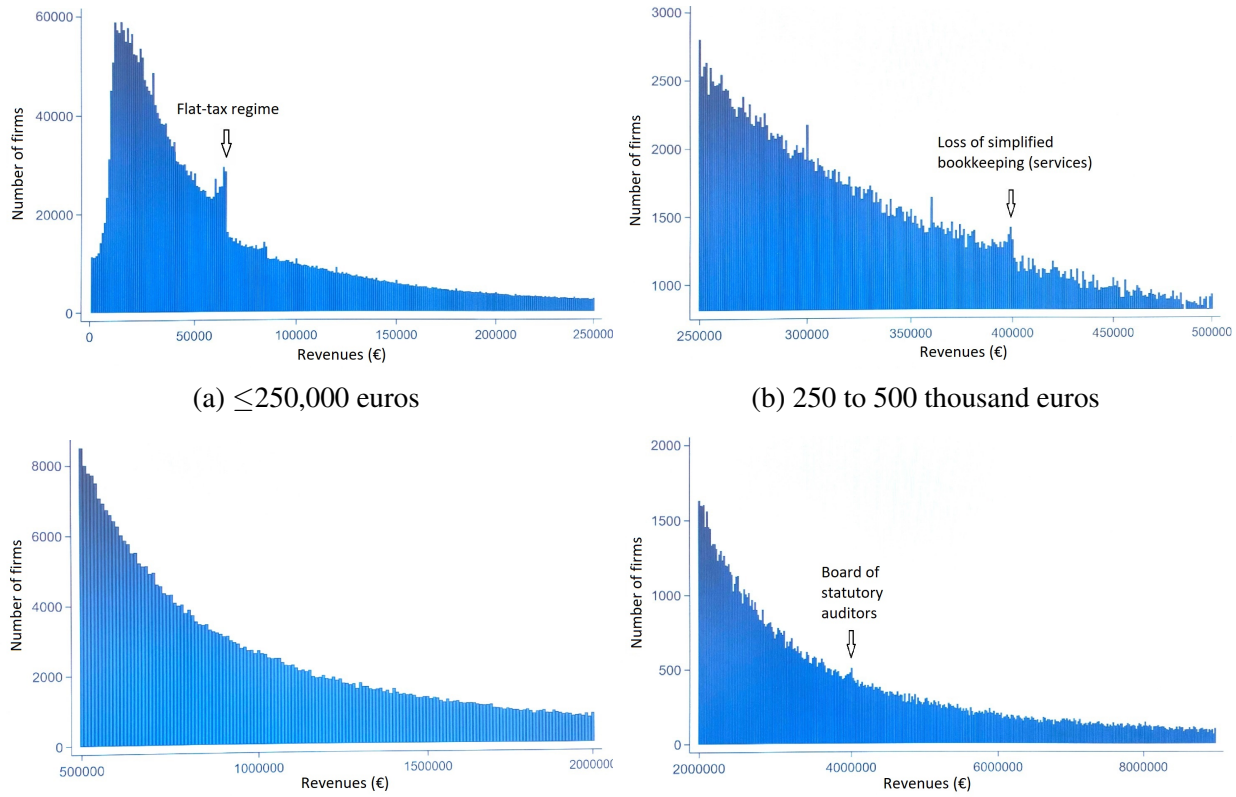
Revenues. The distribution of revenues exhibits clearly visible discontinuities in firm density. The strongest bunching appears at 65 thousand euros, which in 2022 was the threshold separating the flat-tax regime from the ordinary regime for sole proprietorships (Figure 2a).[8] Bunching is also visible at the 400 thousand euro

[7] We do not analyze the revenue and asset thresholds for the loss of SME incentives because they lie in the far right tail of the firm size distribution and only 1 percent of firms are located above them, making empirical identification of bunching uninformative.

[8] We also observe an incipient bunching of firms around the 85 thousand euro threshold, in anticipation of the increase in the flat-tax threshold in 2023.

threshold (Figure 2b), which implies for sole proprietorships and partnerships in the services sector the loss of eligibility for simplified bookkeeping and the obligation to settle VAT monthly rather than quarterly. By contrast, we do not find visible bunching at the simplified bookkeeping threshold that applies to other sectors, namely 700 thousand euros. Finally, there is also visible bunching of firms at the 4 million euro threshold that triggers the mandatory appointment of a board of statutory auditors (Figure 2d).

Figure 2: Distribution of firms by revenues



(a) ≤250,000 euros

(b) 250 to 500 thousand euros

(c) 500 thousand to 2 million euros

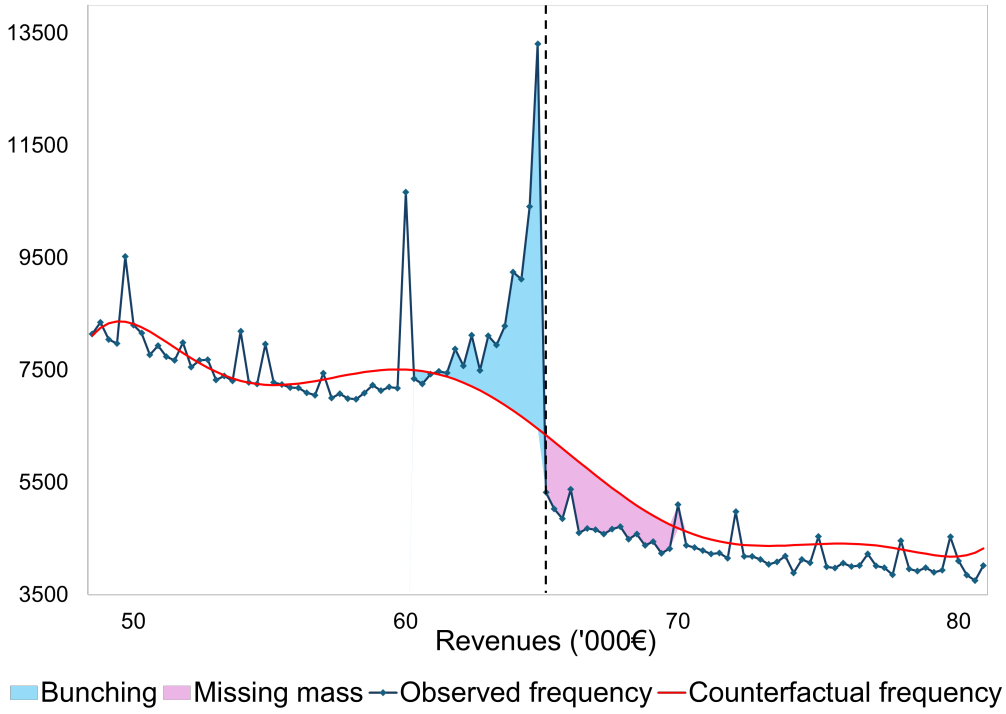
(d) 2 to 9 million euros

Notes: The figures report the number of firms in 2022 by revenue class. Each bar in panels (a) and (b) represents a 1,000 euro bin. In panel (c), each bar represents a 10,000 euro bin, and in panel (d) a 20,000 euro bin. Authors' calculations based on Frame SBS data [ISTAT, 2020].

The 350 thousand and 8.8 million euro thresholds for the transition from micro-firm financial statements to abbreviated financial statements, and from abbreviated to ordinary financial statements for limited companies, do not show visible dis-

continuities. However, histogram evidence over the full distribution may conceal bunching, especially when the phenomenon is modest. For this reason, we next focus on a local window around each threshold.

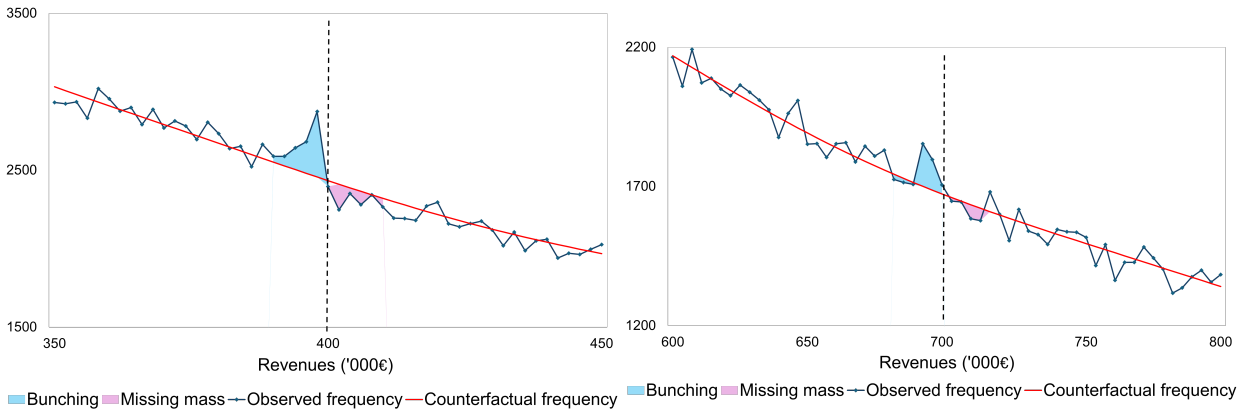
Figure 3: Bunching at the revenue threshold for the flat-tax regime



The excess mass of firms below the flat-tax threshold (the blue area in Figure 3) is equal to 29 percent of the counterfactual mass that would have been observed in the absence of regulation over the same support region (the area under the red line).

The excess mass of firms below the thresholds for the loss of simplified book-keeping and quarterly VAT settlement (Figure 4) amounts to 3.7 and 2.3 percent of the counterfactual mass for services and other sectors, respectively. The excess mass below the threshold for the mandatory appointment of the board of statutory auditors (Figure A1) amounts to 1.3 percent of the corresponding expected mass.

Figure 4: Bunching at revenue thresholds for simplified bookkeeping and quarterly VAT settlement



(a) Services (b) Other sectors

By contrast, there is no excess mass below the thresholds governing the transition from micro-firm financial statements to abbreviated financial statements (Figure A2a) and from abbreviated to ordinary financial statements (Figure A2b).

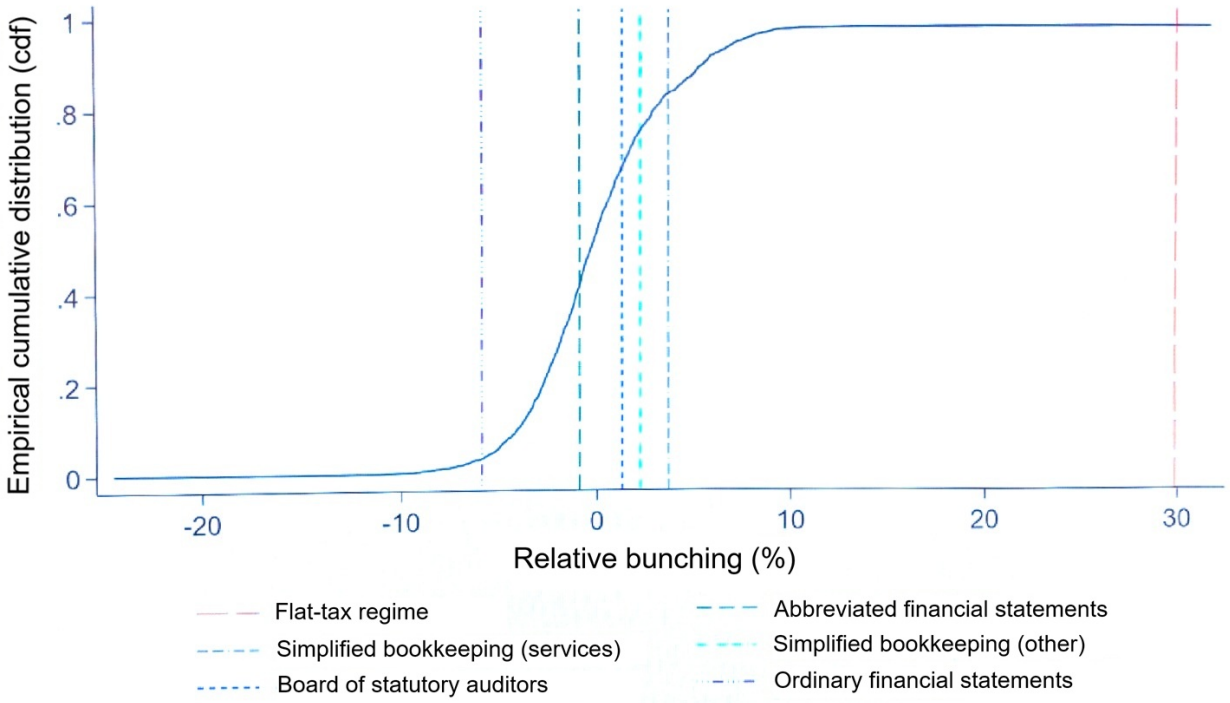
To assess whether these estimates are meaningful and not merely driven by statistical noise, we conduct a placebo test by estimating bunching at artificial thresholds distributed along the full revenue distribution. Specifically, we estimate bunching at 5,000 euro intervals (placebo thresholds) over the entire revenue distribution in 2022, from 10 thousand euros up to 9 million euros, and normalize it by dividing by the expected firm mass in that region absent bunching.[9] We then rank the bunching estimates at placebo and actual thresholds by magnitude, and Figure 5 shows their cumulative distribution. This allows us to compare bunching near true thresholds, where a regulation is in force, with bunching near placebo thresholds, where no regulation applies.

The more pronounced the bunching at a threshold, the further to the right its estimate appears in the figure. For example, the threshold associated with the loss of the flat-tax regime (the orange dashed line in Figure 5) is the furthest to the right, because the estimated bunching at that threshold exceeds 99.9 percent of the bunching estimates at all other thresholds, whether placebo or actual. The simpli-

[9] Some placebo thresholds, for example 60,000 euros, capture part of the bunching generated by nearby true thresholds, such as the flat-tax threshold at 65,000 euros.

fied bookkeeping thresholds have bunching larger than more than 80 percent of the other thresholds, and the board of statutory auditors threshold has bunching larger than 70 percent of the others. The bunching estimates for changes in financial reporting regimes are not positive because bunching is entirely absent.

Figure 5: Placebo test: empirical cdf of revenue bunching



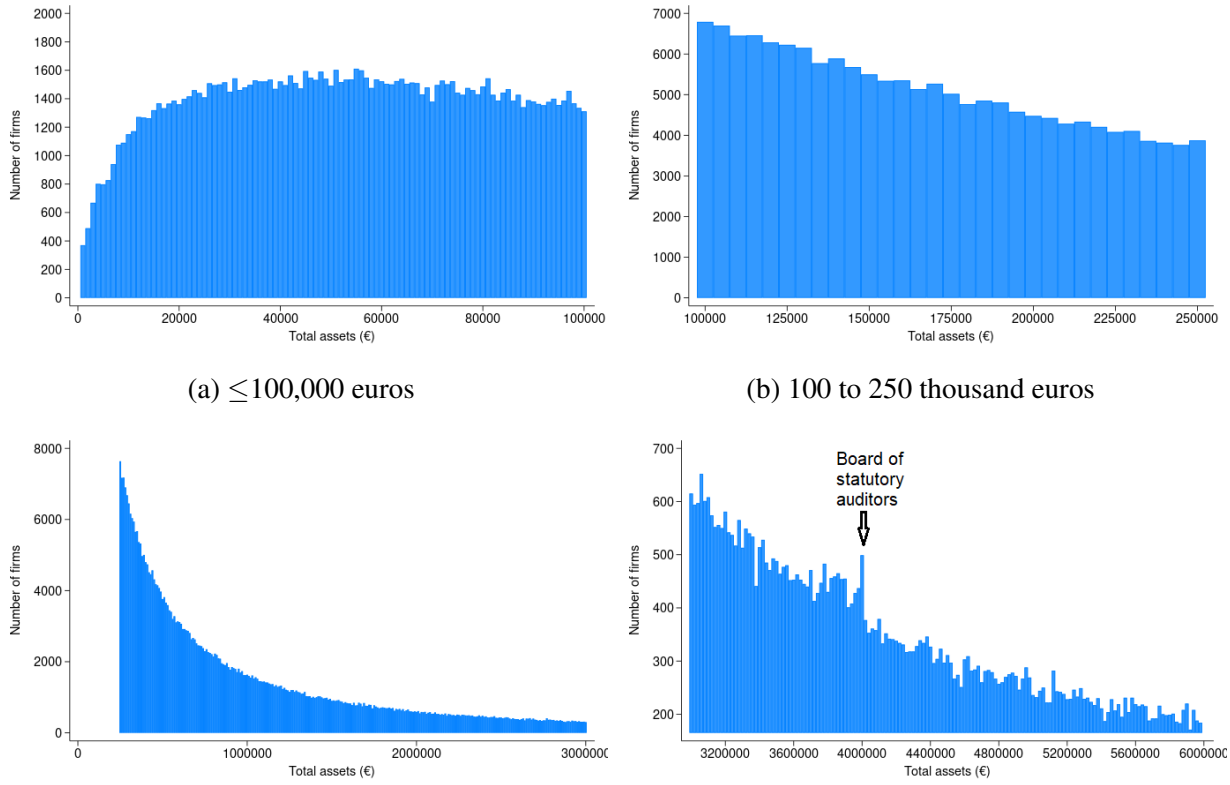
Notes: Bunching estimates from 10 thousand to 9 million euros in 5,000 euro increments. Bin width j is the maximum of €1000 and 0.5% of the threshold: $z_{j+1} - z_j = \max\{100, 0.005 * z^*\}$. The bunching window is 5% of the threshold on both sides: $[z_-, z_+] = [z^* \cdot (1 - 0.05), z^* \cdot (1 + 0.05)]$. The sample used to estimate the counterfactual density h_0 consists of all firms with revenues in $[z^* \cdot (1 - 0.25), z^* \cdot (1 + 0.25)]$. Relative bunching measures the excess mass of firms below the threshold as a percentage of the counterfactual mass in the same support region.

Total assets. The distribution of total assets shows a clear discontinuity in firm density at the 4 million threshold in 2022 (Figure 6d). For limited liability companies, this corresponds to the mandatory appointment of a board of statutory auditors.[10] Looking across the full distribution, we do not observe any bunching at the other two regulatory thresholds: the transition from micro-firm financial

[10]Since 2020, the board of statutory auditors requirement applies when a company's total assets exceed 4 million euros in each of the previous two fiscal years [Fornasari et al., 2026].

statements to abbreviated statements (175 thousand euros) and the transition from abbreviated to ordinary statements (4.4 million euros).[11]

Figure 6: Distribution of limited companies by total assets



(a) ≤100,000 euros

(b) 100 to 250 thousand euros

(c) 250 thousand to 1 million euros

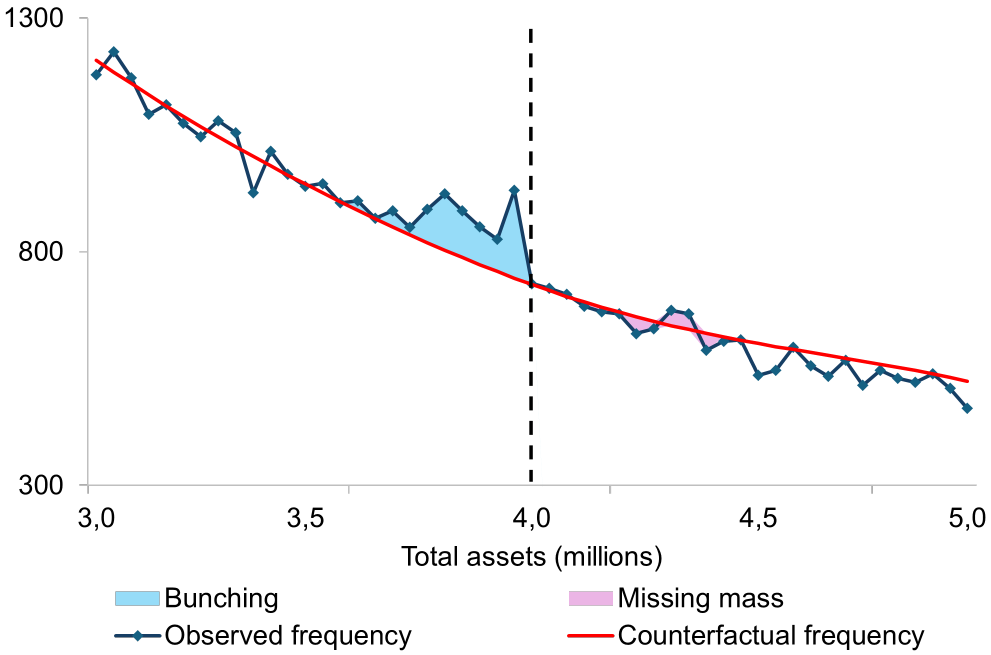
(d) 3 to 5 million euros

Notes: The figures report the number of limited companies in 2022 by asset class. In panel (a), each bar represents a 1,000 euro bin; in panel (b), a 5,000 euro bin; in panel (c), a 10,000 euro bin; and in panels (d) and (e), a 20,000 euro bin. Authors' calculations based on Cerved data.

The excess mass of firms below the threshold for the board of statutory auditors (the blue area in Figure 7) is equal to 8.6 percent of the expected mass (the area under the red line).

[11]From 2016 to 2022, micro-firm financial statements were allowed for firms that had not exceeded two of the following three thresholds in each of the previous two fiscal years: total assets of 175,000 euros, revenues of 350,000 euros, and average employment of 5 workers. For abbreviated financial statements, the thresholds through 2022 were total assets of 4.4 million euros, revenues of 8.8 million euros, and average employment of 50 workers [Accetturo et al., 2025].

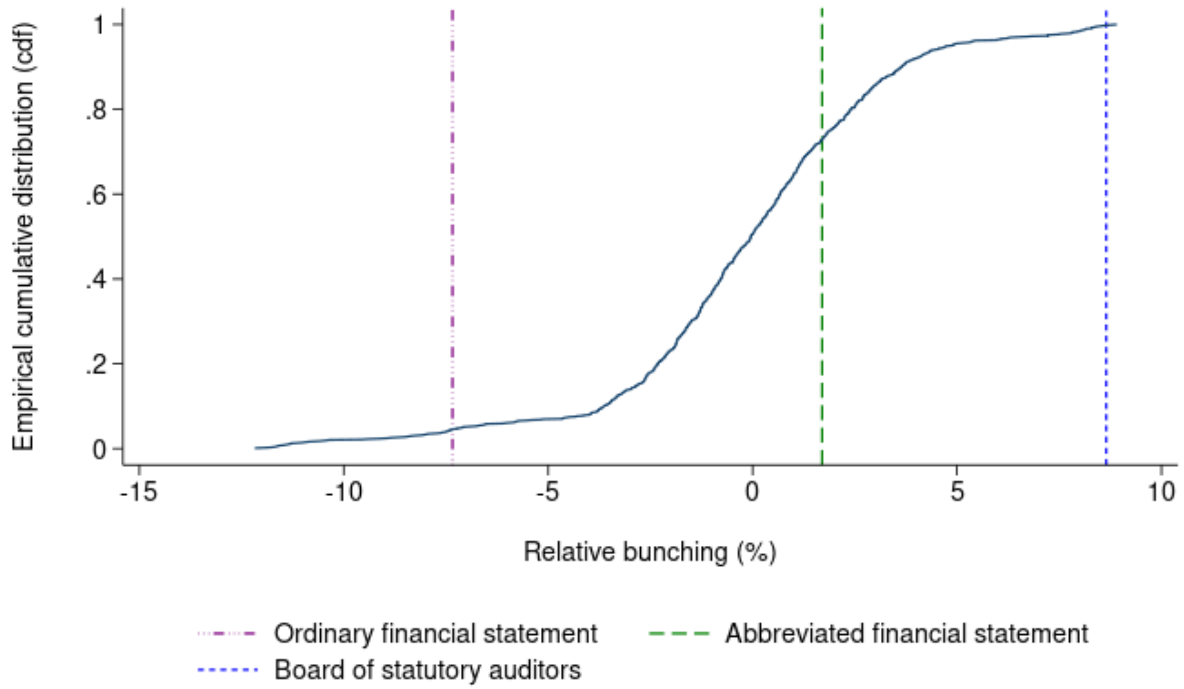
Figure 7: Bunching at the asset threshold for the board of statutory auditors



Focusing on a narrower window around the thresholds for financial reporting requirements reveals modest bunching that was not visible in Figure 6. The excess mass below the threshold governing the transition from micro-firm to abbreviated financial statements (Figure A3a) amounts to 1.7 of the corresponding counterfactual mass.

For the placebo test on total assets, we estimate bunching at 5,000 euro intervals along the total asset distribution from 100 thousand euros to 5 million euros in 2022 and normalize it by the expected firm mass. Figure 8 shows that the board of statutory auditors threshold has larger bunching than 99.8 percent of all other thresholds. The thresholds associated with changes in the financial reporting regime are close to zero or negative, reflecting weaker or absent bunching.

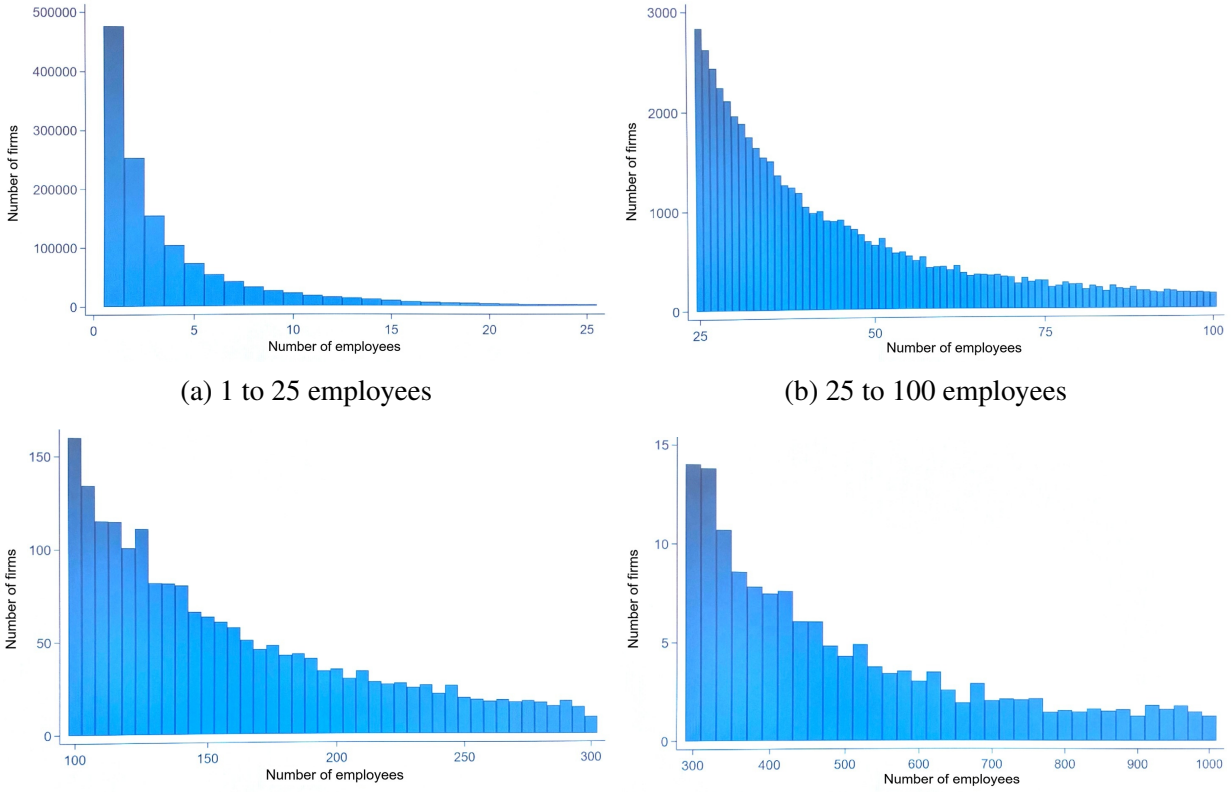
Figure 8: Placebo test: empirical cdf of total-asset bunching



Notes: Bunching estimates from 100 thousand to 5 million euros of total assets in 5,000 euro increments. Bin width j is the maximum of €1000 and 1% of the threshold: $k_{j+1} - z_j = \max\{1000, 0.01 * k^*\}$. The bunching window is 10% of the threshold on both sides: $[k_-, k_+] = [k^* \cdot (1 - 0.1), z^* \cdot (1 + 0.1)]$. The sample used to estimate the counterfactual density h_0 consists of all firms with assets in $[k^* \cdot (1-0.4), k^* \cdot (1+0.4)]$. Relative bunching measures the excess mass of firms below the threshold as a percentage of the counterfactual mass in the same support region.

Number of employees. The most relevant employment thresholds are 5, 15, 20, 50, and 250 employees. Not exceeding 5 employees is one of the criteria for being allowed to prepare micro-firm financial statements rather than abbreviated statements. The same threshold also changes the contribution rate to the bilateral solidarity fund for professional activities and to the wage integration fund (Appendix Section A). Firms with more than 15 employees are subject to stronger protections against unfair dismissal, reinstatement rules, and collective rights obligations.

Figure 9: Distribution of firms by number of employees



(a) 1 to 25 employees

(b) 25 to 100 employees

(c) 100 to 300 employees

(d) 300 to 1,000 employees

Notes: The figures report the number of firms in 2022 by employment class. In panels (a) and (b), each bar represents one employee; in panel (c), each bar represents a 5 employee bin; and in panel (d), a 20 employee bin. Authors' calculations based on Frame SBS data [ISTAT, 2020].

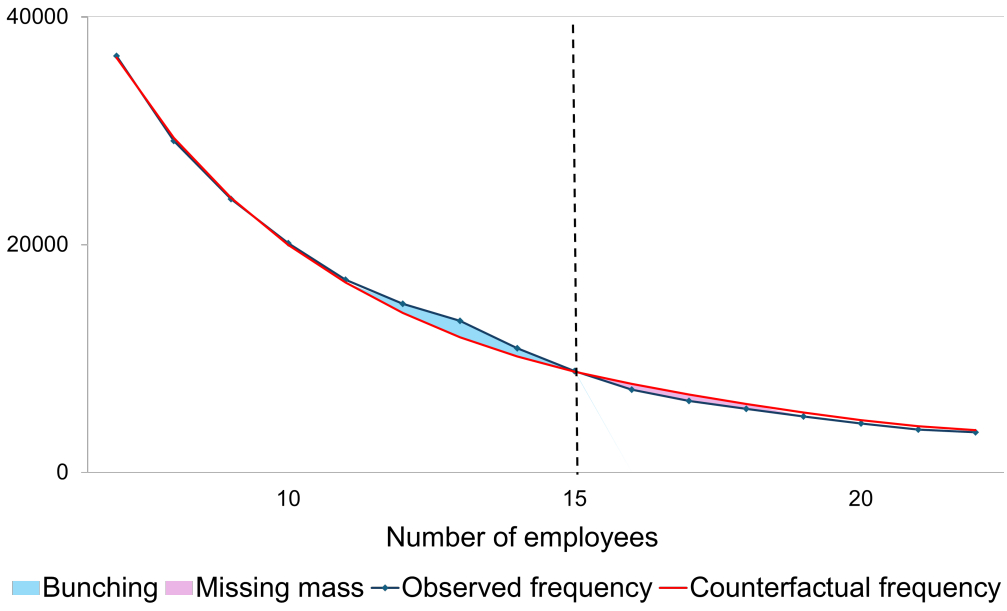
At 20 employees, the appointment of a board of statutory auditors becomes mandatory. Firms with more than 50 employees must reserve at least 7 percent of their workforce for disabled workers, must prepare ordinary financial statements and a biennial workforce report. At the same threshold, the ordinary contribution rate for wage supplementation in case of firm crises (CIG) also increases. At 250 employees, the European definition of a large firm applies, with the resulting loss of access to SME incentives and support schemes.

Figures 9a-9d do not show salient discontinuities in firm density along the employment distribution. This could reflect the inherently discrete nature of the variable, which tends to generate less bunching immediately below thresholds than

for continuous variables such as total assets and revenues. Firms may also find it more difficult to adjust employment rather than to manipulate revenues or assets. Once we focus on narrow neighborhoods around the thresholds, however, some evidence of bunching emerges.

Near the board of statutory auditors threshold (Figure A4), the excess mass of firms amounts to 13 percent of the corresponding counterfactual mass in the same support region (the area under the red line). The excess mass below the 15 employee threshold, which is relevant for worker protection in case of dismissal (the blue area in Figure 10), represents 9 percent of the expected mass in the same support region.

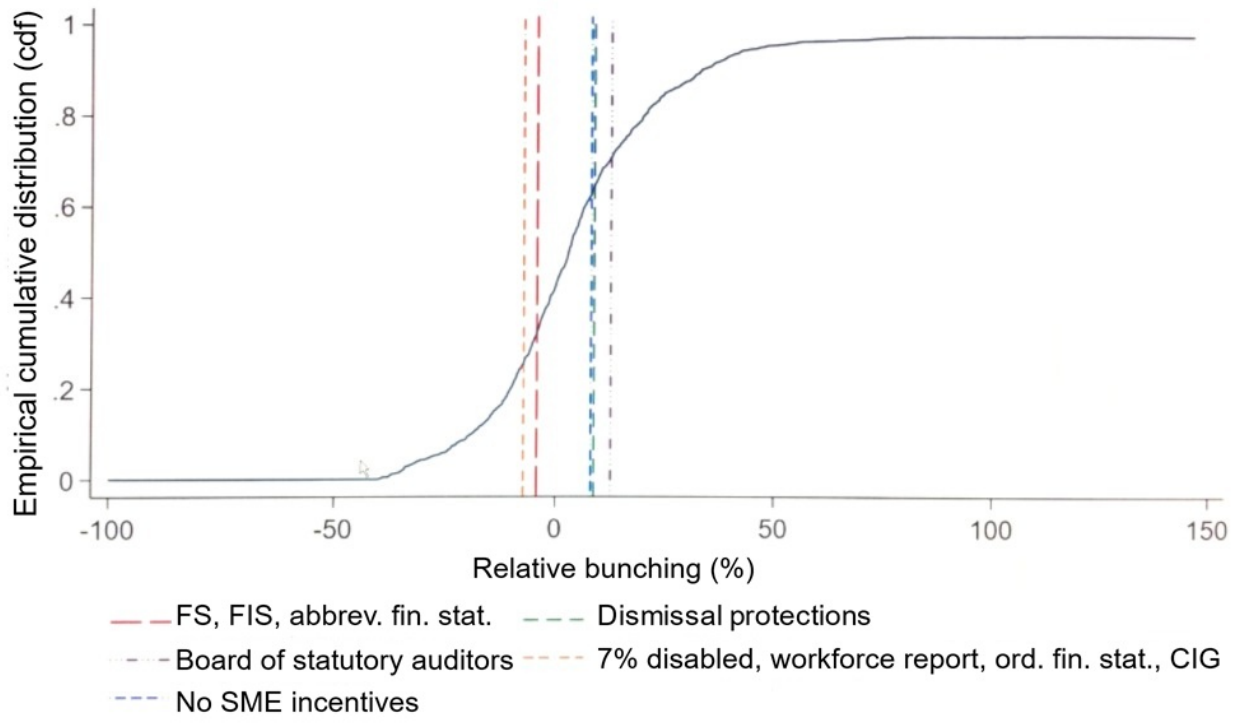
Figure 10: Bunching at the 15 employee threshold for dismissal protections



Finally, the excess mass immediately below the 250 employee threshold, associated with SME incentives (the blue area in Figure A6), is equal to 8 percent of the expected mass absent regulation. By contrast, we find no evidence of bunching near the 5 employee threshold, which affects micro-firm financial statements, the contribution rate to the bilateral solidarity fund and the wage integration fund, nor at the 50 employee threshold, which introduces mandatory hiring obligations, ordinary financial statements, the biennial workforce report, and higher wage-

supplementation contributions (Figures A7 and A5).

Figure 11: Placebo test: empirical cdf of employment bunching



Notes: Bunching estimates from 5 to 1,000 employees for each integer threshold. Bin width j is 1. The bunching window is 5% of the threshold, or at least 2 employees, on both sides: $[\ell_-, \ell_+] = [\ell^* \cdot (1-0.05), \ell^* \cdot (1+0.05)]$. The sample used to estimate the counterfactual density h_0 consists of all firms with employment in $[\ell^* \cdot (1-0.25), \ell^* \cdot (1+0.25)]$. Relative bunching measures the excess mass of firms below the threshold as a percentage of the counterfactual mass in the same support region.

For the placebo test on the number of employees, we estimate bunching at every integer employment level from 5 to 1,000 employees in 2022 and normalize it by the expected mass of firms. Figure 11 shows that the threshold associated with the mandatory appointment of a board of statutory auditors exhibits a level of bunching greater than 75 percent of the other thresholds considered, while the thresholds for dismissal protections and the loss of SME incentives both lie above the 70th percentile of the distribution. By contrast, there is no excess mass at the 5 and 50 employee thresholds, for which estimated bunching is not positive. Overall, bunching below thresholds based on the number of employees is less

distinguishable from statistical noise than that observed below the main revenue and asset thresholds.

5 Theoretical model

To obtain estimates of regulatory costs, we embed the bunching estimates in a profit or utility maximization model in which the entrepreneur chooses revenues, total assets, and employment. We propose two distinct models: in the first, the choice variable is revenues; in the second, the choice variables are the factors of production, capital and labor. Although the decision variable differs across the two models, the theoretical implications are symmetric.

5.1 The model with revenue choice

The model in which the entrepreneur chooses revenues follows Kleven and Waseem [2013] and Kleven [2016], who use it to estimate the elasticity of taxable income. Consider an entrepreneur who earns revenues z and pays taxes and regulatory costs $T(z)$. The entrepreneur chooses revenues z to maximize utility:

$$\max_{z} \; u(z) = z - T(z) - \left(\frac{z}{a}\right)^{1+\frac{1}{e}} \tag{2}$$

The parameter $e = \frac{\partial \ln z}{\partial \ln(1-t_z)}$ denotes the elasticity of revenues with respect to the net-of-tax rate, as explained in Appendix Section B. Because utility is assumed to be quasi-linear, there are no income effects and the elasticity is, by construction, compensated and positive [Saez, 2010; Kleven and Waseem, 2013; Kleven, 2016]. Generating revenues requires entrepreneurial effort, which entails a utility cost equal to $\left(\frac{z}{a}\right)^{1+\frac{1}{e}}$, decreasing in ability a.

Suppose that at the revenue threshold z^*, a regulation takes effect that causes a discrete increase in regulatory or tax costs. This increase may take the form of a rise in the average tax rate, for example when moving from the flat-tax regime to

the ordinary regime, or of an increase in average regulatory costs, as in the case of the mandatory appointment of the board of statutory auditors. Total tax and regulatory costs can be written as:

$$T(z) = t_z\, z + \Delta t_{z^*}\, z \cdot \mathbf{1}(z > z^*)$$

where t is the average regulatory cost or average tax rate below the threshold and Δt_{z^*} is its discrete increase above the threshold z^*, that is, the average cost of the regulation expressed as a share of revenues.[12]

Solving the model (Appendix Section B) yields a closed-form expression for the increase in regulatory costs Δt_{z^*} associated with threshold z^*:

$$\Delta t_{z^*} = (1 - t_z) \left\{ 1 - \left[\frac{1+e}{1 + \Delta z^*/z^*} - e \left(\frac{1}{1 + \Delta z^*/z^*} \right)^{1+1/e} \right]^{1/(1+e)} \right\} \tag{3}$$

The formula expresses the increase in average regulatory costs at the threshold as a function of the elasticity e and the relative distance of the marginal entrepreneur from the threshold, $\Delta z^*/z^*$.

To obtain the latter, note that the excess mass of firms below the threshold, B, corresponds to the set of taxpayers who, absent the threshold, would have had revenues between z^* and Δz^* (Figure 1):

$$B = (1 - \alpha_{z^*}) \int_{z^\star}^{z^\star + \Delta z^\star} h^0(z)\, dz \simeq (1 - \alpha_{z^*})\, h^0(z^\star)\, \Delta z^\star,$$

where $h^0(z)$ is the expected density in the absence of the regulatory threshold (the black dashed line in Figure 1). Following Kleven and Waseem [2013], we assume that only a fraction $1 - \alpha_{z^*}$ of entrepreneurs responds optimally to the threshold, while a fraction α_{z^*} does not adjust revenues, for example because of

[12] Regulatory costs are not necessarily proportional to revenues, as assumed in the model. We approximate them locally as such in the neighborhood of the threshold.

inattention or because not all firms are willing to engage in accounting adjustments (the gray area in Figure 1).[13] In the presence of such frictions, the observed bunching B is generated only by optimizers. Hence, $\frac{\Delta z^*}{z^*} \simeq \frac{B}{(1-\alpha)h^0(z^*)z^*}$ can be measured by estimating bunching and the counterfactual density at the threshold, $h^0(z^*)$, using the method described in Section 3.

The share of non optimizers α_{z^*} is an estimated as the ratio of the observed density to the right of the threshold (the blue line between z^* and $z^* + \Delta z^*$) to the expected density to the right of the threshold (the dashed line over the same interval).[14] The intuition is that if all firms responded optimally, the region immediately to the right of the threshold would be empty. Firms just above the threshold are therefore interpreted as non optimizers.

Note that the larger the increase in regulatory costs, the larger the excess mass of firms below the threshold relative to the expected density, that is, the larger the bunching.[15] Equation (3) can therefore be used to estimate regulatory costs at revenue thresholds, Δt_{z^*}, given an estimate of the elasticity e. Conversely, when the regulatory cost at one threshold is known, as in the case of the board of statutory auditors, the same equation (3) can be used to estimate the elasticity from the cost.[16]

[13] In the presence of a notch, that is, a discrete change in the tax rate or average cost, all firms located in a neighborhood above the threshold should bunch. If some do not move, this reflects non optimization: the excess mass is attenuated and the behavioral elasticity is underestimated. Correcting for the share of non optimizers rescales the excess mass to the fraction of firms that actually respond.

[14] The parameter α is exogenous in the model, as it does not depend from a choice of the entrepreneur. However, since it can vary with the observed density to the right of each threshold, α captures informational frictions and the degree of rational inattention among entrepreneurs in a reduced form, while preserving the tractability of the model.

[15] From equation (3), we obtain:

$$\frac{d\,\Delta t_{z^*}}{d\left(\frac{\Delta z}{z}\right)} = (1-t_z)\left[\frac{1+e}{1+\frac{\Delta z}{z}} - e\left(\frac{1}{1+\frac{\Delta z}{z}}\right)^{1+\frac{1}{e}}\right]^{-\frac{e}{1+e}}\left[\frac{1-\left(\frac{1}{1+\frac{\Delta z}{z}}\right)^{\frac{1}{e}}}{\left(1+\frac{\Delta z}{z}\right)^2}\right] > 0$$

[16] Equation (3) does not admit a closed form solution for the elasticity as a function of the cost. However, the elasticity can be recovered numerically as the solution to the same equation.

5.2 The model with capital and labor choice

In this model, firms no longer choose taxable income, but production factors: labor, measured by the number of employees, and capital, measured by total assets.[17] While the theoretical implications are symmetric to those of the revenue-choice model, the relevant elasticities differ: the elasticity of labor demand with respect to wages and the elasticity of capital demand with respect to the user cost of capital.

Let $T_\ell(\ell)$ denote the regulatory cost associated with the number of workers and $T_k(k)$ the cost associated with capital. Firms are heterogeneous in total factor productivity A. We study firm behavior around labor and capital thresholds, $\ell^\star$ and $k^\star$, respectively.

A discrete increase in regulatory costs at the labor threshold $\ell^\star$ or the capital threshold $k^\star$ is modeled as:

$$T_\ell(\ell) = t_\ell\,\ell + \Delta t_{\ell^\star}\,\ell \cdot \mathbf{1}\{\ell \geq \ell^\star\}, \qquad T_k(k) = t_k\,k + \Delta t_{k^\star}\,k \cdot \mathbf{1}\{k \geq k^\star\}$$

Let $h^0_\ell(\ell)$ and $h^0_k(k)$ denote the counterfactual firm densities with respect to labor and capital in the absence of thresholds.

The firm maximizes profits by choosing capital and labor:

$$\max_{k,\ell} \pi(k,\ell;A) = A\,k^{1-\frac{1}{\eta}}\,\ell^{1-\frac{1}{\gamma}} - r\,k - w\,\ell - T_k(k) - T_\ell(\ell) \tag{4}$$

where w is the average wage and r is the user cost of capital. We assume a Cobb-Douglas production function.

In the absence of discrete increases in regulatory costs ($\Delta t_{\ell^\star} = \Delta t_{k^\star} = 0$), the first order conditions imply:

$$\gamma = -\frac{\partial \ln \ell}{\partial \ln(w + t_\ell)}, \qquad \eta = -\frac{\partial \ln k}{\partial \ln(r + t_k)}$$

[17] For simplicity, we assume that total assets coincide with capital. In practice, total assets also include intangible and financial components. The model's implications are unchanged if productive capital is a fixed share of total assets and firms face user and regulatory costs on total assets (see Appendix Section D).

where γ and η represent the elasticities of labor and capital demand with respect to their respective prices, in the absence of adjustment frictions. For output to increase in both labor and capital and for the production function to exhibit non increasing returns to scale, it is necessary that $\gamma \geq 1$ and $\eta \geq 1$.[18]

Solving the model (Appendix Section C) yields a closed-form expression for the increase in regulatory costs at the labor threshold:

$$\Delta t_{\ell^\star} = (w + t_\ell) \left\{ \left[\frac{1-\gamma}{1+\frac{\Delta \ell^\star}{\ell^\star}} + \gamma \left(\frac{1}{1+\frac{\Delta \ell^\star}{\ell^\star}} \right)^{1-\frac{1}{\gamma}} \right]^{\frac{1}{1-\gamma}} - 1 \right\} \tag{5}$$

Let B_ℓ denote the mass of firms bunching immediately below threshold $\ell^\star$. Following Kleven and Waseem [2013], we assume only a fraction $1 - \alpha_{x^*}$ of firms actively optimizes in response to the regulatory threshold. In the presence of frictions:

$$B_\ell = (1 - \alpha_{\ell^\star}) \int_{\ell^\star}^{\ell^\star + \Delta \ell^\star} h_\ell^0(\ell) \, \mathrm{d}\ell \simeq (1 - \alpha_{\ell^\star}) h_\ell^0(\ell^\star) \Delta \ell^\star$$

Hence, $\frac{\Delta \ell^\star}{\ell^\star} \simeq \frac{B_\ell}{(1-\alpha_{\ell^\star}) h_\ell^0(\ell^\star) \ell^\star}$ can be obtained by estimating bunching, the counterfactual density, and the share of non optimizers using the methods described above.

By symmetry, the increase in regulatory costs at the capital threshold $k^\star$ is:

$$\Delta t_{k^\star} = (r + t_k) \left\{ \left[\frac{1-\eta}{1+\frac{\Delta k^\star}{k^\star}} + \eta \left(\frac{1}{1+\frac{\Delta k^\star}{k^\star}} \right)^{1-\frac{1}{\eta}} \right]^{\frac{1}{1-\eta}} - 1 \right\} \tag{6}$$

Equations (5) and (6) therefore allow us to recover the regulatory costs associated with labor and capital thresholds using the elasticities and the observed bunching.[19] Whenever the regulatory cost at a threshold is known, as in the case

[18] Given the conditions $\gamma \geq 1$ and $\eta \geq 1$, the profit function is concave in (k, ℓ) and admits an interior optimum if technology exhibits non increasing returns to scale, that is, if $\frac{1}{\gamma} + \frac{1}{\eta} \geq 1$.

[19] If productive capital represents a constant share of total assets and the user cost and regulatory costs are incurred

of the board of statutory auditors, the same equations can be inverted numerically to estimate the elasticity.

6 Estimates of elasticities and regulatory costs

To estimate the elasticities and the costs associated with each regulation, we proceed as follows:

1. We calibrate the model parameters r, w, t_z, t_l, t_k;
2. We compute, for firms near the thresholds at which the requirement applies (4 million in assets, 4 million in revenues, 20 employees), the average cost of the board of statutory auditors Δt_z^*, Δt_l^*, and Δt_k^*, measured as the sum of its members' fees [Fornasari et al., 2026];
3. Using the parameters calibrated in step (1), the costs of statutory auditors computed in step (2), and the bunching and counterfactual densities at the board of statutory auditors thresholds estimated in Section 4, we invert equations (3), (5), and (6) to estimate the three elasticities e, γ, η;
4. Using the parameters calibrated in step (1), the elasticities estimated in step (3), and the bunching and counterfactual densities at all other thresholds estimated in Section 4, we use equations (3), (5), and (6) to estimate the regulatory costs Δt_z^*, Δt_l^*, and Δt_k^* at the remaining thresholds.

6.1 Calibration of the parameters

The user cost of capital is the sum of the nominal interest rate and the depreciation rate for Italian firms, net of the rate of change in the value of investment

on total assets, equation (6) remains unchanged. If instead assets satisfy $x = \psi K^{\phi}$, where ϕ measures the elasticity of assets with respect to capital, the same equation continues to hold after replacing η with $s = \frac{\phi\eta}{1-\eta+\phi\eta}$ (see Appendix Section D).

goods: $r = i + \delta - \phi$. The national average depreciation rate for plant, machinery, and equipment in 2022 was $\delta = 0.079$, according to the National Accounts [Istat, 2025].[20] The rate of change in the value of investment goods, $\phi = 0.010$, is computed as the average across sectors of the rates of change in investment deflators, weighted by the number of firms, using National Accounts data for 2022 to 2023. In December 2022, the average gross interest rate on new term loans to firms was $i = 0.057$ according to AnaCredit data. We therefore calibrate $r = 0.057 + 0.079 - 0.010 = 0.126$.

For the tax rate on assets t_k, we use the 0.76 percent rate on real estate values (IMU) in 2022 to 2023 and calibrate $t_k = 0.0076$.[21]

According to Cerved data for 2022, the average gross wage was 34,667 euros, so we calibrate $w + t_l = 34667$.

For the rate on revenues t_z, we use the Italian corporate tax rates (IRAP and IRES), taking into account that their tax bases do not coincide with revenues.[22] For limited companies around the board of statutory auditors threshold, average tax payments are 114,701 euros for IRAP and 55,675 euros for IRES, implying an average tax rate on revenues at the threshold of $t_z^* = (55675+114701)/4000000 = 0.043$.

6.2 Computing the costs of the board of statutory auditors

To estimate the elasticity associated with each variable and anchor regulatory costs to an observable value, we use thresholds for which the increase in costs is directly measurable in the data. In particular, we exploit the thresholds that trigger the mandatory appointment of the board of statutory auditors, whose cost is measured

[20] It is computed as the ratio of depreciation to the gross stock of plant, machinery, and equipment, as in Mistretta and Zollino [2018].

[21] In Italy there is no tax levied on the full stock of firms' assets. The tax on real-estate held by firms applies only to one component of total assets, which is why our calibration incorporates this component. The estimates remain very similar if we instead calibrate $t_k = 0$.

[22] To compute tax liabilities, we apply the standard IRAP rate of 3.9 percent to value added net of labor costs and the IRES rate of 24 percent to profits before tax.

as the sum of its members' fees [Fornasari et al., 2026].[23] We compute the average cost of the board of statutory auditors for firms near the relevant threshold that triggers the requirement: 4 million in assets, 4 million in revenues, and 20 employees. Using Cerved data on limited companies, the cost of the board of statutory auditors in a neighborhood of the 4 million revenue threshold is on average 18,298 euros, that is, $E[\Delta t_{z^*}|z^* = 4000000] = \frac{18298}{4000000} = 0,0046$.[24] The cost of the board of statutory auditors in a neighborhood of the 4 million euro asset threshold is on average 17,119 euros, while around the 20 employee threshold it is 21,637 euros, yielding $E[\Delta t_{k^*}|k^* = 4000000] = 0,0043$ and $E[\Delta t_{\ell}|\ell^* = 20] = 1081,85$.

6.3 Estimates of behavioral elasticities

Using the parameters calibrated in Section 6.1, the costs of statutory auditors computed in Section 6.2, and the bunching and counterfactual densities at the thresholds of the board of statutory auditors estimated in Section 4, we can invert equations (3), (5), and (6) to estimate the elasticities of the three variables.

For revenues, employment, and assets, the relevant elasticities are: (i) the elasticity of revenues with respect to the average tax rate, e; (ii) the elasticity of labor demand with respect to the gross wage, γ; and (iii) the elasticity of capital demand with respect to the user cost of capital, η. This exercise relies on the assumption that each elasticity is constant over the entire distribution of the corresponding variable, an assumption needed to identify all regulatory costs.

Our estimate of the elasticity of revenues with respect to the net-of-tax rate is 0.01. Using Danish administrative data, Kleven and Schultz [2014] estimate this elasticity to range from 0.02 to 0.30 depending on the size of the tax reforms considered. Similarly, using a bunching approach, Chetty et al. [2011] find that for self employed individuals the elasticity of taxable income is below 0.01 in the presence of small tax changes, but rises to about 0.18 for the largest tax notch.

[23] We assume that the compensation of statutory auditors is set at the midpoint of the range established by Article 29 of Ministerial Decree 140/2012, which depends on the level of total assets and net revenues reported by each company.

[24] The interval around threshold z^* is $[z^* \cdot 0.95, z^* \cdot 1.05]$.

Our estimate of the elasticity of labor demand with respect to labor costs, equal to $-\gamma = -1{,}09$, is large in absolute value relative to most available microeconomic estimates, which typically range from $-0{,}15$ to $-0{,}75$ [Hamermesh, 1993; Lichter et al., 2015; Popp, 2023], though not without precedent. Values close to one emerge, for example, in Beaudry et al. [2018], who estimate a labor demand elasticity with respect to wages of about -1 using U.S. city industry data. Studies for France suggest even larger employment responses to discrete changes in labor costs: Kramarz and Philippon [2001] estimate elasticities around $-1{,}5$ for low wage workers, while Cahuc et al. [2019] estimate elasticities close to -4 for groups affected by hiring tax credits.

Table 2: Elasticities: our estimates compared to the literature

Elasticity	**Our estimate**	**Literature**
Revenue with respect to the net-of-tax rate	0.01	0.02–0.30 [Kleven and Schultz, 2014]; 0.00–0.18 [Chetty et al., 2011].
Labor demand with respect to labor cost	-1.09	-0.15–-0.75 [Hamermesh, 1993; Lichter et al., 2015; Popp, 2023]; -1 [Beaudry et al., 2018]; -1.5 [Kramarz and Philippon, 2001]; -4 [Cahuc et al., 2019].
Capital demand with respect to user cost	-1.15	United States: -0.01 [Clark, 1993], -0.18 [Tevlin and Whelan, 2003], -0.25 [Chirinko et al., 1999], -0.8 [Schaller and Voia, 2017], -1.06–-1.33 [Cummins and Hassett, 1992]; Japan: -0.05–-0.07 [Kiyotaki and West, 1996]; Germany: -0.9 [Dwenger, 2014]; Canada: -1.4 [Schaller, 2006b].

Our estimate of the elasticity of capital demand with respect to the user cost ($-\eta$) is equal to -1.15. This value is large in absolute terms relative to short-run estimates [Schaller, 2006a], but consistent with more recent long-run estimates [Schaller, 2006b; Dwenger, 2014; Schaller and Voia, 2017]. In the United States, short-run estimates range from -0.01 [Clark, 1993] to values between -0.18 [Tevlin and Whelan, 2003] and -0.25 [Chirinko et al., 1999], and up to estimates

below -1 [Cummins and Hassett, 1992]. For Japan, Kiyotaki and West [1996] report values between -0.05 and -0.07. More recent estimates of the long-run elasticity of capital with respect to the user cost are close to -1 and can reach up to about -1.4 in some specifications [Schaller, 2006b; Dwenger, 2014; Schaller and Voia, 2017].

6.4 Estimates of regulatory costs

Using the parameters calibrated in Section 6.1, the elasticities estimated in Section 6.3, and the bunching and counterfactual densities at all thresholds estimated in Section 4, we can use equations (3), (5), and (6) to infer the regulatory cost at every other threshold. Table 3 reports estimated costs for a firm located at the threshold, both in absolute value and as a share of value added, for each regulation.[25]

It should be noted, however, that the rules governing financial statements and the board of statutory auditors depend on multidimensional and intertemporal criteria (Appendix Section A). Firms may therefore respond to these regulations along alternative margins, for example assets rather than revenues, or in the previous year. As a result, bunching measured on a single size variable captures only part of the adjustment and may attenuate estimated regulatory costs for these rules. The correction for the share of non-optimizers is also intended to compensate for this attenuation.

Any attenuation of bunching at the board of statutory auditors threshold would imply an overstatement of the ratio between the bunching at any other threshold and the bunching at the board of statutory auditors threshold. Because the cost of the board of statutory auditors is observed and fixed as the benchmark used to calibrate all other estimates, overstating this ratio would translate into a relative overstatement of the costs associated with the other regulations.

[25] To compute value added at the threshold, we calculate average value added among firms in a small interval around the threshold, namely threshold $\pm$ 5 percent, using Istat and Cerved data.

Table 3: Estimated costs by regulation

Regulation	**Threshold**	**Cost per firm at threshold (€)**	**Cost per firm at threshold (% VA)**
Loss of flat-tax regime	Revenues (65,000€)	3,838€	10.19%
Loss of simplified bookkeeping (services)	Revenues (400,000€)	7,709€	5.09%
Loss of simplified bookkeeping (other)	Revenues (700,000€)	10,075€	4.05%
Board of statutory auditors	Assets (4,000,000€)	17,119€	1.92%
Board of statutory auditors	Employees (20)	21,721 €	1.75%
Board of statutory auditors	Revenues (4,000,000€)	18,298€	1.61%
Dismissal protections	Employees (15)	11,743€	1.32%
Abbreviated financial statements	Assets (175,000€)	96€	0.14%
Loss of SME incentives	Employees (250)	244 €	0.01%
Ordinary financial statements	Assets (4,400,000€)	0€	0%
Abbreviated financial statements	Revenues (350,000€)	0€	0%
Ordinary financial statements	Revenues (8,800,000€)	0€	0%
FS; abbreviated fin. statements	Employees (5)	0€	0%
7% disabled workers, workforce report; Ordinary fin. statements; CIG	Employees (50)	0€	0%

Bearing these considerations in mind, we estimate that the most burdensome threshold is the one implying the loss of the flat-tax regime for sole proprietorships, which imposes a burden equal to 10 percent of value added on firms around the threshold. This is followed by the loss of simplified bookkeeping and quarterly VAT settlement for sole proprietorships and partnerships, at 4 to 5 percent; the mandatory appointment of a board of statutory auditors for private limited companies, at almost 2 percent; and the application of worker protections for firms with at least 15 employees, at around 1 percent. In the absence of substantial bunching below the remaining thresholds, we estimate that the other regulations imply net costs that are essentially negligible.

7 Conclusions

This paper develops a method to measure the regulatory costs that hinder firm growth by exploiting discontinuities in the distributions of firm-size variables, such as employment, assets, and revenues, around tax and regulatory thresholds.

Embedding bunching estimates in a profit maximization model and anchoring the analysis with at least one directly observed regulatory cost, we can compare the costs of all size-dependent regulations defined over different firm-size variables.

The results reveal substantial heterogeneity in the costs associated with size-dependent frictions. The most burdensome regulations, in descending order, are the loss of the flat-tax regime for sole proprietorships, the loss of simplified bookkeeping and quarterly VAT settlement for sole proprietorships and partnerships, the mandatory board of statutory auditors, and the increase of dismissal protections beyond fifteen employees. Other regulatory thresholds, including financial reporting rules, workforce obligations, disabled-worker hiring requirements, contribution rates for wage-supplementation schemes, and the loss of SME incentives, generate negligible net costs.

The estimated costs of growth should be interpreted as measures of net private costs, as they do not account for the externalities associated with regulation, for example in terms of worker protection, financial stability, or resource allocation. A full evaluation of the effectiveness of regulation would therefore require a joint analysis of social costs and social benefits. Overall, this paper shows that certain tax and regulatory thresholds have a tangible impact on firms' growth decisions, contributing to the persistent fragmentation of the production system in a developed economy.

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Appendix A Institutional background: regulatory thresholds

This Appendix describes the main tax and regulatory thresholds in force in 2022 that are considered in the analysis, associated with revenues, total assets, and the number of employees, together with the related regulatory obligations.

Flat-tax regime. The flat-tax regime, in force since January 1, 2015, provides VAT and applies a 15-percent tax to a fixed share of revenues, rather than the higher taxes ordinarily levied on income. The regime also grants eligible firms access to an optional social contribution regime. The maximum revenue limit for eligibility was set at 65,000 euros from 2019 to 2022 and was raised to 85,000 euros by the 2023 budget law.

Simplified bookkeeping and quarterly VAT settlement. Simplified bookkeeping entails less burdensome accounting rules than ordinary bookkeeping. In particular, it allows firms to use cash accounting rather than accrual accounting and exempts them from keeping some accounting books. Firms are eligible for simplified bookkeeping if revenues do not exceed 400,000 euros in services and 700,000 euros in other sectors. The same thresholds applied for eligibility to pay, on a quarterly rather than monthly basis, the difference between VAT charged to customers on goods and services sold and VAT paid to suppliers. This regime reduces administrative burdens and is particularly suited to firms with irregular cash flows, that is, when output and input VAT do not accrue within the same month. As of 2023, these thresholds were raised to 500,000 and 800,000 euros, respectively.

Board of statutory auditors. Statutory auditors have the institutional mandate to monitor legal compliance and financial soundness of the firm. They are external auditors paid by the firm and appointed every three years. The obligation to appoint a board of statutory auditors applies to firms that have exceeded for two consecutive fiscal years at least one of the following thresholds: 4 million euros in

total assets, 4 million euros in revenues, or an average of twenty employees during the fiscal year.

Micro-firm financial statements, abbreviated financial statements, and ordinary financial statements. Italian civil law provides for different levels of detail in financial reporting depending on firm size. Micro-firms may prepare financial statements consisting only of a balance sheet and profit and loss account in a simplified form and, under certain conditions, may omit the notes to the accounts, the management report, and the cash-flow statement. This regime applies to firms that do not exceed, for two consecutive fiscal years, at least two of the following thresholds: 220 thousand euros in total assets, 440 thousand euros in revenues (before 2024, 175 thousand and 350 thousand euros, respectively), or 5 employees.

Abbreviated financial statements apply to firms that do not exceed, for two consecutive fiscal years, at least two of the following thresholds: 5.5 million euros in assets, 11 million euros in revenues (4.4 and 8.8 million euros, respectively, before 2024), and 50 employees. Under this regime, some balance sheet and profit and loss items may be aggregated, the cash flow statement may be omitted, and, under certain conditions, the management report and parts of the notes may also be omitted. Firms that exceed the relevant thresholds must prepare ordinary financial statements.

Contribution rate to the bilateral solidarity fund and the wage integration fund. The bilateral solidarity fund (FS) for professional activities covers sectors and firms that do not benefit from the ordinary or extraordinary wage-guarantee fund (CIGO/CIGS). Where such funds have not been established, the wage integration fund (FIS), introduced in 2015, applies and covers all employers, including those not organized as firms, with at least one employee. FS and FIS pay wage integration benefits to employees with dependent employment contracts affected by a reduction in working hours or suspension of activity. Employers that employed on average up to five

workers during the previous semester pay an ordinary contribution of 0.50 percent, reduced to 0.30 percent from 2025 provided they have not requested wage integration benefits in the previous 24 months, while employers that employed more than five workers pay an ordinary contribution of 0.80 percent. For solidarity funds, an additional 1 percent contribution applies above 15 employees.

Contribution rate to the ordinary wage guarantee fund. The ordinary wage-guarantee fund (CIGO) for industry and construction supplements or replaces the earnings of workers whose activity has been suspended or reduced due to temporary business circumstances not attributable to the firm or the employees, including adverse weather conditions and temporary market conditions. It is financed by an ordinary contribution equal to 1.70 percent of pensionable earnings for employees of industrial firms and for white collar workers and supervisors in construction and stone industries with up to 50 employees, and 2 percent above this threshold. CIGO financing also includes an experience-rated contribution that declines for firms with lower past use and is not linked to the number of employees.

Dismissal protections. The Workers' Statute provides stronger protections against dismissal for firms with more than 15 employees. For workers hired before the entry into force of the Jobs Act in 2015, reinstatement was required in the event of unlawful dismissal, later replaced by monetary compensation. In addition, above fifteen employees firms face higher contribution rates, mandatory hiring of one worker from protected categories, and the recognition of trade-union rights, including the right to ten hours of assembly per year.

Biennial workforce report. Firms with more than 50 employees must submit every two years a report on workforce conditions with reference to gender equality. The report includes aggregate information on hiring, training, promotions, and job separations, and must be sent to the Ministry of Labor and Social Policies. Firms with

no more than 50 employees may submit it on a voluntary basis.

Loss of SME incentives. At the European level, small and medium enterprises are defined as firms with up to 250 employees, revenues up to 50 million euros, or a total assets up to 43 million euros. Within this group, firms may also be classified as micro-firms, with up to ten employees and turnover or balance sheet total up to 2 million euros, and small firms, with up to 50 employees and turnover or balance sheet total up to 10 million euros. With the objective of promoting their growth, SMEs are eligible for specific support and incentive programs. At the European level, the Single Market Programme (2021 to 2027) supports schemes related to entrepreneurship, new business opportunities including market access, the strengthening of industrial ecosystem competitiveness, and the development of industrial value chains. At the national level, SMEs have access to the Guarantee Fund of the Ministry of Enterprises and Made in Italy, which provides guarantees on loans granted by banks and other financial intermediaries.

Appendix B Derivations for the model with revenue choice

Below the threshold ($z \leq z^*$), the first order condition for utility maximization is:

$$1 - t_z = (1 + \frac{1}{e}) \left(\frac{z}{a}\right)^{1/e}. \tag{7}$$

Hence, e represents the elasticity of revenues with respect to the net-of-tax rate:

$$e = \frac{\partial \ln z}{\partial \ln(1 - t_z)} > 0 \tag{8}$$

The marginal entrepreneur is the entrepreneur who, in the presence of the threshold, is indifferent between locating at the threshold z^* and locating above the threshold at some $z^I > z^*$. In the absence of the threshold, the marginal entrepreneur would choose revenues equal to $z^* + \Delta z^*$. Consider the utility of the marginal entrepreneur at the threshold z^*:

$$u^* = (1 - t_z)z^* - \left(\frac{z^*}{z^* + \Delta z^*}\right)^{1+\frac{1}{e}}. \tag{9}$$

The utility of the marginal entrepreneur if choosing to stay above the threshold is:

$$u^I = (1 - t_z - \Delta t_{z^*})z^I - \left(\frac{z^I}{z^* + \Delta z^*}\right)^{1+\frac{1}{e}}.$$

From the first order condition, we obtain:

$$z^I = \frac{(z^* + \Delta z^*)^{1+e} \, (1 - t_z - \Delta t_{z^*})^e}{(1 + 1/e)^e}$$

The corresponding utility at the interior optimum z^I is therefore:

$$u^I = \frac{1}{e} \frac{(1 - t_z - \Delta t_{z^*})^{1+e} (z^* + \Delta z^*)^{1+e}}{(1 + 1/e)^{1+e}}. \tag{10}$$

In the counterfactual without the threshold, the marginal entrepreneur chooses

revenues equal to $z^* + \Delta z^*$, and the first order condition is:

$$(z^* + \Delta z^*)^{1+\frac{1}{e}} = \frac{(1+\frac{1}{e})}{(1-t_z)}(z^* + \Delta z^*)^{1/e} \tag{11}$$

The marginal entrepreneur must be indifferent between bunching and not bunching: $u^* = u^I$. Substituting (9) to (11) and rearranging yields:

$$\frac{1}{1+\Delta z^*/z^*} - \frac{1}{1+1/e}\left[\frac{1}{1+\Delta z^*/z^*}\right]^{1+1/e} - \frac{1}{1+e}\left[1 - \frac{\Delta t_{z^*}}{1-t_z}\right]^{1+e} = 0 \tag{12}$$

This relationship implicitly defines the link between elasticity e, the relative distance of the marginal entrepreneur from the threshold $\frac{\Delta z^*}{z^*}$, and the change in the average regulatory cost or average tax rate $\frac{\Delta t_{z^*}}{1-t_z}$. Rearranging (12) yields equation (3) for the increase in regulatory costs Δt_{z^*}.

Appendix C Derivations for the model with capital and labor choice

Consider the marginal firm that, in the presence of a threshold ℓ^*, is indifferent between choosing employment equal to the threshold $\ell^\star$ or a higher level $\ell^I > \ell^\star$. In the absence of the threshold, this firm would have chosen employment equal to $\ell^\star + \Delta\ell^\star$. Let π^I denote the profit of the marginal firm when it is above the threshold and chooses ℓ^I, and let $\pi^\star$ denote profit when the firm locates at the threshold and chooses ℓ^*. The marginal firm is indifferent, so $\pi^\star = \pi^I$.

The profit of the marginal firm at threshold ℓ^* is:

$$\pi^* = (A^* + \Delta A^*)\, {k^*}^{1-\frac{1}{\eta}}\, {\ell^*}^{1-\frac{1}{\gamma}} - rk^* - w\ell^* - T_k(k^*) - t_\ell \ell^*. \tag{13}$$

where k^* is the optimal capital stock when the marginal firm chooses employment equal to ℓ^*.

The profit of the marginal firm if it locates above the threshold is:

$$\pi_I = (A^* + \Delta A^*)\, k_I^{1-\frac{1}{\eta}}\, \ell_I^{1-\frac{1}{\gamma}} - rk_I - (w + t_\ell + \Delta t_{\ell^*})\ell_I.$$

where k_I is the optimal capital stock when the marginal firm chooses employment equal to ℓ_I.

The first order condition implies:

$$\ell_I = \frac{(w + t_\ell + \Delta t_{\ell^*})^{-\gamma}}{\left[(A^* + \Delta A^*) k_I^{1-\frac{1}{\eta}} (1 - \frac{1}{\gamma})\right]^{-\gamma}},$$

and profit becomes:

$$\pi_I = -\left[(A^* + \Delta A^*)\, k_I^{1-\frac{1}{\eta}}\, (1 - \frac{1}{\gamma})\right]^{\gamma} (w + t_\ell + \Delta t_{\ell^*})^{1-\gamma} \left(\frac{1}{\gamma - 1}\right) - rk_I - T_k(k_I). \tag{14}$$

The marginal firm in the counterfactual without the threshold satisfies the fol-

lowing first order condition:

$$\left[(A^* + \Delta A^*)(1 - \frac{1}{\gamma})\,\tilde{k}^{1-\frac{1}{\eta}}\right]^{\gamma} = (\tilde{\ell}^* + \Delta\tilde{\ell}^*)(w + t_\ell)^{\gamma}. \tag{15}$$

where $\tilde{k}$ denotes capital chosen in the counterfactual without the threshold. We use the approximation $\tilde{k} \simeq k_I \simeq k^*$, that is, capital changes only marginally as a result of the labor threshold. This approximation is equivalent to treating capital as predetermined at the moment the entrepreneur chooses the number of workers. It can be interpreted either as a short-run approximation, in which capital is nearly fixed, or as a timing assumption whereby capital is chosen before labor.

The marginal firm is indifferent, so we set (13) equal to (14) and use (15) to obtain:

$$\frac{1}{1 + \frac{\Delta l^\star}{l^\star}} + \frac{\gamma}{1-\gamma}\left[\frac{1}{1 + \frac{\Delta l^\star}{l^\star}}\right]^{1-\frac{1}{\gamma}} - \frac{1}{1-\gamma}\left(1 + \frac{\Delta t_{l^*}}{w + t_l}\right)^{1-\gamma} = 0 \tag{16}$$

This condition links the elasticity of labor demand to the increase in regulatory costs relative to wages and to the relative distance of the marginal firm from the threshold in the absence of the threshold. Rearranging (16) yields equation (5) for the increase in regulatory costs Δt_{ℓ^*}.

Appendix D Derivations for the model with total assets

Section 4 assumes that total assets coincide with productive capital. In practice, total assets also include intangible and financial components. This Section relaxes the assumption.

Productive capital as a fixed share of total assets. Let X denote total assets. Assume that productive capital is a constant share of total assets, $k = \sigma X$, and firms face

user and regulatory costs defined over total assets. In this case, firms solve:

$$\max_{X,\ell} \pi(X,\ell;A) = Z\,X^{1-\frac{1}{\eta}}\,\ell^{1-\frac{1}{\gamma}} - r\,X - w\,\ell - T_X(X) - T_\ell(\ell) \tag{17}$$

where $Z \equiv A\sigma^{1-\frac{1}{\eta}}$.

Following the same steps as in Section C, the increase in regulatory costs at the total asset threshold $X^\star$ is:

$$\Delta t_{X^\star} = (r + t_X)\left\{\left[\frac{1-\eta}{1+\frac{\Delta X^\star}{X^\star}} + \eta\left(\frac{1}{1+\frac{\Delta X^\star}{X^\star}}\right)^{1-\frac{1}{\eta}}\right]^{\frac{1}{1-\eta}} - 1\right\} \tag{18}$$

This expression is isomorphic to equation (6). Therefore, the regulatory costs estimated in Section 6 are unchanged.

Total assets as a power function of productive capital. Consider instead the case in which total assets are a power function of productive capital, $X = \psi K^\phi$, where ϕ is the elasticity of total assets with respect to productive capital. The firm's problem can again be written in terms of total assets:

$$\max_{X,\ell} \pi(X,\ell;A) = Z\,X^{1-\frac{1}{s}}\,\ell^{1-\frac{1}{\gamma}} - r\,X - w\,\ell - T_X(X) - T_\ell(\ell) \tag{19}$$

where

$$s \equiv \frac{\phi\eta}{1-\eta+\phi\eta} \quad \text{and} \quad Z \equiv A\,\psi^{-\left(1-\frac{1}{s}\right)}.$$

Proceeding as in Section C, the increase in regulatory costs at the threshold $X^\star$ becomes:

$$\Delta t_{X^\star} = (r + t_X)\left\{\left[\frac{1-s}{1+\frac{\Delta X^\star}{X^\star}} + s\left(\frac{1}{1+\frac{\Delta X^\star}{X^\star}}\right)^{1-\frac{1}{s}}\right]^{\frac{1}{1-s}} - 1\right\} \tag{20}$$

This expression is again isomorphic to equation (6), implying that the estimated regulatory costs in Section 6 are unaffected. The only difference lies in the in-

terpretation of the elasticity parameter, which now embeds the mapping between productive capital and total assets.

Appendix E Additional figures

Figure A1: Bunching at the revenue threshold for the board of statutory auditors

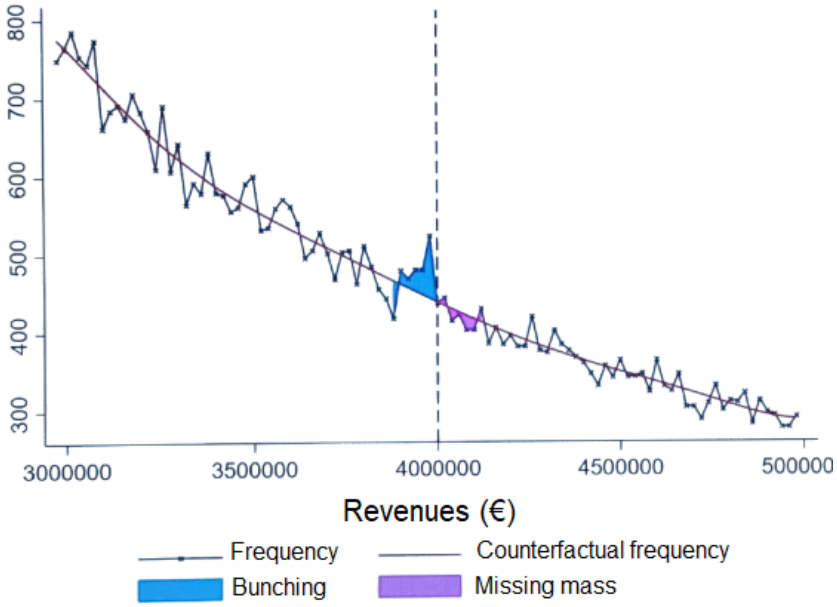
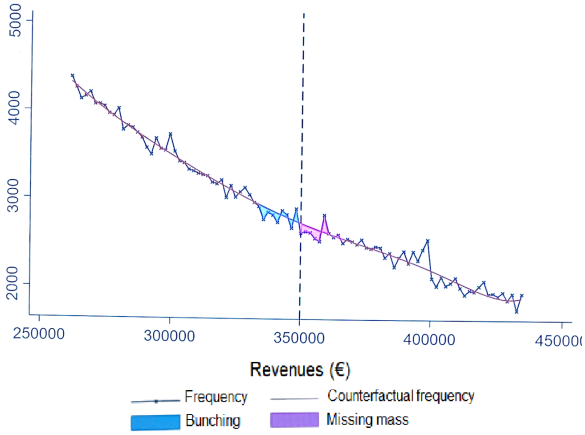
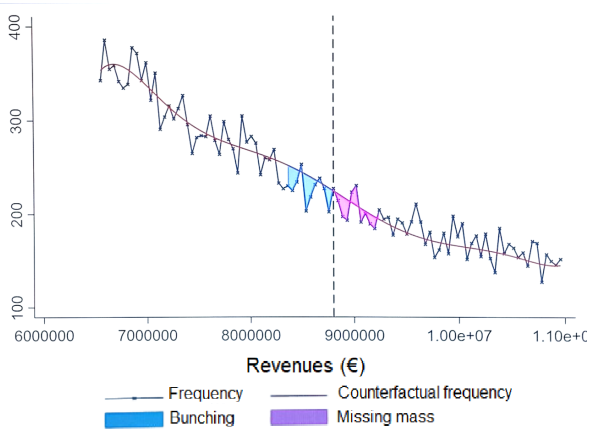


Figure A2: Bunching at the revenue thresholds for changes in the financial reporting regime

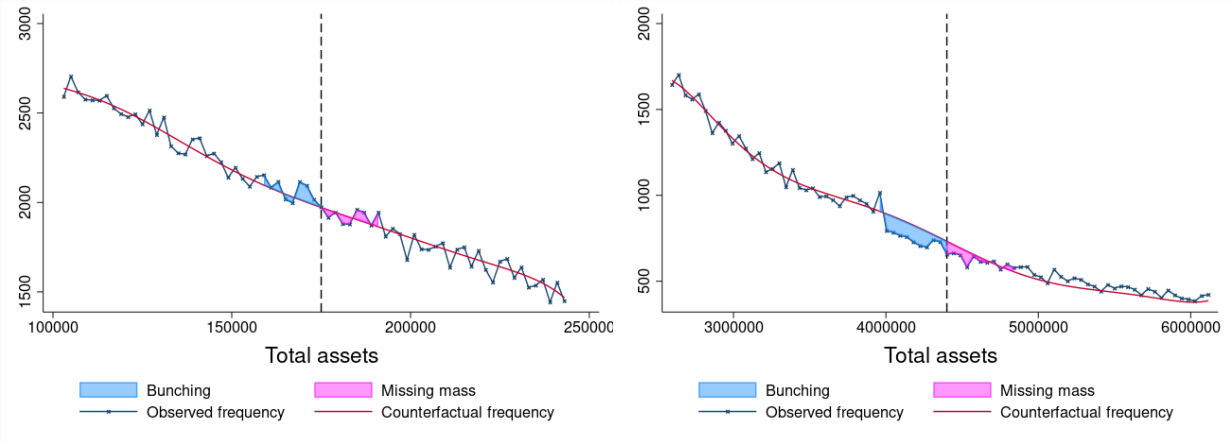


(a) From micro-firm to abbreviated statements



(b) From abbreviated to ordinary statements

Figure A3: Bunching at the asset thresholds for changes in the financial reporting regime



(a) From micro-firm to abbreviated statements

(b) From abbreviated to ordinary statements

Figure A4: Bunching at the 20 employee threshold for the board of statutory auditors

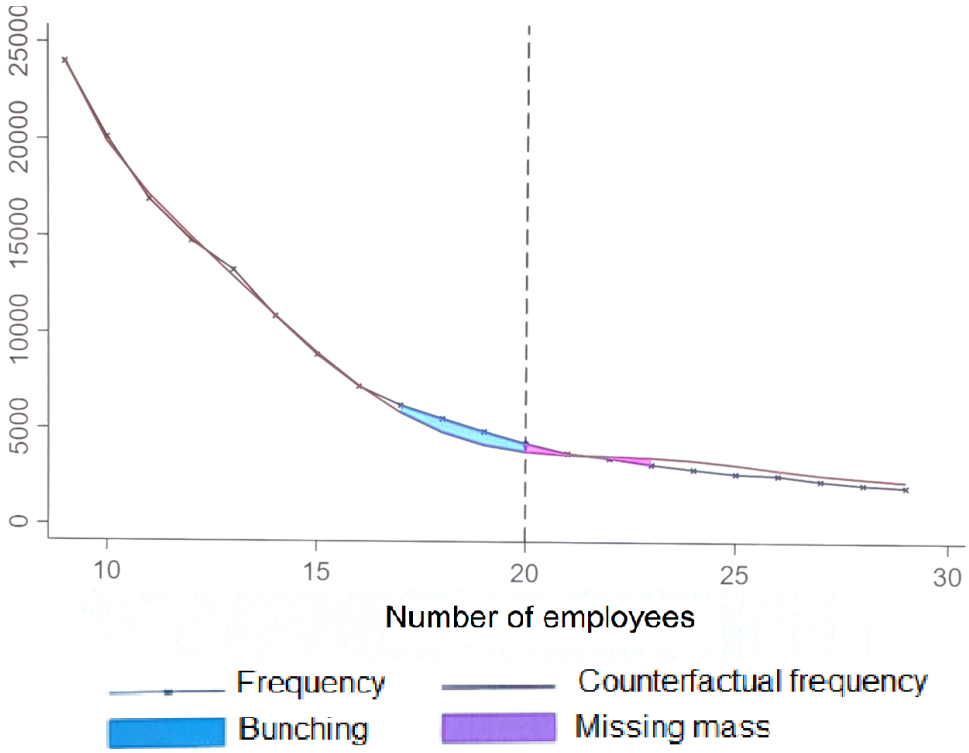


Figure A5: Bunching at the 5 employee threshold for the bilateral solidarity fund, the wage integration fund, and abbreviated financial statements

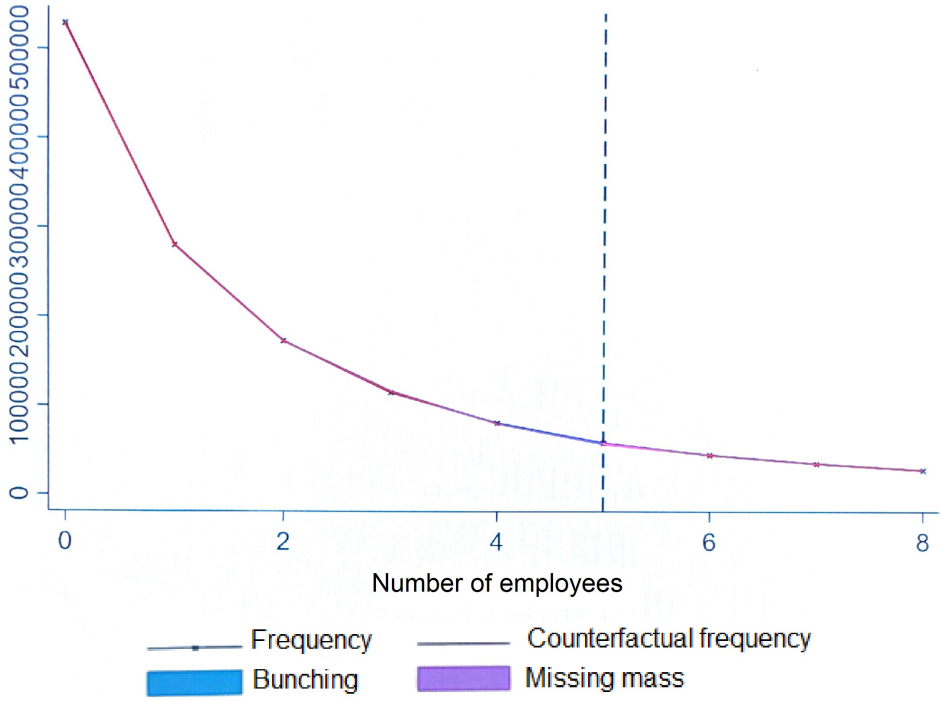


Figure A6: Bunching at the 250 employee threshold for SME incentives

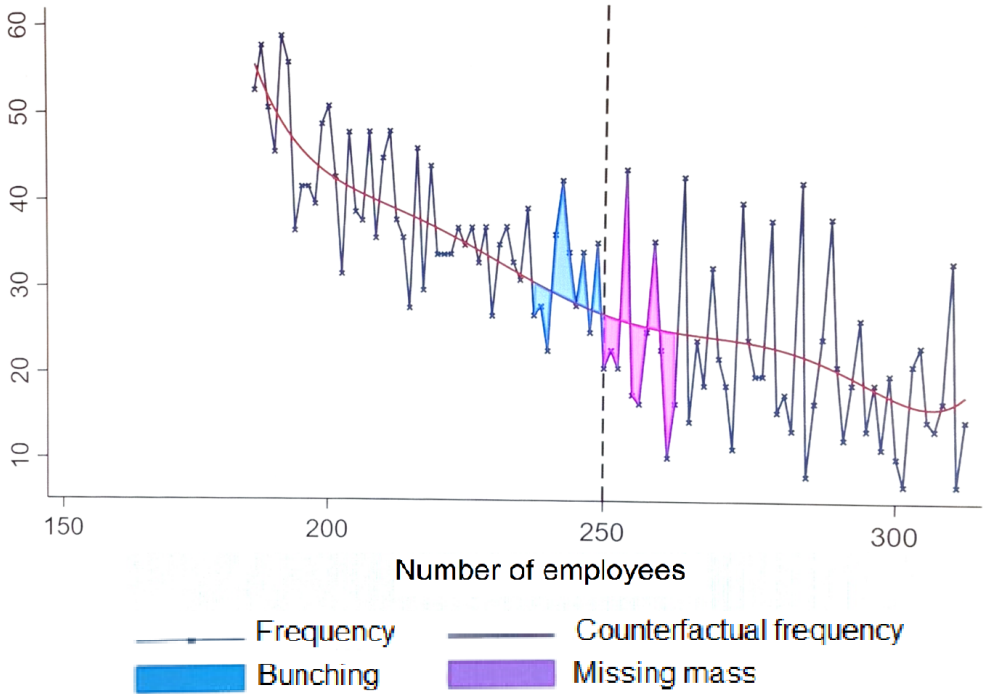


Figure A7: Bunching at the 50 employee threshold for the biennial workforce report, 7% disabled workers, and ordinary financial statements