How do Firms Behave in Simplified Tax Regimes? *

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Abstract

Simplified tax regimes (STRs) lower tax and compliance costs for small firms, but preferential rules can also generate avoidance and distort both firm behavior and selection. Using novel linked microdata, we study Brazil's 2018 Factor R reform, which granted a large revenue-tax cut to firms whose payroll reached 28% of revenue. We develop a conceptual framework to show that this unprecedented policy experiment increased the value of the STR for labor-intensive firms and those that could adjust their Factor R at a low cost. For incumbent firms, the reform generated two distinct quasi-experiments. Firms already above 28% automatically received the tax cut, while firms initially below 28% could obtain it only by increasing employee payroll, reducing reported revenue, or shifting owner income from dividends to wages. The first group increased reported revenue by 10% but had no employment responses. Firms below the threshold responded almost entirely through income shifting, showing how a cheaper adjustment margin can displace the intended policy goal. On the extensive margin, firm entry increases by about 50%. Marginal entrants are selected on income-shifting rather than labor intensity. We find that 35% of marginal new firms would otherwise have entered another tax regime, reducing tax payments. Thus, avoidance opportunities can weaken targeted STR incentives twice: by redirecting incumbent responses away from the intended margin and by selecting firms especially able to exploit those same opportunities.

JEL Codes: D3, H2, H3, H5

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1 Introduction

Small and medium-sized firms (SMEs) play a central role in economic activity worldwide. Yet, how to tax SMEs remains a central question in public finance. Many countries have adopted simplified tax regimes (STRs), mostly based on a single revenue tax, and they are particularly prevalent in developing countries, where STRs cover a wide range of firms. Despite their popularity, the desirability of such regimes is ambiguous.

On the one hand, STRs can foster registration and growth by reducing hassle costs and the overall tax burden. On the other hand, low reporting standards and weak monitoring may facilitate evasion and avoidance strategies, undermining revenue collection and the fairness of tax systems. Additionally, because revenue taxes do not allow cost deductibility, STRs disproportionately affect labor-intensive firms, possibly leading to real output distortions. Empirically identifying and measuring all these margins is challenging, as it requires policy variation that induces meaningful responses along each of them while allowing them to be separately identified.

We advance the literature by combining new tax micro-data for Brazil to study the "Factor R" policy, a sharp reform that made *Simples Nacional* (Brazil's STR) more generous for two groups of firms: labor-intensive firms and those that can perform income-shifting at a low cost. Starting in January 2018, the policy states that eligible firms with a *payroll-to-revenue* ratio (Factor R) of 28% or higher face a large drop in their revenue tax rate, averaging 9 pp, introducing a massive tax notch in the system. Importantly, the payroll considered in the Factor R included both employees' payroll and owner wages, and the reform affected both incumbent and new firms.

The Factor R reform is an unprecedented tax policy that offers a unique lens through which to study firms' behavioral responses to STR incentives. First, for incumbent firms, it generated two clean quasi-experiments: On the one hand, firms with pre-policy Factor R greater than 28% automatically become eligible for the revenue tax cut, thereby providing exogenous variation in the tax rate they face. On the other hand, firms with a pre-policy Factor R below 28% must increase their payroll-to-revenue ratio to receive the tax cut, allowing us to study the cheapest way firms have to reach the threshold. Second, for new firms, the policy made the STR more attractive for labor-intensive firms as well as those that can take advantage of the income-shifting loophole, allowing us to measure which group responds the most and their corresponding counterfactual.

A common challenge in studying firms in STRs is the limited microdata available because they are typically subject to few tax forms and reporting requirements. Our analysis relies on novel tax microdata on the universe of SME firms, social security records, electronic payment systems (including invoices), bank account flows, credit card information,

ownership records, and individual income tax forms.[1] This allows us to create a unique data environment with comprehensive information for the universe of firms and owners in the entire country.

We begin by showing descriptively that the large tax notch induced by the Factor R policy led to strong behavioral responses. Since the policy's implementation, we document a large bunching at 28% and excess mass just above it, and an almost fully dominated region below it. Interestingly, the cross-sectional pattern grows over time, consistent with both incumbents' learning and compositional change among new entrants, which we investigate further.

Before turning to the empirical analysis, we develop a conceptual framework that provides a common interpretation of the reform's intensive- and extensive-margin effects. The key object is the increase in the value of operating under *Simples Nacional* generated by Factor R. We decompose this value into the benefit of receiving the lower revenue-tax schedule and the optimized cost of satisfying the payroll-to-revenue eligibility requirement. This distinction highlights two ways in which firms can benefit from the reform: some naturally satisfy the rule because their production technology generates a high payroll share, while others can profitably manufacture eligibility by adjusting the Factor R components. For incumbent firms, the framework predicts how these incentives map into movements around the 28% threshold and into the margins used to reach it. For potential entrants, it governs selection into the regime, while productivity sorting helps characterize whether marginal entrants would otherwise remain unregistered or switch tax regimes.

We first turn to incumbent firms' behavioral responses, for which the reform generates two distinct quasi-experiments depending on the pre-policy location in the Factor R distribution. Firms initially below the 28% threshold can obtain the tax cut by increasing employee payroll, reducing reported revenues, shifting owner income from dividends to wages, or combining these margins. For firms with a pre-policy Factor R above the threshold, we show that the reform simply reduced the revenue tax rate, provided firms did not become constrained by the threshold, thereby helping us measure the revenue and input-distortion effects of revenue taxation.

Through a series of *difference-in-differences* analyses, we show that Low-FR firms respond almost entirely through income shifting. On average, firms gradually increase owner wages, reaching 25% two years after the reform, while keeping revenues and employees' payroll and revenues constant. High-FR firms, in contrast, increase reported revenues by about 10% two years after the reform, with no detectable response in employees' payroll. Owner wages also increase, but by substantially less than for Low-FR firms; this

[1] Accessing this data has been possible thanks to the researcher collaboration between the International Tax Observatory (ITO) and *Receita Federal de Brasil* (RFB).

response is concentrated among firms initially close to the threshold, consistent with the eligibility constraint becoming relevant as they re-optimize. As a result, incumbent firms' reoptimization contributes to the bunching pattern. Our decomposition analysis shows that 84% of incumbent bunchers would otherwise have been located below the threshold, while the remaining 16% would have been located above it.

We then study the extensive margin responses, as the same policy-induced increase in the value of *Simples Nacional* that governs incumbent incentives also changes firms' regime choices. In this case, we also rely on *difference-in-differences*, but we follow exposed vs. non-exposed industries, rather than firms. Additionally, We decompose the ITT estimates into the policy's effect on inframarginal entrants (always-takers) from changes in the composition of marginal entrants (compliers). This allows us to ask whether the firms induced into Simples are selected primarily on the labor-intensity margin targeted by the policy or on their ability to exploit the owner-income-shifting opportunity.

We find an increase in the number of new firms of about 50% in exposed industries relative to non-exposed industries. Consistent with the incentives generated by the policy, the share of new entrants with a Factor R above 28% doubles. We find that the new firms induced by the policy are three times as likely to be above 28% as the pre-reform new entrants. Decomposing Factor R reveals the source of this selection: marginal entrants differ sharply in owner wages relative to revenues, while their employees' payroll-to-revenue ratio is essentially unchanged. Thus, we find no evidence that the extensive-margin response is driven by selection of more hired-labor-intensive firms. Instead, the marginal entrants are disproportionately firms using owner compensation to satisfy Factor R, consistent with selection on the income-shifting opportunity created by the reform.

Looking at new firms' counterfactual, we find no evidence of industry, or labor contract relabeling.[2] However, we find a large reduction in the number of new firms in the exposed industries in *Lucro Presumido*, the main alternative tax regime. This reduction accounts for 35% of the flow of new firms in Simples Nacional, and a similar pattern is observed in the evolution of the stocks. Therefore, we conclude that the remaining share corresponds to true new business registration, but we are unable to determine whether it is due to formalization or business creation.

Finally, we summarize and compare the order of magnitude of each behavioral response by examining their impact on government revenues. We find that the extensive-margin responses are large, accounting for half of the mechanical effect. However, as those whose counterfactual would be the alternative tax regime contribute negatively to tax collection, the net effect is much smaller. For the incumbent firms, we show that the

[2]In Brazil, a common evasion practice for employees is to arrange with their employers a B2B contract rather than an employment contract to save social security contributions and personal income taxes. This is a practice known as *pejotizacao*.

income-shifting response dominate the scene, as it is orders of magnitudes larger than the revenue collection for the increase in reported revenue of High FR firms.

Our results reveal a central challenge in the design of simplified tax regimes. When preferential treatment is conditioned on firm behavior, firms need not respond through the margin policymakers intend: they use the least costly way of satisfying the rule. This matters not only for incumbent behavior but also for selection, because the regime disproportionately attracts firms for which that response is cheapest. Consequently, the desirability of an STR cannot be inferred from take-up alone; it depends on the behaviors used to obtain preferential treatment and on whether marginal entrants represent new participation or substitution from other tax regimes.

Relation to the literature

Our paper relates first to the public-finance literature on business taxation under imperfect enforcement. A central insight of this literature is that the desirability of a tax base depends not only on the distortions it creates to real activity, but also on how easily taxpayers can manipulate it. Best et al., 2015 provide an important benchmark: when profits are difficult to verify, turnover taxation can increase revenue efficiency by restricting opportunities to evade, despite creating greater production distortions than a profit tax. Related work documents that firms respond to taxation and enforcement through multiple reporting margins, including sales and cost misreporting, movements into informality, and changes in organizational form (Carrillo, Pomeranz, and Singhal, 2017; Waseem, 2018; Bachas and Soto, 2021; Lobel, Scot, and Zúniga, 2024). Our paper studies a distinct policy problem. Simplified tax regimes do not simply replace a difficult-to-enforce profit base with an easier-to-monitor turnover base for a fixed population of firms. They offer preferential tax treatment and lower compliance requirements to a selected set of SMEs, thereby affecting both firms' behavior conditional on participation and their incentives to enter the regime in the first place. The relevant policy tradeoff therefore extends beyond the production-versus-revenue-efficiency margin emphasized by Best et al., 2015: the benefits of attracting additional firms into a simplified regime must be evaluated together with the avoidance, evasion, and real distortions generated by the regime's preferential treatment.

This extensive-margin rationale connects our paper to a large development literature studying policies intended to bring small firms into the formal economy. Early evidence showed that reducing one-time registration costs, providing information, or simplifying registration often produces only modest increases in formalization, suggesting that for many informal firms the private benefits of formality are insufficient to compensate for its recurring costs (De Mel, McKenzie, and Woodruff, 2013; Bruhn and McKenzie, 2014; De Andrade, Bruhn, and McKenzie, 2016; Ulyssea, 2020). Other interventions that increase

the benefits of registration or substantially reduce ongoing tax and compliance costs can generate larger effects (Benhassine et al., 2018; Farias and Hsu Rocha, 2026). Importantly, however, additional registration does not mechanically imply firm growth, higher productivity, or greater tax revenue. We contribute to this literature by moving beyond the number of firms induced to register. We characterize the marginal firms attracted by the simplified regime and study their counterfactual choices. Some induced firms come from the outside option and therefore represent additional business registration, whereas others would have operated under the alternative tax regime and primarily represent a reallocation of activity across tax regimes. We further show that marginal participation can be driven not by the production characteristics targeted by the policy but by firms' ability to exploit tax-planning opportunities embedded in the regime.

Our findings also relate closely to the literature on income shifting by business owners. When labor and capital income or corporate and personal income face different tax treatments, owner-managers can respond to taxes by changing the form in which a given amount of economic income is reported rather than by changing real economic activity (Gordon and Slemrod, 1998). This margin has been particularly well documented in Nordic dual-income-tax systems. Fjaerli, Lund, et al., 1997 study owners' choice between wages and dividends in Norway; Pirttilä and Selin, 2011 document shifts between labor and capital income following the introduction of Finland's dual income tax; Le Maire and Schjerning, 2013 show that income shifting explains a substantial portion of taxable-income bunching among Danish self-employed individuals; Alstadsæter and Jacob, 2016 document large shifting responses to dividend taxation among Swedish owner-managers; and Harju and Matikka, 2014 separately identify real and income-shifting responses among Finnish business owners. Relatedly, Tazhitdinova, 2020 shows that tax differences across organizational forms affect both income shifting and business entry. Our setting introduces a different interaction between business and personal tax bases. Under Factor R, reporting owner income as wages rather than dividends not only reallocates income across personal tax bases: because owner wages enter the payroll-to-revenue eligibility criterion, the shifting decision can move the entire firm to a substantially lower business-tax schedule. We exploit this feature to compare income shifting directly with alternative ways of satisfying the rule, including increasing employee payroll and reducing reported revenues. We find that incumbent firms overwhelmingly adjust through owner compensation rather than the intended employment margin. Moreover, the same ability to shift owner income affects selection into the simplified regime: marginal entrants are distinguished from inframarginal firms by owner wages rather than by employee payroll. Income shifting therefore matters not only for behavior within the regime, as in much of the existing literature, but also for the composition of firms attracted by preferential

business taxation.

Finally, our paper contributes directly to a growing literature on the design of simplified and dual-regime tax systems. Bruhn and Loeprick, 2016 provide early evidence that preferential small-business regimes can simultaneously increase formal firm creation and reduce tax compliance, illustrating that gross formalization gains need not translate one-for-one into gains in reported activity. Wei and Wen, 2024 formalize a related trade-off: a preferential turnover-tax regime can induce informal firms to enter the tax system while encouraging firms near its upper eligibility threshold to strategically reduce reported sales. Hoy et al., 2024 document further trade-offs in simplified-regime design using administrative and survey evidence from Kenya, while Sharma et al., 2025 study the optimal design of systems that combine turnover and profit taxation. Closest to our paper, Gravoueille and Stantcheva, 2025 study the choice of simplified tax regimes by self-employed individuals in France and quantify the extent to which taxpayers' attraction to these regimes reflects a preference for simplicity versus opportunities for tax evasion. We address a complementary question: rather than decomposing the value taxpayers attach to simplicity, we study how the design of a preferential simplified regime affects both the behavior of participating firms and the composition of firms selected into it. Factor R makes eligibility depend on an endogenous production-and-reporting ratio, allowing us to distinguish firms that benefit because they are naturally labor intensive from firms that can manufacture eligibility through tax planning. Combining this variation with linked firm, owner, payroll, and third-party data, we identify the margins through which incumbent firms obtain preferential treatment, characterize the firms induced to enter the regime, and recover whether those marginal entrants would otherwise have remained outside the formal tax regime or operated under an alternative tax system. The results show that evaluating simplified tax regimes requires accounting jointly for the firms they attract and for the behavioral margins through which those firms respond to the tax preference.

2 Context and Data

Brazil is one of the largest middle-income countries with more than 220 million inhabitants. The production landscape is dominated by small and medium-sized firms, which accounted for more than 80% of the approximately 7 million active firms in 2022. SMEs are also important for employment as they comprise 31% of formal employees and 26% of total payroll. However, they represent a much smaller share of the government's revenue from business taxation (8%).

Table 1: Totals by Tax Regime (2022)

	Firms	Tax Payments (in millions R$)	Employees	Payroll (in millions R$)
Lucro Real	220,384	1,354,174	34,126,577	1,584,977
Lucro Presumido	1,073,033	201,994	7,745,465	290,290
Simples Nacional	5,560,139	150,618	19,000,890	660,637
MEI	9,429,910	253,050	5,185	2,483
Totals	16,283,466	1,711,972	61,134,749	2,538,389
Totals – MEI	6,853,556	1,706,787	60,872,933	2,535,905
Share Simples (excl. MEI)	81.13%	8.08%	31.21%	26.05%

Table 1 provides descriptive statistics for firms in each tax regime. The largest firms are in *Lucro Real*, a standard profit tax regime mandated for firms with annual revenues above R$78 million. The marginal tax rate on profits ranges from 15 to 35%. The second tax regime is *Lucro Presumido*, which also covers large firms as those with annual revenues above R$4.8 million must opt in either for *Lucro Presumido* or *Lucro Real*. The critical difference is that firms in this regime pay taxes on the presumptive profits. Common to both tax regimes is the requirement that firms submit several forms to the tax authority, including not only complete digital accounting records and fiscal bookkeeping but also state and municipal tax forms. SMEs fall under *Simples Nacional*, with a R$4.8 million threshold. This is a simplified tax regime, under which taxpayers submit a single, straightforward tax form to the tax authority to report basic information. SMEs are taxed on revenue, with the rate depending on revenue level and sector. Finally, low-income self-employed can opt-in for *Microemprendedor Individual* (MEI), as long as their annual revenues do not exceed R$81,000. This is also a simplified tax regime with a flat payment, and it is not legally allowed to have more than one employee. It was designed to increase registration of informal employees (Farias and Hsu Rocha, 2026).

This paper focuses on *Simples Nacional*, the cornerstone of SME policy. It was established in federal law in 2016, and it covers a heterogeneous range of firms, from high-income individuals providing consulting services to medium-sized labor-intensive manufacturing firms. Moreover, owners of firms in *Simples Nacional* rank between the 95th and 99.5th percentiles of the income distribution in the country (Palomo et al., 2025).

Within *Simples Nacional*, firms are currently assigned to one the five sector-specific "Anexos" (schedules) with progressive marginal rates by gross-revenue brackets. The underlying principle of the Anexos is that different sectors have different profit margins, thereby making explicit the presumptive component of this simplified tax regime. Because the service sector is highly heterogeneous, Anexos III, IV, and V differentiates among activities within the service sector. Moreover, to further approximate true profit margins, some of these service-related activities are subject to the *Factor R* rule. This rule states that

the corresponding Anexo (and therefore the tax schedule) depends on the firm's payroll-to-revenue ratio. Firms with large Factor R are assigned to Anexos with lower revenue tax rates, and vice versa. The Online Appendix presents all tax schedules corresponding to *Simples Nacional*.

The Factor R Reform

On 1 January 2018, the Brazilian government introduced a reform on how the Factor R policy works. Before, a very restricted set of activities were subject to the Factor R rule, and the system was extremely complex. For instance, there were eight payroll-to-revenue ratio thresholds that implied very small discontinuities in the average and marginal revenue tax rates, and these discontinuities varied across the more than 20 revenue brackets. Following 2018, the government adopted a clear Factor R rule. Firms with a payroll-to-revenue ratio above 28% would be assigned to the tax schedule in Anexo III, while those below would go to Anexo V.

Three elements are critical to understand how the reform changed firms' incentives. First, there is a large group of service-related activities that were not subject to any Factor R rule and the reform included them. These were firms listed in the previously existing Anexo VI, including activities such as engineering services, consulting, and journalism, among others (see Table A.1 for details). Second, the distinction between Anexo III and Anexo V entails a substantial drop in the average tax rate, creating a tax notch and strong incentives to cross the 28% threshold.[3] Finally, Table A.5 firms previously in Anexo VI were facing revenue tax rates closer to the ones in the new Anexo V. This means that firms that had a pre-policy payroll-to-revenue ratio above 28% faced a plain revenue tax cut.

The last component of the reform worth mentioning is what it did not modify, since that provides a control group for a clean identification strategy. Activities in Anexo IV were not subject to Factor R, and they remained unaffected. These activities include construction, logistics, landscaping, interior design, security, cleaning, and legal services.

Finally, as the Factor R could be increased through owner wages, it is worth mentioning the interaction with other tax payments. In Brazil, when the owner pays himself in wages (*prolabore*), she must pay two wage taxes. The first is the contribution to the social security system (INSS) of about 11%. This payment is linked to social security benefits, such as retirement pension and life insurance for the family. The relative value of benefits over contributions explains why a significant share of firm owners pay themselves wages, even in the pre-policy period, when the dividend tax is zero. Figure A.1 shows that

[3]Reporting additional payroll entails social security contributions and, potentially, labor income taxes if the owner pays himself wages. Taking this into account, we show that the effective tax rate still drops substantially above the threshold.

the tax notch is still substantial even after accounting for contributions.[4] Second, owner wages are taxable income (different from dividends), and subject to the individual income tax.[5] However, the exemption threshold for the individual income tax is very large. Therefore, the level of owner wages that must be reported in order to offset the gains from the revenue tax cut is not binding for 95% of firms in Simples Nacional.

2.1 Data

This paper uses detailed Brazilian tax data that were previously unavailable for research purposes. This is possible thanks to a collaboration between researchers at the International Tax Observatory (ITO) and *Receita Federal de Brasil* (RFB). Given the stringent confidentiality policies, all data processing has been conducted on RFB's premises by a tax auditor. We work with the following databases:

PGDAS:
It is the monthly tax declaration and payment platform for firms in the simplified business tax regime, filed with the federal tax authority and used to compute the firm's tax due under that regime. It covers essentially all opted-in CNPJs and their self-reported monthly tax declarations used to compute liabilities under the regime. Each record is tied to a firm identifier (CNPJ) and a reference month, and reports the tax base and payments that determine the Simples "DAS" due—most importantly gross revenues by month and the information needed to place the firm in the relevant schedule (Anexo) and bracket (with the rolling 12-month revenue concept used in the rate formula). The data include regime classifications and related inputs (e.g., activity/schedule and, when relevant, payroll and the payroll-to-revenue criterion that governs eligibility for Factor R schedules). Reporting is monthly and near-real-time, making it well-suited for studying behavioral responses at policy thresholds and around implementation dates.

GFIP:
It is best thought of as a monthly employer payroll report—not a standard business tax return. Firms submit it to the social security / payroll contribution administration to report employee links and earnings, which are used to assess and collect payroll-based contributions (and, in practice, it also serves as the reporting channel for a mandatory severance savings fund). Each record is linked to an employer identifier (CNPJ/CEI) and a reference month, and contains employment and earnings information used to calculate and

[4]Note that it becomes a lower bound of the true changes in incentives as it does not count the valuation of the benefits that comes with the contribution payments.
[5]IRPF (*Imposto de Renda sobre Pessoa Física)*

remit payroll-based obligations—typically including the number of workers, total wage bill (by contribution base), and the contribution amounts due/paid to social security and associated programs. Reporting is monthly and tied to compliance: firms must submit GFIP to regularize their payroll contributions, and the data therefore allow us to observe both real-side labor outcomes (formal employment and payroll levels) and filing behavior (whether/when firms report).

e-Social:
It is a unified, electronic reporting system for employers that collects high-frequency information on formal labor relationships—hires and separations, monthly earnings, hours, and other payroll-relevant events—together with the information needed to assess payroll-based contributions and labor obligations. Conceptually, it is the "digital backbone" of employer compliance: instead of filling multiple separate payroll forms, firms transmit standardized event-level and monthly payroll records through a single platform, which are then shared across the relevant government administrations (tax collection, social security, and labor authorities). In practice, eSocial replaced the older payroll filing (GFIP) for many taxpayers and functions, shifting payroll compliance from a standalone monthly form toward an integrated, electronic reporting pipeline that supports both calculation and enforcement.

DECRED:
It is a third-party information return on card payments, filed by card networks/acquirers (the payment processors), not by firms, and submitted to the federal tax authority. It reports, for each merchant (identified by tax ID), the aggregate amounts processed via payment cards by month, allowing the tax authority to cross-check firms' self-reported sales against independently reported electronic payments.

3 Descriptive Evidence: Bunching

We begin by presenting a descriptive analysis showing that the Factor R policy strongly affected the distribution of the payroll-to-revenue ratio. For firms subject to the Factor R rule, Figure 1a shows the empirical average revenue tax rate. As expected, when firms cross the 28% threshold, they face a significantly lower rate, as they are moved to Anexo III.[6]

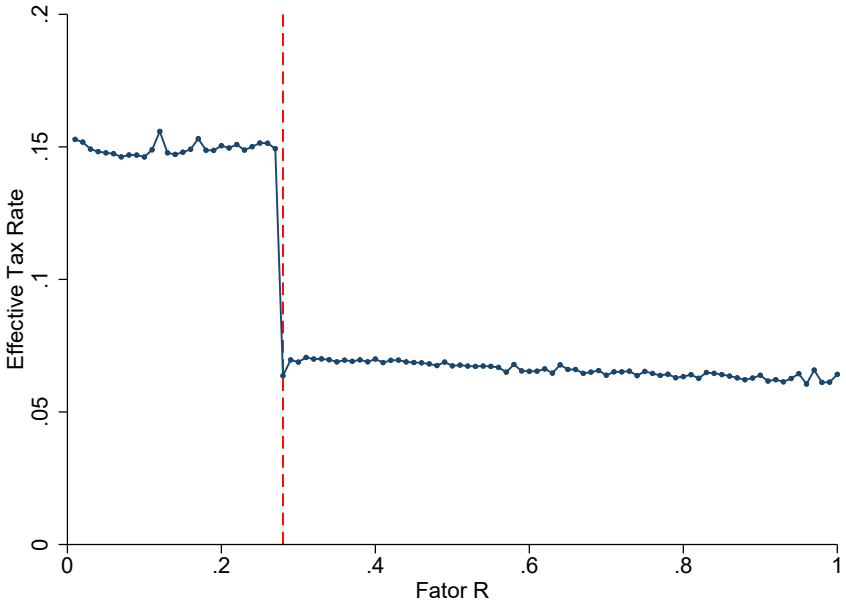
Consistent with a large tax notch, Figure 1b documents a large bunching response with

[6]The implementation of the policy was straightforward, as the system would report firms' tax due during the tax form completion. Indeed, firms could play with reported numbers and see different tax bills, making the manipulation of the system relatively easy.

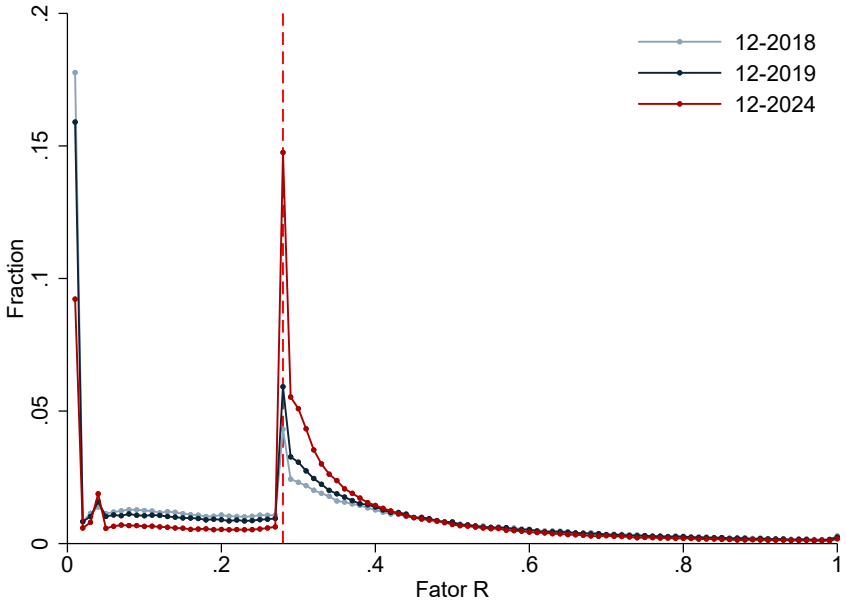
about 15% of all firms subject to Factor R reporting a payroll-to-revenue ratio exactly at 28%. While tax notch theory predicts this behavior (Kleven, 2016), most empirical analyses fail to find such a clean pattern and attribute the difference to adjustment frictions (Bachas and Soto, 2021; Lobel, Scot, and Zúniga, 2024). We interpret our findings in a high-stakes context where adjustment costs are low.

Two additional patterns are worth highlighting. First, there is a hole in the distribution right below the threshold, consistent with a dominated region induced by the tax notch, suggesting that most of the bunching comes from below 28%. Second, there is an interesting dynamics in the bunching pattern that persistently grows year after year. Differentiating whether this is caused by incumbent firms learning over time or by new entrants is critical to understand firms' counterfactual and, therefore, the policy effect.

Figure 1: Factor R distribution in December 2024



(a) Average revenue tax rate



(b) Factor R distribution

Notes: This figure shows both the discontinuity in revenue tax rates and the fraction of firms across the Factor R distribution. Panel (a) plots the mean of the average revenue tax rate paid by firms in each Factor R bin. Panel (b) shows the fraction of all firms subject to the Factor R rule at each possible Factor R value. The red line indicates the 28% threshold. Bins are of .01 size.

4 Conceptual Framework

The Factor R reform provides unusually rich variation in firms' incentives. For incumbent firms, access to the lower revenue-tax schedule depends on an endogenous payroll-to-revenue ratio that can be adjusted through production, employment, revenue reporting, or owner compensation. For potential new firms, the same tax preference changes the value of selecting into Simples Nacional relative to alternative regimes. Interpreting the empirical responses therefore requires a framework that connects these two margins and clarifies which economic forces can generate the patterns observed in the data.

We develop a common framework centered on the value that Factor R adds to operating under Simples. The framework serves three purposes. First, it separates the benefit of the lower revenue-tax schedule from the cost of satisfying the eligibility requirement, allowing us to characterize when firms find it profitable to obtain the tax preference. Second, it shows how heterogeneity in technology and scale determines which firms benefit most: some firms naturally satisfy Factor R because of their labor intensity, while others may find it cheap to manufacture eligibility by changing reporting or compensation choices. Third, the same value change disciplines both sides of our empirical analysis. For incumbents, it determines whether firms cross or bunch at the threshold and which margins they use to do so. For potential entrants, it determines which firms are induced to select into Simples and helps characterize the tax-regime counterfactual of those marginal firms.

4.1 The operating problem and the value of Factor R

Consider a firm characterized by two technological parameters, (A_i, δ_i). A_i is a Hicks-neutral productivity shifter governing potential scale, while δ_i shifts production toward hired labor relative to other productive inputs.

The owner chooses a composite input e_i, hired labor L_i, reported revenue $\widetilde{R}_i$, and owner income reported as wages (*pro-labore*), w_i^o. The input e_i should be interpreted as a composite of productive inputs other than hired labor that are not separately modeled, as we do not directly observe them. An especially important component in our setting is the owner's effort: many small firms have few or no employees, so production may rely directly on the owner's time and effort.

True revenue is generated according to

$$R_i = R(e_i, L_i; A_i, \delta_i). \tag{1}$$

The parameter δ_i is a labor-biased technology shifter: holding other primitives fixed, a

higher δ_i increases the productivity of hired labor relative to the composite input e_i.

Employee payroll is wL_i, where w denotes the unit cost of Factor-R-eligible employee payroll. Total payroll entering Factor R is

$$P_i = wL_i + w_i^o, \tag{2}$$

and the firm's Factor R is

$$r_i \equiv \frac{P_i}{\widetilde{R}_i} = \frac{wL_i + w_i^o}{\widetilde{R}_i}. \tag{3}$$

Let H denote the high-tax schedule, corresponding to Anexo V, and L the favorable low-tax schedule, corresponding to Anexo III. Let $\mathcal{T}_H(\widetilde{R})$ and $\mathcal{T}_L(\widetilde{R})$ denote total revenue-tax liabilities under the two schedules. Over the relevant range of revenues,

$$\mathcal{T}_L(\widetilde{R}) < \mathcal{T}_H(\widetilde{R}) \qquad \text{for } \widetilde{R} > 0. \tag{4}$$

Conditional on schedule $j \in \{H, L\}$, the owner's payoff is

$$u_j(x_i; A_i, \delta_i) = R_i - \mathcal{T}_j(\widetilde{R}_i) - wL_i - v(e_i) - \Phi(L_i) - c(R_i - \widetilde{R}_i) - \Gamma(w_i^o), \tag{5}$$

where

$$x_i = (e_i, L_i, \widetilde{R}_i, w_i^o).$$

The function $v(\cdot)$ captures the resource or private cost of the composite input e_i. When e_i represents owner effort, this includes the opportunity or disutility cost of the owner's time. $\Phi(\cdot)$ captures other costs associated with hired labor and may include a fixed hiring cost. The function $c(\cdot)$ is the cost of underreporting revenue, and $\Gamma(\cdot)$ is the net private cost of reporting owner income as wages rather than dividends. The latter includes payroll contributions and personal income taxation net of the value of associated social-security benefits. We allow these functions to be nonlinear, so the relative cost of adjusting the different components of Factor R need not be constant.

Before the reform, affected firms faced the high schedule H. After the reform, they continue to face H if $r_i < T$, but receive the favorable schedule L if

$$r_i \geq T, \qquad T = 0.28. \tag{6}$$

Thus, the reform does not simply lower the revenue tax. It makes access to the lower schedule conditional on an endogenous statistic that firms can alter through hired labor, owner compensation, reported revenue, or changes in production.

4.1.1 Operating values

Define the firm's maximized payoff under the high schedule as

$$\Pi_H(A_i, \delta_i) \equiv \max_{x_i} u_H(x_i; A_i, \delta_i), \tag{7}$$

and its unconstrained maximized payoff under the low schedule as

$$\Pi_L(A_i, \delta_i) \equiv \max_{x_i} u_L(x_i; A_i, \delta_i). \tag{8}$$

The latter is a hypothetical object in which the firm receives the favorable schedule regardless of its Factor R. It isolates how the firm would re-optimize in response to the lower revenue tax in the absence of an eligibility requirement.

Let x_i^L denote an allocation attaining (8)[7], and define

$$r_i^N \equiv r(x_i^L). \tag{9}$$

We refer to r_i^N as the firm's *natural Factor R under the favorable schedule*: it is the payroll-to-revenue ratio the firm would choose after fully re-optimizing to the low-tax schedule if eligibility did not depend on Factor R.

Finally, define the value of the best allocation that actually satisfies the eligibility condition:

$$\Pi_T(A_i, \delta_i) \equiv \max_{x_i : r(x_i) \geq T} u_L(x_i; A_i, \delta_i). \tag{10}$$

It is useful to decompose the value generated by Factor R into two objects. First, define the unconstrained benefit of receiving the favorable tax schedule:

$$B(A_i, \delta_i) \equiv \Pi_L(A_i, \delta_i) - \Pi_H(A_i, \delta_i). \tag{11}$$

For an operating firm with positive reported revenue, $B(A_i, \delta_i) > 0$.

Second, define the optimized cost of satisfying the Factor R eligibility restriction:

$$C(A_i, \delta_i) \equiv \Pi_L(A_i, \delta_i) - \Pi_T(A_i, \delta_i) \geq 0. \tag{12}$$

The object C is an opportunity cost, measured in optimized firm payoff. It compares the allocation the firm would ideally choose under the favorable tax schedule with the best allocation available under that same schedule once the Factor R restriction is imposed.

[7] If the unconstrained low-tax problem admits multiple optimal allocations, we assume that they generate the same employee-payroll share and owner-wage share, and hence the same Factor R. This allows the allocation itself to be non-unique while making p^N, ω^N, and r^N uniquely defined

Because the two problems differ only by the eligibility restriction, C isolates the loss generated by that restriction. Importantly, it is not the cost of any particular manipulation: the firm can re-optimize jointly over hired labor, the composite input e_i, owner compensation, and revenue reporting.

The actual increase in the firm's operating value generated by Factor R is therefore

$$\begin{aligned} G(A_i, \delta_i) &\equiv \max\{\Pi_H(A_i, \delta_i), \Pi_T(A_i, \delta_i)\} - \Pi_H(A_i, \delta_i) \\ &= [B(A_i, \delta_i) - C(A_i, \delta_i)]_+ . \end{aligned} \tag{13}$$

Equation (13) is the central object of the framework. The reform increases the value of Simples for a firm when the benefit of receiving the favorable tax schedule exceeds the minimum loss required to satisfy the eligibility rule.

If the firm's unconstrained low-tax allocation already satisfies Factor R, then imposing the restriction does not alter its preferred allocation:

$$r_i^N \geq T \quad \Longrightarrow \quad \Pi_T(A_i, \delta_i) = \Pi_L(A_i, \delta_i),$$

and hence

$$C(A_i, \delta_i) = 0, \qquad G(A_i, \delta_i) = B(A_i, \delta_i). \tag{14}$$

If instead

$$r_i^N < T,$$

the eligibility restriction excludes the firm's preferred low-tax allocation, so $C(A_i, \delta_i) > 0$. The firm benefits from Factor R only if the tax benefit is sufficiently large to compensate for this distortion:

$$B(A_i, \delta_i) > C(A_i, \delta_i).$$

4.2 Which firms gain most from Factor R?

Equation 13 shows that heterogeneity in the value of Factor R can arise through two conceptually distinct mechanisms. Some firms naturally generate a sufficiently high payroll-to-revenue ratio and therefore receive the full benefit of the lower tax schedule. Other firms would naturally locate below the threshold but can profitably modify their behavior to satisfy it. We refer to these mechanisms as *natural eligibility* and *manufactured eligibility*, respectively.

4.2.1 Natural eligibility and labor-biased technology

We first characterize the mechanism through which a labor-biased technology makes Factor R more valuable. Recall that δ_i raises the productivity of hired labor relative to the composite alternative input e_i. Let

$$p^N(A,\delta) \equiv \frac{wL^L(A,\delta)}{\widetilde{R}^L(A,\delta)} \tag{15}$$

denote the employee-payroll-to-revenue ratio at the unconstrained low-tax allocation. We refer to $p^N(A,\delta)$ as the firm's *natural employee-payroll intensity*. Similarly, define the natural owner-wage share as

$$\omega^N(A,\delta) \equiv \frac{w^{o,L}(A,\delta)}{\widetilde{R}^L(A,\delta)}. \tag{16}$$

The firm's natural Factor R is therefore

$$r^N(A,\delta) = p^N(A,\delta) + \omega^N(A,\delta). \tag{17}$$

The comparative statics required for δ to order firms by natural eligibility are stated explicitly below.

Assumption 1 (Labor-bias and natural-eligibility ordering)**.** *For every A and any $\delta_2 > \delta_1$:*

1. *Employee-payroll intensity is weakly increasing in the labor-bias parameter,*

$$p^N(A,\delta_2) \geq p^N(A,\delta_1). \tag{18}$$

   If hired labor is positive at both unconstrained low-tax allocations, the inequality is strict.

2. *Changes in the natural owner-wage share do not offset the increase in employee-payroll intensity:*

$$\omega^N(A,\delta_2) - \omega^N(A,\delta_1) \geq -\left[p^N(A,\delta_2) - p^N(A,\delta_1)\right]. \tag{19}$$

The first condition gives δ its economic interpretation as a labor-bias parameter. The weak global monotonicity accommodates firms that optimally employ no hired labor over a range of δ, in which case $p^N(A,\delta) = 0$ until hiring becomes optimal. Once the firm uses hired labor, a higher δ must increase employee payroll relative to reported revenue.

This property is not automatic for an arbitrary production technology. A higher δ makes hired labor more productive, but it can also change the use of the alternative input e and expand revenue. If hired labor and e are sufficiently complementary, these equilibrium adjustments may be large enough that less expenditure on hired labor is required per unit of revenue, causing p^N to fall. The first part of Assumption 1 rules out this case:

substitution toward hired labor must be sufficiently strong that the induced adjustment in the alternative input and revenue does not overturn the increase in labor intensity.[8]

The second condition is needed because Factor R depends on total payroll, not employee payroll alone. A higher δ may change the owner wage that the firm would optimally report even in the absence of the eligibility restriction. Equation (19) requires only that any decline in this natural owner-wage share not be large enough to undo the increase in employee-payroll intensity. Combining both parts of Assumption 1 gives

$$r^N(A, \delta_2) \geq r^N(A, \delta_1). \tag{20}$$

A firm is *naturally eligible* whenever its unconstrained low-tax allocation already satisfies

$$r^N(A, \delta) \geq T. \tag{21}$$

Natural eligibility therefore requires that the optimum Factor R from the unconstrained re-optimization reaches the threshold. What matters is that neither employee payroll nor owner compensation is being changed *because of* the eligibility restriction. For a naturally eligible firm, imposing the Factor R constraint leaves its preferred low-tax allocation feasible. Hence,

$$C(A, \delta) = 0, \qquad G(A, \delta) = B(A, \delta). \tag{22}$$

The stronger condition $p^N(A, \delta) \geq T$ remains a useful sufficient case: such a firm qualifies through employee payroll alone, independently of its owner-compensation choice. It is not, however, required for natural eligibility. Assumption 1 implies that, for any fixed A, the set

$$\mathcal{D}^N(A) \equiv \left\{\delta : r^N(A, \delta) \geq T\right\} \tag{23}$$

is an upper set in δ. Whenever this set is nonempty, define its lower boundary as

$$\delta^N(A) \equiv \inf \mathcal{D}^N(A). \tag{24}$$

Thus, conditional on productivity, sufficiently labor-biased firms naturally satisfy Factor R and receive the full value of the favorable tax schedule. The role of δ operates through higher employee-payroll intensity, while condition (19) ensures that endogenous changes in the owner-wage component do not reverse this ordering.

[8]The Online Appendix takes Assumption 1 as the general restriction and proves the subsequent results under it. A separate parametric appendix derives primitive conditions under a specific production technology. In the CES case, sufficient substitutability between hired labor and the alternative input delivers the first part of the assumption; the owner-compensation problem determines the additional condition required for the second part.

4.2.2 Manufactured eligibility

Consider instead a firm whose unconstrained low-tax allocation does not satisfy Factor R:

$$r^N(A,\delta) < T. \tag{25}$$

Such a firm can obtain the favorable schedule only by departing from its preferred low-tax allocation. It may increase employee payroll, shift owner income from dividends to wages, reduce reported revenue, alter its production choices, or combine these margins. The optimized value loss from doing so is precisely $C(A,\delta)$.

Manufacturing eligibility is profitable if and only if

$$B(A,\delta) > C(A,\delta). \tag{26}$$

To characterize how this comparison varies with potential scale, define, for firms satisfying (25),

$$Q(A,\delta) \equiv \frac{C(A,\delta)}{B(A,\delta)}. \tag{27}$$

Assumption 2 (Scale single crossing in manufactured eligibility)**.** *Fix δ, and consider a connected region of productivity levels over which firms do not naturally qualify:*

$$r^N(A,\delta) < T.$$

On this region, $Q(A,\delta)$ is continuous and strictly increasing in A, and takes values both below and above one.

Assumption 2 requires the optimized cost of satisfying Factor R to increase with potential scale sufficiently rapidly relative to the benefit of the lower revenue-tax schedule. Importantly, the assumption concerns the fully optimized cost $C(A,\delta)$ and therefore does not require the firm to use any particular margin to satisfy the rule.

The intuition is especially transparent when the cheapest adjustment is owner-income shifting. Suppose, only for illustration, that a non-qualifying firm holds the other components of its unconstrained low-tax allocation fixed and closes the Factor R gap by reporting additional owner wages. The required additional owner wage is

$$m(A,\delta) = \left[T - r^N(A,\delta)\right]\widetilde{R}^L(A,\delta). \tag{28}$$

For a given distance from the threshold, the amount of income that must be shifted grows with firm scale. If the private cost of shifting owner income is convex, the cost of satisfying the same payroll-to-revenue requirement can therefore rise more than proportionally with

scale. Assumption 2 requires this force to dominate any corresponding increase in the value of the tax cut.

The condition need not hold mechanically. For example, if natural Factor R itself rises sufficiently rapidly with productivity, the gap $T - r^N(A, \delta)$ may shrink enough that the amount of manipulation needed to qualify does not increase with scale. The Online Appendix provides the formal results under Assumption 2 and characterizes the forces determining when it holds. A separate parametric appendix derives sufficient conditions from primitives under a specific production technology.

Proposition 1 (Natural and manufactured eligibility)**.** *Suppose Assumptions 1 and 2 hold.*

1. ***Natural eligibility.*** *Whenever the threshold in (24) exists,*

$$\delta_i > \delta^N(A_i) \quad \Longrightarrow \quad r_i^N \geq T,$$

and therefore

$$C(A_i, \delta_i) = 0, \qquad G(A_i, \delta_i) = B(A_i, \delta_i) > 0.$$

2. ***Manufactured eligibility.*** *Fix δ and a connected productivity region over which*

$$r^N(A, \delta) < T.$$

There exists a unique cutoff $\overline{A}^M(\delta)$ satisfying

$$Q(\overline{A}^M(\delta), \delta) = 1. \tag{29}$$

Within this non-natural-eligibility region,

$$A < \overline{A}^M(\delta) \quad \Longrightarrow \quad C(A, \delta) < B(A, \delta) \quad \Longrightarrow \quad G(A, \delta) > 0, \tag{30}$$

whereas

$$A > \overline{A}^M(\delta) \quad \Longrightarrow \quad C(A, \delta) > B(A, \delta) \quad \Longrightarrow \quad G(A, \delta) = 0. \tag{31}$$

At $A = \overline{A}^M(\delta)$, the firm is indifferent between satisfying Factor R and remaining under the high schedule.

The proof is provided in the Online Appendix.[9]

Proposition 1 identifies two distinct sets of firms for which the reform can make Simples more valuable. Firms with sufficiently high δ qualify naturally because their technology generates a sufficiently high payroll-to-revenue ratio. Firms with lower natural

[9]Whether the boundary type $\delta = \delta^N(A)$ itself qualifies depends on the behavior of the optimizer at the cutoff and is immaterial for the results.

Factor R may instead benefit because their scale is sufficiently limited that satisfying the eligibility condition remains inexpensive relative to the tax savings.

The second result is explicitly conditional on the firm remaining in the non-natural-eligibility region. It does not imply that all sufficiently productive firms remain under the high schedule, since a firm outside this region may instead qualify naturally. Nor does it imply that arbitrarily low-productivity firms operate or enter Simples. Proposition 1 characterizes the value created by Factor R conditional on the firm's operating opportunities. Whether that value changes behavior depends on the relevant margin of adjustment.

4.3 Implications for incumbent firms

We first consider firms that were already operating in Simples before the reform. For these firms, participation in the regime is held fixed, and the reform changes the allocation they choose within Simples.

To characterize the firm's post-reform location in the Factor R distribution, define its optimized payoff under the favorable schedule conditional on attaining a particular Factor R:

$$W_L(r; A_i, \delta_i) \equiv \max_{x_i : r(x_i) = r} u_L(x_i; A_i, \delta_i). \tag{32}$$

We impose the following regularity condition.

Assumption 3 (Operating problem and Factor R single-peakedness)**.** *For every* (A_i, δ_i)*:*

1. *the maximization problems defining* Π_H*,* Π_L*,* Π_T*, and* $W_L(r)$ *admit solutions, and the set of attainable Factor R values is an interval containing* T*;*
2. *the low schedule reduces tax liability relative to the high schedule as in Equation 4; and*
3. $W_L(r; A_i, \delta_i)$ *is continuous and strictly single-peaked at* r_i^N*.*[10]

The relevant implication of single-peakedness is that, whenever the unconstrained low-tax optimum lies below T, the best allocation among those satisfying $r \geq T$ lies exactly at the eligibility boundary.

Let r_i^0 denote the firm's optimal Factor R before the reform, when it faces the high schedule.

Proposition 2 (Incumbent responses around the Factor R threshold)**.** *Under Assumption 3:*

[10] The single-peakedness condition is imposed on the indirect payoff after the firm has optimized all other choices conditional on Factor R. It therefore does not require the primitive objective to be globally concave in every choice.

1. ***Firms initially above the threshold.*** *If $r_i^0 \geq T$, the firm does not cross below the threshold after the reform:*

$$r_i^1 \geq T.$$

More precisely:

(a) if $r_i^N \geq T$, the firm chooses its unconstrained low-tax allocation:

$$r_i^1 = r_i^N;$$

(b) if $r_i^N < T$, the eligibility constraint binds and

$$r_i^1 = T.$$

2. ***Firms initially below the threshold.*** *If $r_i^0 < T$:*

(a) if $r_i^N \geq T$, the firm crosses the threshold and chooses its unconstrained low-tax allocation:

$$r_i^1 = r_i^N;$$

(b) if $r_i^N < T$, the firm either remains under the high schedule or bunches exactly at the threshold. It bunches if and only if

$$\Pi_T(A_i, \delta_i) > \Pi_H(A_i, \delta_i),$$

in which case

$$r_i^1 = T.$$

If instead

$$\Pi_T(A_i, \delta_i) < \Pi_H(A_i, \delta_i),$$

the firm remains under the high schedule and retains its pre-reform optimum. At equality it is indifferent.

The proof is provided in the Online Appendix.

The proposition separates two conceptually different responses among initially above-threshold firms. If the firm's unconstrained response to the lower revenue tax continues to satisfy Factor R, the reform operates as an unconstrained tax cut. The firm is free to re-optimize production, input use, and revenue reporting. If instead this re-optimization would reduce Factor R below 28 percent, the eligibility restriction becomes binding and prevents the firm from reaching its preferred low-tax allocation.

For firms initially below the threshold, receiving the tax cut requires a sufficiently large behavioral adjustment. If the firm's unconstrained low-tax optimum already lies above T, it crosses the threshold without being constrained once it does so. If its unconstrained optimum remains below T, then locating further above the threshold provides no additional discrete tax benefit. A firm that finds crossing worthwhile therefore chooses exactly the minimum qualifying Factor R and bunches at T.

An important implication is that the excess mass at the threshold can originate from both sides of the pre-reform Factor R distribution. Firms initially below T can move upward to obtain the favorable schedule, while firms initially above T can re-optimize downward until the eligibility condition binds. Proposition 2 rules out only one movement: an initially above-threshold firm should not cross below the eligibility threshold.

The framework also provides a direct mapping from bunching to observable adjustment margins. Let

$$P_i = wL_i + w_i^o.$$

Any firm locating at the threshold after the reform satisfies

$$P_i^1 = T\widetilde{R}_i^1.$$

Since prior to the reform

$$P_i^0 = r_i^0 \widetilde{R}_i^0,$$

changes between the pre- and post-reform allocations satisfy the accounting identity

$$\Delta P_i - T\Delta\widetilde{R}_i = (T - r_i^0)\widetilde{R}_i^0. \tag{33}$$

For a buncher coming from below, $r_i^0 < T$, so

$$w\Delta L_i + \Delta w_i^o - T\Delta\widetilde{R}_i = (T - r_i^0)\widetilde{R}_i^0 > 0. \tag{34}$$

The firm must therefore close its initial distance from the threshold through some combination of higher employee payroll, higher owner wages, or lower reported revenue. Which margin moves depends on the relative economic costs of the available responses. Their observed changes therefore reveal how firms find it cheapest to satisfy Factor R.

For a buncher coming from above, the right-hand side of (33) is negative. Such a firm would like to reduce its payroll-to-revenue ratio in response to the favorable schedule, but the eligibility restriction prevents it from moving below T.

4.4 Implications for selection into Simples

We next consider potential firms choosing among Simples Nacional (S), Lucro Presumido (P), and an outside option (0). The operating problem inside Simples is exactly the one characterized above. The extensive margin simply embeds its value in the firm's regime choice.

For the purposes of the model, the outside option includes both inactivity and economic activity outside the formal business tax regimes. Consequently, the empirical analysis cannot interpret movement from this option as business creation rather than formalization.

Let K_S denote the fixed cost of formal operation under Simples, including registration and compliance costs. Before the reform, the value of choosing Simples is

$$V_S^0(A, \delta) = \Pi_H(A, \delta) - K_S. \tag{35}$$

After the reform,

$$\begin{aligned} V_S^1(A, \delta) &= \max\{\Pi_H(A, \delta), \Pi_T(A, \delta)\} - K_S \\ &= V_S^0(A, \delta) + G(A, \delta). \end{aligned} \tag{36}$$

Equation (36) is the direct connection between the intensive and extensive margins. Factor R does not introduce a separate motive for entry. It raises the value of choosing Simples by exactly the same object $G(A, \delta)$ that governs the firm's incentive to obtain the favorable tax schedule conditional on already being in the regime.

Proposition 1 therefore has an immediate selection implication. The reform is particularly valuable to firms whose technologies naturally generate a high Factor R and to firms for which eligibility can be manufactured at low cost. The extensive-margin question is whether this increase in V_S is large enough to change the firm's preferred regime.

Let

$$V_P(A, \delta)$$

denote the value of operating under Lucro Presumido, which is unaffected by Factor R, and normalize the outside option to zero.

To characterize the counterfactual regime of firms induced into Simples, we impose a productivity-sorting condition.

Assumption 4 (Productivity sorting across regimes)**.** *For every fixed δ:*

1. *$V_S^0(A, \delta)$ is continuous and strictly increasing in A, and crosses the outside option exactly*

once. Let $A_E^0(\delta)$ *satisfy*

$$V_S^0(A_E^0(\delta), \delta) = 0. \tag{37}$$

2. *The relative value of Lucro Presumido,*

$$D^0(A, \delta) \equiv V_P(A, \delta) - V_S^0(A, \delta), \tag{38}$$

is continuous and strictly increasing in A*, and crosses zero exactly once at* $A_{SP}^0(\delta)$*, with*

$$A_{SP}^0(\delta) > A_E^0(\delta). \tag{39}$$

The first condition captures the standard scale effect in formal entry: sufficiently low-productivity firms do not generate enough surplus to cover the fixed costs of formal operation. The second is a single-crossing condition between the two formal tax regimes. It states that Lucro Presumido becomes relatively more attractive as productivity and potential scale increase. A natural microfoundation is that Lucro Presumido entails higher fixed accounting and compliance costs than Simples but offers a relatively more attractive variable payoff at larger scale. The Online Appendix derives the implications of this sorting condition. A separate parametric appendix provides a microfoundation under a specific functional form.

Assumption 4 implies the following pre-reform allocation, apart from exact indifference points:

$$j_i^0 = \begin{cases} 0, & A_i < A_E^0(\delta_i), \\ S, & A_E^0(\delta_i) < A_i < A_{SP}^0(\delta_i), \\ P, & A_i > A_{SP}^0(\delta_i). \end{cases} \tag{40}$$

Thus, conditional on δ, productivity orders potential firms from the outside option, to Simples, to Lucro Presumido.

We call a firm *induced into Simples* if it chooses S after the reform but would have chosen either 0 or P before the reform.

Proposition 3 (Counterfactual regime of firms induced into Simples)**.** *Under Assumption 4, fix* δ *and consider a firm induced by Factor R to choose Simples.*

1. *If its pre-reform counterfactual is the outside option, then*

$$A_i < A_E^0(\delta). \tag{41}$$

2. *If its pre-reform counterfactual is Lucro Presumido, then*

$$A_i > A^0_{SP}(\delta). \tag{42}$$

Since

$$A^0_E(\delta) < A^0_{SP}(\delta),$$

every induced firm coming from Lucro Presumido has higher productivity than every induced firm coming from the outside option, conditional on δ*.*

The proof is provided in the Online Appendix.

Proposition 3 follows directly from pre-reform sorting and does not depend on the particular mechanism through which Factor R raises the value of Simples. The extensive margin at the lower boundary of the Simples region corresponds to firms that would otherwise choose the outside option, while the extensive margin at the upper boundary corresponds to firms that would otherwise choose Lucro Presumido.

Under the additional local condition that the relevant single-crossing properties continue to hold after the reform, these responses can equivalently be represented as movements in the two regime boundaries. If

$$G(A^0_E(\delta), \delta) > 0, \tag{43}$$

then Simples becomes strictly preferable to the outside option at the old entry threshold, implying

$$A^1_E(\delta) < A^0_E(\delta). \tag{44}$$

Firms in the newly created interval enter Simples rather than choosing the outside option.

Similarly, if

$$G(A^0_{SP}(\delta), \delta) > 0, \tag{45}$$

then Simples becomes strictly preferable to Lucro Presumido at the old upper boundary, implying

$$A^1_{SP}(\delta) > A^0_{SP}(\delta). \tag{46}$$

Firms immediately above the old boundary therefore choose Simples rather than Lucro Presumido.

Propositions 1 and 3 answer different questions. Proposition 1 determines *why* Factor R raises the value of Simples for a firm: because it naturally satisfies the eligibility rule or because it can manufacture eligibility at sufficiently low cost. Proposition 3 determines *where that firm would otherwise operate*, conditional on productivity.

This distinction also clarifies the interaction between productivity and manufactured

eligibility. Assumption 2 implies that, among firms that do not naturally qualify, manufacturing eligibility becomes relatively less attractive as A increases. Assumption 4, meanwhile, implies that firms whose counterfactual is Lucro Presumido have relatively high A. These statements are compatible only if the manufactured-eligibility region extends sufficiently far in productivity to overlap the upper Simples boundary.

For a firm at the pre-reform Simples–Lucro Presumido boundary to be induced into Simples specifically through manufactured eligibility, it must satisfy

$$r^N(A^0_{SP}(\delta), \delta) < T \tag{47}$$

and

$$Q(A^0_{SP}(\delta), \delta) < 1. \tag{48}$$

Equivalently, within the non-natural-eligibility region characterized by Proposition 1,

$$A^0_{SP}(\delta) < \overline{A}^M(\delta). \tag{49}$$

Whether this overlap is economically important is an empirical question.

The framework therefore gives a common interpretation to the empirical exercises that follow. Factor R raises the value of Simples through the same object, $G(A, \delta)$, but this value manifests itself differently depending on the margin under consideration. We first study incumbent firms, for whom participation in Simples is fixed, and the reform reveals how firms re-optimize around the eligibility rule. We then turn to the extensive margin and ask which potential firms are induced to select into Simples, why the reform is particularly valuable to them, and what they would have done in its absence.

5 Intensive Margin

This section focuses on how incumbent firms (those in *Simples Nacional*) respond to the Factor R policy and what we can learn from such behavior. The central feature of the reform is that it created different incentives depending on firms' location in the pre-policy Factor R distribution. Firms initially above the 28% threshold became automatically eligible for a lower revenue tax rate, whereas firms initially below the threshold had to change their payroll-to-revenue ratio to obtain the tax reduction.

In what follow, we present the empirical strategy, where we compare exposed vs. non-exposed firms in a series of *difference-in-differences*. Guided by the prediction in Section 4.3, we estimate the effects on the location in the Factor R distribution, as well as the effects on all Factor R components, separately for low and high pre-policy Factor R.

5.1 Empirical Strategy

In this section, we causally estimate the effect of the Factor R policy on incumbent firms' behavior. We exploit the fact that firms with pre-policy Factor R above 28% were automatically eligible for a tax cut, while firms below 28% faced large tax incentives to increase their payroll-to-revenue ratio. Therefore, we conduct our analysis separately for firms below and above 28%, which we refer to as low and high Factor R, respectively.

Our sample is comprises of firms with positive revenues in all quarters between 2016 and 2019, covering two years before and after the reform. We define our treatment group as firms belonging to Anexo VI for the entire pre-period, and our control group as those belonging to Anexo IV prior to the reform. Table A.1 presents the different activities for treatment and control. Both treated and control correspond to firms in the service sector. The activities in the treated group were all automatically subject to the Factor R rule, while those in the control group were not.

An important distinction between the two groups is worth highlighting. In the pre-period, they are taxed at very different revenue tax rates. Industries in the control group were assumed to have lower profit margins, and therefore faced lower tax rates. This is helpful for our identification, as firms in the control group have no incentives to relabel their industry code to take advantage of the Factor R policy. Table 2 illustrates the baseline differences between the treatment and control group.

Table 2: Descriptive Statistics: Firms in 2017-Q4

	Accumulated 12-month				Current (Quarter)			
	Low FR		High FR		Low FR		High FR	
	Treated	Control	Treated	Control	Treated	Control	Treated	Control
Revenues	308,565	543,037	220,681	513,755	28,403	51,261	20,575	47,432
Owner Wages	17,526	17,673	33,878	29,774	1,558	1,558	2,857	2,475
Employees' Payroll	23,927	38,690	70,277	220,735	2,564	4,145	7,226	22,383
$\mathbf{1}$[Revenues = 0]	0	0	0	0	0	0	0	0
$\mathbf{1}$[Owner Wages = 0]	0.278	0.347	0.092	0.128	0.298	0.371	0.105	0.150
$\mathbf{1}$[Employees' Payroll = 0]	0.581	0.476	0.269	0.100	0.603	0.512	0.289	0.122
$\mathbf{1}$[Total Payroll = 0]	0.182	0.221	0.000	0.000	0.198	0.244	0.003	0.004
N Firms	19,863	29,594	16,320	17,692	19,863	29,594	16,320	17,692

Notes: This table reports descriptive statistics for firms observed in 2017-Q4. Low FR and High FR refer to firms classified according to their pre-reform Factor R. Treated firms are those affected by the reform, while control firms belong to the comparison group. Monetary values are in Brazilian reais.

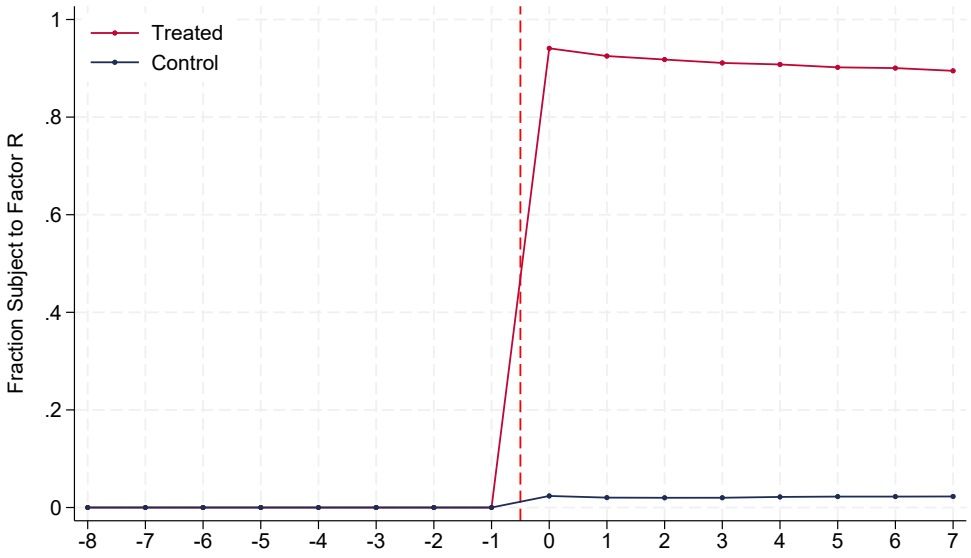
The identification strategy is a simple *difference-in-differences* comparing treatment and control groups before and after the reform. We use a Poisson model as most outcomes can be zero for a significant share of firms.[11][12]

$$y_{iq} = \alpha_i + \lambda_q + \sum_{k \neq -1} \beta_k \mathbf{1}[\text{Treated}_i = 1]\mathbf{1}[q = k] + u_{iq}, \tag{50}$$

where y_{it} represents the outcome, α_i is the firm FE, and λ_q is the quarter FE. Our coefficients of interest are the β_k, which represent the effect of the policy in the log of the difference between the treatment and control groups in quarter k relative to the last quarter of 2017.

Figure 2 shows how the treatment and control groups are differently exposed to the policy. This confirms that almost all firms in the treated group became subject to the Factor R rule, while only a negligible fraction of firms in the control group did, probably due to natural change in economic activity.

Figure 2: Fraction subject to Factor R by pre-policy Anexo



Notes: This Figure shows the fraction of firms subject to the Factor R policy separately by treatment status. The red line shows the group of firms that operated in Anexo VI pre-reform, while the blue line shows those that operated under Anexo IV pre-reform. The x-axis is the quarter relative to the reform, where $t = 0$ represents the first quarter of 2018.

[11] For example, Table 2 shows that 58% of low-Factor R firms in the treated group and 48% in the control have no employees.

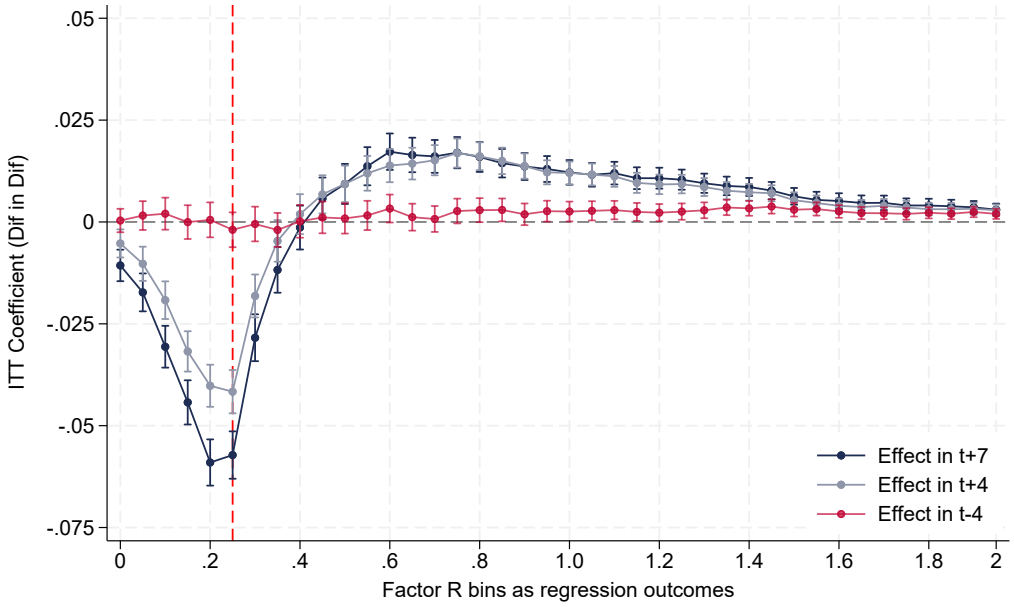
[12] Figures A.2 and A.3 in Appendix A.1 provides the treated and control groups' raw trends for all outcomes.

5.2 Who bunches? Location in the Factor R distribution

Proposition 2 shows that the excess mass at the 28% threshold can originate from *both* sides of the pre-policy Factor R distribution: firms initially below 28% may move up to obtain the tax reduction, while firms initially above 28% may re-optimize downward toward the threshold. This subsection provides the first empirical test of the proposition: we estimate where the firms that end up at 28% would have been located absent the reform, and we quantify how much of the bunching is drawn from each side of the threshold.

To do so, we estimate the difference-in-differences specification in equation (50) using the firm's *location* in the Factor R distribution as the outcome. We discretize the Factor R support into bins and, for each bin cutoff c, define the outcome $y_{iq} = \mathbf{1}[FR_{iq} \leq c]$, an indicator for whether firm i's Factor R in quarter q lies at or below c. This outcome is the empirical cumulative distribution function (CDF) evaluated at c, so estimating equation (50) bin by bin traces the treatment effect on the *entire* distribution of Factor R rather than on a single moment. Figure 3 summarizes these estimates. Each point on the horizontal axis corresponds to a different regression, that is a different outcome $\mathbf{1}[FR_{iq} \leq c]$ indexed by the bin cutoff c, and the vertical axis reports the associated difference-in-differences coefficient β_k, the treatment effect on the share of firms located at or below that bin. Each line collects the β_k for a given event time k: we plot the pre-reform placebo at $t-4$ together with the post-reform effects at $t+4$ and $t+7$. A negative coefficient at cutoff c means the reform reduced the mass of treated firms located at or below c; a positive coefficient means it raised it.

Figure 3: Effect on the Factor R Cumulative Distribution Function



Notes: This figure shows the reduced form coefficients ($\beta_k s$) from Equation 50 where the outcome $y_{iq} = \mathbf{1}[FR_{iq} \leq c]$ and c corresponds to each bin in the Factor R distribution. Then, each dot in the x-axis refers to a different regression. Bins are of size .05, with the first bin including the zero, and the last bin comprising any value above 2 to cover the entire population of firms. The lines plot different ks: the red line is the dif-in-dif coefficient in -4, while the blues are post-period coefficients.

Two features of the dynamics are worth noting. First, the pre-reform line ($t - 4$) is flat and statistically indistinguishable from zero across the entire distribution, confirming that treated and control firms followed parallel paths before the policy and that the estimated effects are not driven by pre-existing differences in where firms were located. Second, the response builds up over time: the displacement of mass toward the threshold is already visible at $t + 4$ but is substantially larger at $t + 7$, consistent with the descriptive evidence that bunching grows year after year as incumbent firms learn to exploit the notch. We end the event window at $t + 7$, the fourth quarter of 2019, for two reasons. It stops the analysis before the COVID-19 shock of 2020, which would otherwise confound the comparison of treated and control firms; and it keeps the incumbent sample large, since requiring firms to be continuously active over a longer window would progressively drop firms and erode the set of incumbents we can follow.

The shape of the curve identifies where the bunching mass comes from. Because the plotted outcome is the CDF, its slope across bins is the treatment effect on the *density* (the PDF): where the curve rises the reform pushed mass into that region, and where it falls the reform pulled mass out. The bunching at 28% therefore appears as the steep positive slope at the threshold. Reading the $t + 7$ line, the effect on the CDF turns increasingly negative as we approach the threshold from below and reaches its trough just at 28%: the reform emptied the region immediately below the threshold, as firms that would have located

there moved up to bunch. Crucially, just above the threshold the curve does not return to zero but turns *positive*. This is only possible if part of the bunching is composed of firms that would otherwise have been located higher up and re-optimized downward toward the threshold.

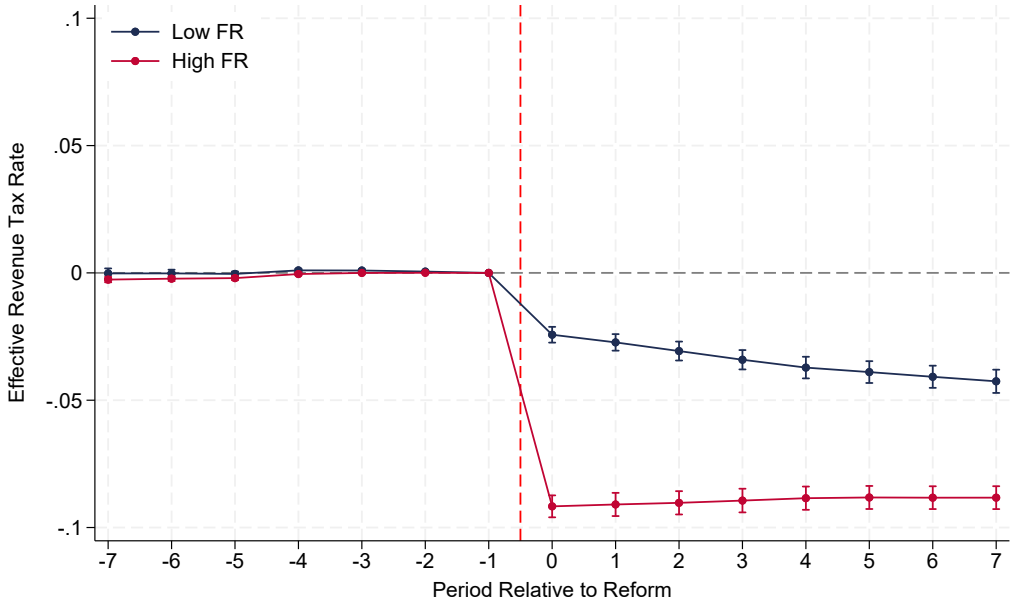
This logic delivers a clean decomposition of the bunching mass by origin. Since treated and control firms are both distributions, total mass is conserved and the coefficient curve begins and ends at zero; the mass added by the positive slope at the threshold must therefore be exactly offset by the mass removed elsewhere. Two regions of the curve have negative slope, and hence correspond to mass being removed. Because the negative slopes must sum to the positive slope, we can attribute the bunching to each side. We find that 84% of the firms that bunch at 28% would have been located below the threshold, while the remaining 16% would have been located above it.

5.3 Behavioral Responses by pre-reform Factor R group

An important implication of the Factor R policy is that it provided two clean quasi-experiments for incumbent firms. Those firms that were already above the threshold pre-policy became automatically eligible for the tax cut. This allows us to estimate how firms respond to a reduction in the revenue tax rate in terms of input demand, reported revenues, etc. On the other hand, those firms below 28% pre-policy face incentives to reach the threshold through, potentially, different behavioral responses specified in Equation 34. Therefore, we estimate Equation 50 separately for low and high-Factor R pre-policy.

We begin by showing the effect on the average revenue tax rate. Figure 4 clearly shows how the policy affected incentives differently depending on the location in the Factor R distribution pre-policy. Those who were above 28% (High FR) face an immediate drop in the revenue tax rate of about 9pp. Those who were below 28% (Low FR) do not face a large and sudden drop, but rather an initially smaller drop which grows over time. This is due to the fact that Low FR firms do not become automatically eligible, but more and more firms enjoy the tax cut as they cross the threshold.

Figure 4: Av. Revenue Tax Rate

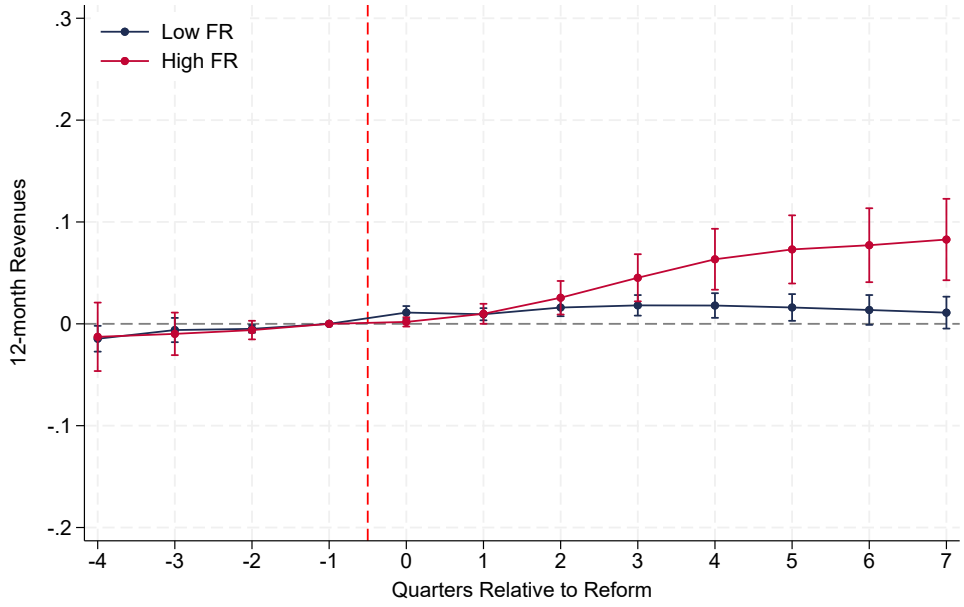


Notes: This figure shows the reduced form coefficients ($\beta_k s$) from Equation 50 where the outcome is the average tax rate (in level) estimated with OLS. The blue line limits the sample to firms that had a Factor R lower than 28% pre-policy. The red line limits the sample to firms that had a Factor R higher than 28% pre-policy. Vertical bars show 95% confidence intervals.

Revenues

We study how the policy affected reported revenues. Figure 5 shows null effects for Low FR firms, proving that reducing reported revenues is not a cheap vehicle to increase the payroll-to-revenue. However, High FR pre-policy see a significant increase in reported revenue of about 10% eight quarters after the reform. This is consistent with firms re-optimizing to a revenue tax cut, either because production becomes more profitable, or because evasion becomes less attractive.

Figure 5: Annual Revenues



Notes: This figure shows the reduced form coefficients ($\beta_k s$) from Equation 50 where the outcome is the 12-month accumulated revenues, corresponding to the Factor R denominator, in levels and estimated through Poisson. The blue line limits the sample to firms that had a Factor R lower than 28% pre-policy. The red line limits the sample to firms that had a Factor R higher than 28% pre-policy. Vertical bars show 95% confidence intervals.

To translate these effects into a revenue elasticity, we need to account for the fact that the revenue tax rate depends on the revenue bracket, which may change due to the reform. We do so by instrumenting the revenue tax rate with treatment status and performing 2SLS on the log of revenues. Note that we are forced to use the log of revenues rather than a Poisson specification to avoid the *forbidden regression* in 2SLS. However, as our sample of incumbent firms comprises firms with positive revenues in all periods, we are not affecting the sample and the reduced form estimates are virtually equivalent for the particular outcome of revenues.

We define the elasticity to the net-of-tax rate between t and $t-1$ as:

$$\varepsilon_{R,1-\tau} = \frac{\mathbb{E}\left[\log\left(\frac{R_{i,t}}{R_{i,-1}}\right) \mid \text{Treated} = 1\right] - \mathbb{E}\left[\log\left(\frac{R_{i,t}}{R_{i,-1}}\right) \mid \text{Treated} = 0\right]}{\mathbb{E}\left[\log\left(\frac{1-\tau_{i,t}}{1-\tau_{i,-1}}\right) \mid \text{Treated} = 1\right] - \mathbb{E}\left[\log\left(\frac{1-\tau_{i,t}}{1-\tau_{i,-1}}\right) \mid \text{Treated} = 0\right]} \tag{51}$$

Where the choice of t recovers different time-horizon elasticities. The numerator captures the firm's response, and the denominator measures the size of the incentives. Equation 52 shows the 2SLS equations that we estimate to recover Equation 51. The underlying identifying assumption is that the treated and control groups would follow parallel trends in the absence of the policy.

$$\begin{aligned}\Delta_{-1,t} \ln y_i &= \alpha_0 + \varepsilon_{R,t} \Delta_{-1,t} \ln(1-\tau_i) + u_{it} \\ \Delta_{-1,t} \ln(1-\tau_i) &= \gamma_0 + \pi \mathbf{1}[\text{Anexo VI} = 1] + v_{it}\end{aligned} \tag{52}$$

We find sizable revenue elasticities with respect to the revenue tax rate. Table 3 shows that two years after the policy, High FR firms have increased reported revenues by 1% for each 1% increase in the net-of-tax rate. Moreover, consistent with the previous patterns, firms seem to be gradually responding as the coefficients grow over time.

Table 3: Revenue Elasticity Estimates Over Time Horizons (High FR)

	12-month Revenue		Quarter Revenue	
	1 Year	2 Year	1 Year	2 Year
ε_R	.392	.887	.994	1.374
SE	(0.045)	(0.063)	(0.067)	(0.084)
CI	[0.30, 0.48]	[0.76, 1.01]	[0.86, 1.13]	[1.21, 1.54]
Reduced Form	.040	.089	0.101	0.137
First Stage (γ_1)	0.101	0.100	0.101	0.100
Observations	34,014	34,014	34,014	34,014

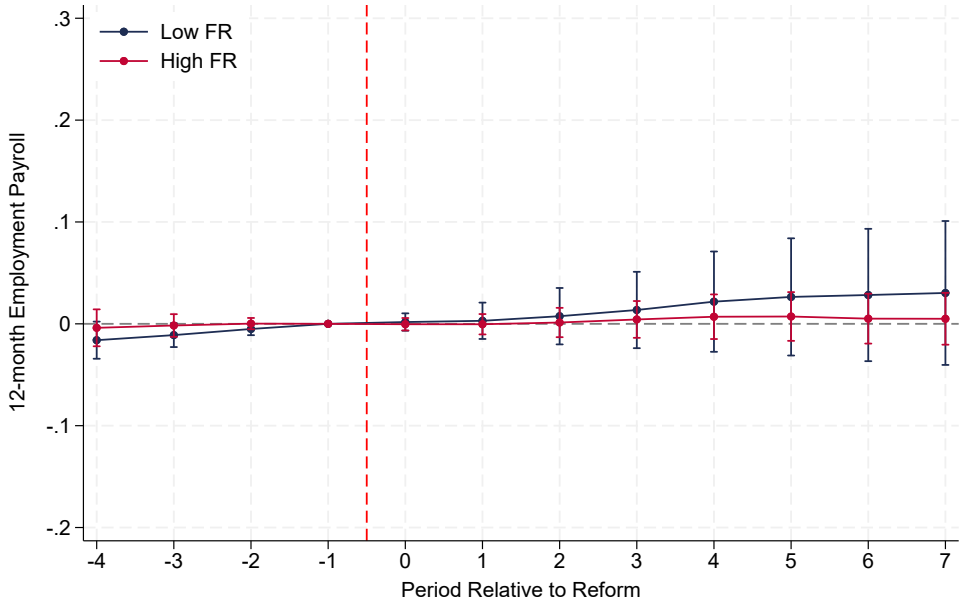
Notes: This table shows the coefficients estimated from Equation 52 for different time horizons. Columns 1 and 2 use as outcome the log of 12-month accumulated revenues (Factor R denominator). Columns 3 and 4 use the monthly average of the last quarter of 2018 and 2019, respectively. The sample contains only firms in the High FR group.

Employees' Payroll

We now turn to the effect on employees' payroll. As Equation 34 shows, this is an alternative for Low FR firms to reach the 28% threshold. Any adjustment in the number of employees or their wages will be reflected here. Similarly, employers could decide to register informal employees or reduce payments under the table within the firm (Feinmann, Hsu Rocha, and Lauletta, 2022). We may also expect an increase in employees' payroll for High FR firms if the increase in reported revenues is due to real activity, and the non-deductibility of labor costs was restraining labor demand considerably.

Figure 6 shows basically no effects on employees' payroll for either group. Neither Low FR nor High FR firms experienced increases statistically different from zero. For the first group, this reveals that adjusting employees' payroll is not the cheapest option to take advantage of the tax rate reduction, undermining the policy goal. The result for the High FR group is also surprising. Despite the fact that revenue taxation distorts input demand and that we find a 10% increase in reported revenues, employees' payroll does not respond to the policy. This reveals that firms are more reactive in other margins.

Figure 6: Employees' Payroll



Notes: This figure shows the reduced form coefficients ($\beta_k s$) from Equation 50 where the outcome is the 12-month accumulated employees' payroll, corresponding to the component in the Factor R numerator, in levels and estimated through Poisson. The blue line limits the sample to firms that had a Factor R lower than 28% pre-policy. The red line limits the sample to firms that had a Factor R higher than 28% pre-policy. Vertical bars show 95% confidence intervals.

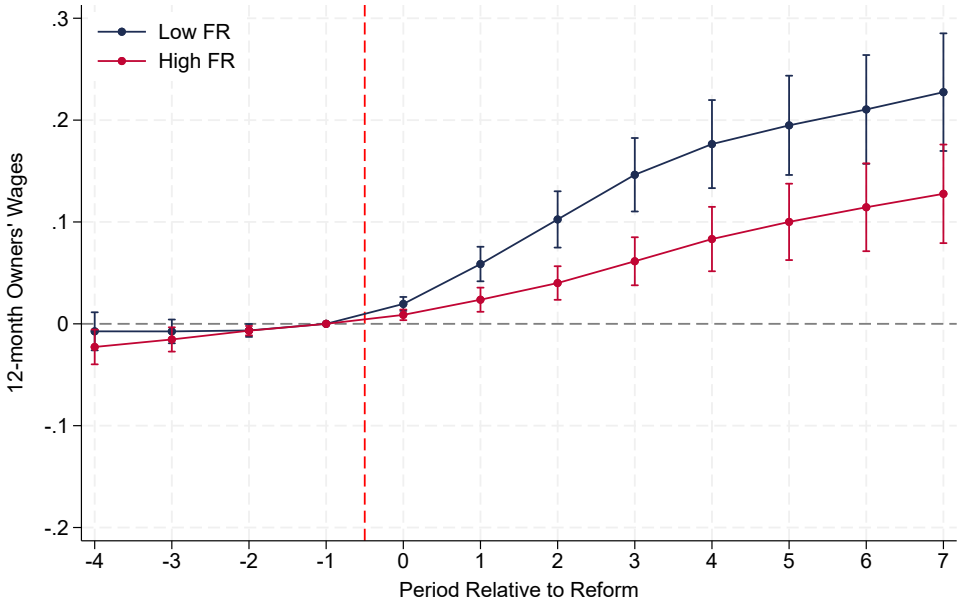
Owner Wages

The other important behavioral response is how firm owners adjust their payments between dividends and wages when it can affect their overall tax rate. Given that Low FR firms neither reduced reported revenues nor increased employees' payroll, Equation 34 implies that owners must pay themselves in wages to increase the payroll-to-revenue ratio and obtain the tax cut. For firms above 28% pre-policy, the responses depend on whether they belong to the constrained or unconstrained group, and whether the former group finds owner wages the cheapest way to relax the constraint.

Figure 7 has large and growing increases in owner wages for Low FR firms, reaching 25% two years after the reform. Interestingly, High FR firms also exhibit a significant increase in owner wages. As mentioned earlier, this may be explained by a considerable mass of constrained firms above the threshold. Figure A.4 in Appendix A.1 shows evidence that firms right above the threshold explain most of the owner wages increase, while firms far from the threshold explain most of the revenue increase.[13]

[13] An alternative explanation (not modeled in our framework) could be that owners use some fixed rules for self-payments (e.g. 20% wages 80% dividends). If so, the increase in owner wages for High FR firms may be mechanically related to the increase in revenues. Consistently, Figure A.3d shows that the ratio of owner wages to revenues remains totally flat for High FR firms.

Figure 7: Owner Wages



Notes: This figure shows the reduced form coefficients ($\beta_k s$) from Equation 50 where the outcome is the 12-month accumulated owner wages, corresponding to the component in the Factor R numerator, in levels and estimated through Poisson. The blue line limits the sample to firms that had a Factor R lower than 28% pre-policy. The red line limits the sample to firms that had a Factor R higher than 28% pre-policy. Vertical bars show 95% confidence intervals.

The comparison between the behavioral responses in owner wages and employees' payroll reveals how cheap it is for firms in simplified tax regimes to exploit loopholes. This is an important result for thinking about the proper design of such regimes, as exemptions, differential schemes, and discretionary rules may create loopholes that undermine policy goals.

Reporting vs. Real Responses

One striking result is the significant revenue response together with the null employment response. This finding raises a natural question: what explains the increase in firms' revenues? On the one hand, firms could be increasing other inputs, such as owners' effort and materials. If so, this would reveal that non-labor inputs are more sensitive to the distortion induced by revenue taxation due to non-cost deductibility. On the other hand, the increase in reported revenue may simply reflect a reduction in under-reporting, consistent with models in which optimal evasion compares the marginal cost of evasion to the tax rate.

6 Extensive Margin: Firm entry

The previous section shows that Low-FR incumbents respond to the eligibility incentive predominantly through owner-income shifting rather than employee payroll or revenue

reporting. High-FR firms, meanwhile, increase reported revenues following the tax cut but exhibit no detectable employment response.

While this is a very important piece of evidence on incumbent firms' behavior, it is silent about why firms select into STRs in the first place. In Section **??**, Proposition 1 formalized that the Factor R reform made *Simples Nacional* more attractive for labor-intensive firms, and those that can cheaply manufacture their eligibility.[14]Moreover, understanding the counterfactual of these groups is key, as moving firms from inactivity/informality to a STR has very different implications than switching tax regimes.

In what follows, we first explain the empirical strategy, highlighting how we address the main challenge to identify the motives for firms' selection into *Simples Nacional*. We decompose our difference-in-differences estimates into the ITT effects of new firms that would have entered regardless of the policy (*always-takers/inframarginals*) from the selection of firms that entered due to the Factor R rule (*compliers/marginals*). Second, we study firms' counterfactuals regarding alternative tax regimes, industry and contract relabeling, and real business registration.

6.1 Empirical Strategy

We leverage the fact that eligibility to the Factor R policy depended on firms' economic activity. This means that some industries were more exposed to the policy than others. The law establishes which activities are covered by each Anexo.[15] Unfortunately, firms do not report their economic activity in the tax form, but only which Anexo corresponds to them. Therefore, we will use the 7-digit industry code (*CNAE*), reported at the registration stage, to map the economic activity defined in the law.[16] For non-exposed industries, we follow the analogous approach, mapping 7-digit CNAE to Anexo IV. [17]

We then perform a difference-in-differences analysis at the industry level, with outcomes constructed from the cohort of new firms in each year. A new firm is defined as having positive revenues at some point during the registration year. This allows us to capture a meaningful dimension of entry, as many small firms may register but never carry

[14]Inactivity and informal firms are equivalent for the purpose of the model. Lucro Presumido is a presumptive profit tax regime with a revenue tax depending on the activity. However, it has no simplification whatsoever, meaning that payroll taxes, state taxes, and others are not unified. We provide a full characterization in Section 2.1.

[15]Art. 18 de la Lei Complementar 123/2006.See Appendix for full description.

[16]Reported CNAEs must be updated if firms change their main activities. For our purposes, the enforcement of updates is irrelevant, as we focus on new entrants.

[17]For robustness, we also perform a data-driven approach to define different groups of exposed and non-exposed industries. For the first group, we select industry codes that have a large share of all firms in Anexo VI during the pre-policy period. For the latter, we do the same, but based on the shares of all firms in Anexo III and IV pre-reform, thereby allowing us to verify that new firms are not merely relabeling industry codes (see Online Appendix).

out economic activity. The regression equation for the dynamic difference-in-differences looks as follows:

$$y_{ct} = \alpha_c + \lambda_t + \sum_{k \neq 2017} \beta_k \mathbf{1}[\text{Treated}_c = 1]\mathbf{1}[t = k] + u_{ct} \tag{53}$$

Where y_{ct} is the outcome of interest for the industry code c, in year t. We include fixed effects by industry (α_c) and time (λ_t). β_k measures the gap between exposed and non-exposed industries relative to the 2017 gap. Figure A.5 in Appendix A.1 shows the raw trends, verifying the responses are driven by the treated industries rather than the control. Importantly, β_k does not directly address our main question: whether the additional firms induced by the policy entered because they are labor-intensive or because they can manufacture their eligibility through income shifting. The reason is that β_k mixes compliers' characteristics with the behavioral responses of always-takers to the policy (those firms that would have entered Simples Nacional regardless of the policy). We leverage our results for incumbent firms to separately identify these two components.

Marginal Entrants vs. Inframarginal Behavioral Responses

As we are interested in understanding marginal entrants (new firms due to the policy), it is important to be precise about how to interpret β_k. The Factor R policy makes certain economic activities more attractive, as now they are subject to a more generous tax regime. Assuming standard monotonicity (the policy never deters entry of a firm that would otherwise have entered), the potential entrants partition into three types:

$$\begin{aligned} \text{never-takers (NT):} \quad & D(0) = 0,\ D(1) = 0, \\ \text{compliers (C):} \quad & D(0) = 0,\ D(1) = 1, \\ \text{always-takers (AT):} \quad & D(0) = 1,\ D(1) = 1. \end{aligned}$$

Where $D_{ic}(w) \in \{0, 1\}$ is the entry indicator of potential firm i under treatment status w. The compliers are the *marginal entrants* (they enter because of the policy); the always-takers are the *inframarginal entrants* (they would have entered in any case). Because the policy may also have changed how the inframarginal entrants behave once they entered, separately identifying the average treatment effect on the always-takers (to the entry decision) from the compliers' characteristics is challenging.

In a treated industry after 2018 the set of *observed* new firms is $AT \cup C$, and for each we observe any outcome $Y(1)$, such as the Factor R value. Absent the policy, the same industry's new firms would have been the always-takers only, with outcome $Y(0)$. Define

$$M \equiv \mathbb{E}[Y(1) \mid AT \cup C], \qquad \bar{Y}^0_{AT} \equiv \mathbb{E}[Y(0) \mid AT].$$

M is the mean outcome of treated post-period entrants, read directly from the data. $\bar{Y}^0_{AT}$ is the mean outcome the treated industries' entrants would have had absent the policy. The post-period event-study coefficient β_k from the outcome regression identifies

$$\beta_k^{DiD} \;=\; M_k - \bar{Y}^0_{AT}.$$

Let N_1 be the number of new firms in a treated industry-year after 2018 and let N_0 be the counterfactual count absent the policy, i.e. the number of always-takers. By definition $N_1 = N_{AT} + N_C$ and $N_0 = N_{AT}$, so the count difference-in-differences identifies the number of marginal entrants directly:

$$N_C \;=\; N_1 - N_0,$$

where $N_1 - N_0$ is exactly the post-period coefficient of the count regression. The type shares among observed treated entrants are therefore *point-identified*:

$$\pi_{AT} \;=\; \frac{N_{AT}}{N_1} \;=\; \frac{N_0}{N_1}, \qquad \pi_C \;=\; \frac{N_C}{N_1} \;=\; \frac{N_1 - N_0}{N_1}, \qquad \pi_{AT} + \pi_C = 1.$$

The observed treated mean is the type-weighted average of the two groups' treated outcomes:

$$M \;=\; \pi_{AT}\,\mathbb{E}[Y(1) \mid AT] \;+\; \pi_C\,\mathbb{E}[Y(1) \mid C]. \tag{54}$$

Subtracting $\bar{Y}^0_{AT} = (\pi_{AT}+\pi_C)\bar{Y}^0_{AT}$ from both sides and adding and subtracting $\pi_C\,\mathbb{E}[Y(1) \mid AT]$ gives the target decomposition of the outcome DiD:

$$\beta^{DiD} \;=\; \underbrace{\Big(\mathbb{E}[Y(1) \mid AT] - \bar{Y}^0_{AT}\Big)}_{\text{(I)}} \;+\; \underbrace{\pi_C\Big(\mathbb{E}[Y(1) \mid C] - \mathbb{E}[Y(1) \mid AT]\Big)}_{\text{(II)}}. \tag{55}$$

Term (I) is the intensive-margin response of firms that would have entered regardless. We denote this behavioral response by $\Delta_{AT} \equiv E[Y(1) \mid AT] - E[Y(0) \mid AT]$. Term (II) is the contribution of composition to the reduced-form effect. Dividing it by the complier share delivers our main object of interest: the selection gap. It reveals how those new entrants induced by the policy differ from those firm that would have entered anyway. Their differences in behavior and characteristics shed light on the entry motives.

To isolate the two terms in Equation 55, we rely on two additional pieces of information. First, for outcomes that may respond to the policy, we use the behavioral responses of incumbent firms estimated in Section 5. Rather than assuming that inframarginal entrants would not have changed their behavior after the reform, we assume that, absent the reform, the Low- versus High-FR composition of inframarginal entrants would match that observed among pre-reform entrants, and that conditional on this status their behavioral

response equals the corresponding incumbent response. In particular, we use the estimated incumbent responses in reported revenues, employees' payroll, and owner wages to recover term (I) in Equation 55.[18] For outcomes that are predetermined with respect to the policy, we instead set $\Delta_{AT} = 0$.

Second, the difference-in-differences estimate for the number of new firms identifies the share of observed post-reform entrants that are marginal to the policy. Let N_1 denote the number of entrants observed under the reform and N_0 the number that would have entered absent the reform. Since

$$N_1 = N_{AT} + N_C \qquad \text{and} \qquad N_0 = N_{AT},$$

the complier share among observed entrants is

$$\pi_C = \frac{N_C}{N_1} = \frac{N_1 - N_0}{N_1}. \tag{56}$$

In our empirical implementation, using the log-number-of-firms specification,

$$\pi_C = 1 - \exp\{-\beta^{\log N}\}.$$

Given Δ_{AT} and π_C, Equation (55) directly identifies term (II):

$$\text{(II)} = \beta^{DiD} - \Delta_{AT} = \pi_C \left[E[Y(1) \mid C] - E[Y(1) \mid AT] \right]. \tag{57}$$

Dividing by the share of marginal entrants therefore recovers the difference between marginal and inframarginal entrants under the same post-reform environment:

$$E[Y(1) \mid C] - E[Y(1) \mid AT] = \frac{\beta^{DiD} - \Delta_{AT}}{\pi_C}. \tag{58}$$

We refer to this object as the *selection gap*. It is our main object for characterizing entry motives: it measures whether the firms induced to enter by Factor R differ from firms that would have entered Simples regardless of the reform, after netting out the behavioral response to the policy that both groups may exhibit.

A second useful comparison asks how marginal entrants under the reform differ from the entrants that would have been observed in its absence. Combining the selection gap

[18] This is not a theoretical assumption, but rather an empirical assumption. We do not observe how inframarginal new firms would have behaved in the absence of the policy, but we rely on our incumbents' responses as a proxy.

with the behavioral response of inframarginal entrants gives

$$E[Y(1) \mid C] - E[Y(0) \mid AT] = \Delta_{AT} + \frac{\beta^{DiD} - \Delta_{AT}}{\pi_C}. \tag{59}$$

The selection gap therefore isolates differences in composition under the same policy environment, while Equation (59) compares the firms induced to enter by Factor R with the entrants that would have been observed in its absence.

6.2 Extensive margin results

We first estimate Equation 53 using the new number of firms as the outcome variable. This recovers the number of new firms due to the policy, from which we derive the share of always-takers and compliers (π_{AT} and π_C, respectively). Columns (1) and (2) in Table 4 show large effects in the number of new firms in exposed industries post-reform, both in levels and in logs.

Columns (3), (4) and (5) estimate the β_k^{DiD}s for Factor R-related outcomes to show that the cohorts of new firms in the exposed industries changed relative to the non-exposed industries in a way that is fully consistent with the policy. New firms in treated industries become 20-24pp more likely to have a Factor R above 28%, which basically doubles the baseline likelihood. The vast majority locate right above the threshold and come from the lowest part of the Factor R distribution. The latter result helps rationalize Figure 1, where a considerable share of bunchers seems to come from the missing mass at zero Factor R. While incumbent bunchers were more likely to come from right below the threshold, the new entry of firms explains the large missing mass at the lower part of the Factor R distribution.

New Entry and Decomposition

Table 4: Extensive-Margin Difference-in-Differences Estimates

	(1) # New Firms	(2) Log New Firms	(3) Pr(FR > .28)	(4) Pr(.28 < FR < .4)	(5) Pr(FR < .05)	(6) Owner Wages/Revenues	(7) Employees Payroll/Revenues
Pre-period							
2016	-33.184**	-0.112	-0.010	-0.008*	0.008	0.002	-0.011**
	(14.138)	(0.092)	(0.011)	(0.005)	(0.014)	(0.005)	(0.005)
Post-period							
2018	150.135***	0.379***	0.209***	0.107***	-0.161***	0.081***	0.000
	(36.131)	(0.078)	(0.014)	(0.009)	(0.014)	(0.006)	(0.005)
2019	206.167***	0.452***	0.240***	0.131***	-0.175***	0.093***	-0.006
	(52.391)	(0.069)	(0.018)	(0.014)	(0.014)	(0.007)	(0.004)
Mean Dep. Var. Treated	237.29	4.15	0.24	0.06	0.53	0.13	0.05
Mean Dep. Var. Control	266.63	4.05	0.26	0.07	0.49	0.08	0.11
FE by Year	✓	✓	✓	✓	✓	✓	✓
FE by Industry	✓	✓	✓	✓	✓	✓	✓
Reweighted	X	X	✓	✓	✓	✓	✓
Observations	472	472	466	466	466	466	466

Notes: This table reports event-study difference-in-differences estimates of the Fator R reform on extensive-margin outcomes. Each column corresponds to a separate regression. Coefficients are interactions of year indicators with treatment exposure (`FR_act`), with 2017 as the omitted reference year. All specifications absorb year and industry (CNAE) fixed effects. Standard errors clustered at the industry level in parentheses. *Mean Dep. Var.* rows report the 2016 baseline mean of the dependent variable for treated and control groups. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Columns (6) and (7) estimate the β_k^{DiD}s for the different components of Factor R. This is the first step in identifying what motivates the new entry of firms. We find that new firms almost doubled the share of owner wages over revenues, but they do not change employees' payroll over revenues at all. We now turn to tease apart how much of this effect is explained by infra-marginal firms changing their behavior due to the policy, versus the composition of the new firms induced by the policy, following Equation 55.

As explained above, we recover term (I) using the behavioral responses of incumbent firms estimated in Section 5, weighting the estimates by the pre-policy share of new entrants located below and above the 28% threshold. Table XX in the Online Appendix reports the full set of incumbent difference-in-differences coefficients used in this calculation. Table 5 then presents the decomposition of β^{DiD}, together with the resulting selection gap and the comparison between marginal and no-reform entrants across several outcomes.

Table 5: Behavioral and compositional decomposition

	$\Pr(FR > 0.28)$		Owner W/R		Employee P/R	
	2018	2019	2018	2019	2018	2019
Total effect, β^{DiD}	0.209	0.240	0.081	0.093	0.000	−0.006
Behavioral component, (I)	0.066	0.109	0.019	0.027	−0.001	−0.001
Composition component, (II)	0.143	0.131	0.062	0.066	0.001	−0.005
Composition share	68%	55%	76%	71%	—	—
$E[Y(1) \mid C] - E[Y(1) \mid AT]$	0.453	0.360	0.197	0.181	0.003	−0.014
$E[Y(1) \mid C] - E[Y(0) \mid AT]$	0.519	0.469	0.216	0.208	0.002	−0.015

Notes: Term (I) is the behavioral response of inframarginal entrants, proxied using the incumbent estimates from Section 5. Term (II) is the residual of the total difference-in-differences effect after subtracting (I). The share of marginal entrants is recovered from the difference-in-differences estimate for the number of new firms ($\pi_C = 0.315$ in 2018 and 0.364 in 2019). The selection gap compares marginal and inframarginal entrants under the same post-reform environment (fifth row). The marginal vs. no-reform gap additionally incorporates the behavioral response of inframarginal entrants and compares marginal entrants with the entrants that would have been observed absent the reform (sixth row).

Consistent with the policy incentives, we see that, even when only about a quarter of pre-policy entrants had a Factor R above 28%, the selection gap is very large. Compliers are 45pp more likely to enter with a Factor R above 28% than inframarginal entrants, even after accounting for their behavioral responses. Moreover, marginal entrants are no different from inframarginals in terms of labor intensity. Rather, marginal firms have a 20 pp larger owner wages-to-revenue ratio than inframarginal firms.

What motivates marginal entry? Proposition 1 identifies two mechanisms through which Factor R can raise the value of Simples. Firms may benefit because their unconstrained choices naturally generate a sufficiently high Factor R, which is more likely for sufficiently labor-biased technologies, or because they can manufacture eligibility at low cost. Empirically, we find no evidence that marginal entrants are selected on hired-labor intensity. Instead, their distinguishing Factor R component is owner compensation, consistent with selection on the income-shifting/manufactured-eligibility margin.

Counterfactual

Understanding what marginal entrants would have done in the absence of the reform is central to evaluating its extensive-margin effects. Proposition 3 provides a productivity ordering of these counterfactuals: conditional on the labor-bias parameter, firms induced from *Lucro Presumido* are higher-productivity than firms induced from the outside option. Empirically, we therefore examine whether increased entry into Simples is accompanied

by displacement from alternative formal tax regimes or instead by an increase in firms coming from inactivity/informality.

Table 6 shows the difference-in-differences result for exposed and non-exposed industries regarding new firms by tax regime. The reduction in the number of new firms in Lucro Presumido (column 3) accounts for about 35% of the increase in the number of new firms in the simplified tax regime (column 2). This means that an important part of the new firms in Simples Nacional induced by the policy would have operated in the alternative tax regime.

Table 6: Extensive-Margin: New Firms Entry

	(1) Subject to FR	(2) # Simples Nacional	(3) # Lucro Presumido	(4) # Total
Pre-period				
2016	0.001	-25.244**	-3.550	-28.794**
	(0.006)	(10.820)	(4.672)	(13.138)
Post-period				
2018	0.565***	129.444***	-40.079***	89.365***
	(0.022)	(31.568)	(11.910)	(23.927)
2019	0.543***	180.055***	-48.497***	131.558***
	(0.025)	(46.114)	(17.018)	(35.782)
Mean Dep. Var. Treated	0.009	206.953	149.814	356.767
Mean Dep. Var. Control	0.000	208.473	13.255	221.727
FE by Year	✓	✓	✓	✓
FE by Industry	✓	✓	✓	✓
Observations	472	564	564	564

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

While the substitution of new entrants in one regime for another is prevalent and straightforward, it is not the only possible counterfactual. Incumbent firms in Lucro Presumido may switch to Simples Nacional (showing up as new entrants), firms close to graduating from Simples Nacional may prefer to not to do so, and existing firms in Simples Nacional may become less likely to close. Although we cannot tease apart these alternative channels, Table A.2 shows the changes in stock resulting from the policy, which summarizes all such channels. Accounting for the small differential trend in the stock of firms in Simples Nacional, Lucro Presumido accounts for 35%-60% of the increase in the stock of firms in Simples Nacional.

Another potential counterfactual is what is usually referred to as *pejotizacao* in Brazil. This is the situation in which an employee is hired through a contractor arrangement,

and wage payments are processed as a business-to-business transaction. This allows the employer to not make contributions on behalf of the employee, and the worker to pay business taxes rather than personal income tax. As the Factor R policy reduced the revenue tax rate, it increased the incentive for employees to switch contract types. We test for this by checking whether the likelihood of coming from an employment contract changed with the policy. Table A.3 shows no compositional effect, suggesting that the marginal new entrant is not more likely to be switching contracts.

7 Revenue Implications

We combine our estimates into a back-of-the-envelope calculation of the revenue implications of the Factor R reform. We decompose the total change in Simples Nacional revenue-tax collection, relative to a no-reform counterfactual, into a mechanical component and the different behavioral responses we have documented. The mechanical term isolates the change in liabilities holding firm behavior fixed at its pre-reform level; the behavioral terms then add, on top of the mechanical baseline, the revenue consequences of each margin the reform activated. We organize the exercise around two populations affected by distinct incentives: incumbent firms, split by whether their pre-policy Factor R was above or below the 28% threshold, and new entrants, split by whether they represent genuinely new activity or a reallocation from other tax regimes. We compute the exercise separately for 2018 and 2019, in each case against that year's no-reform counterfactual.

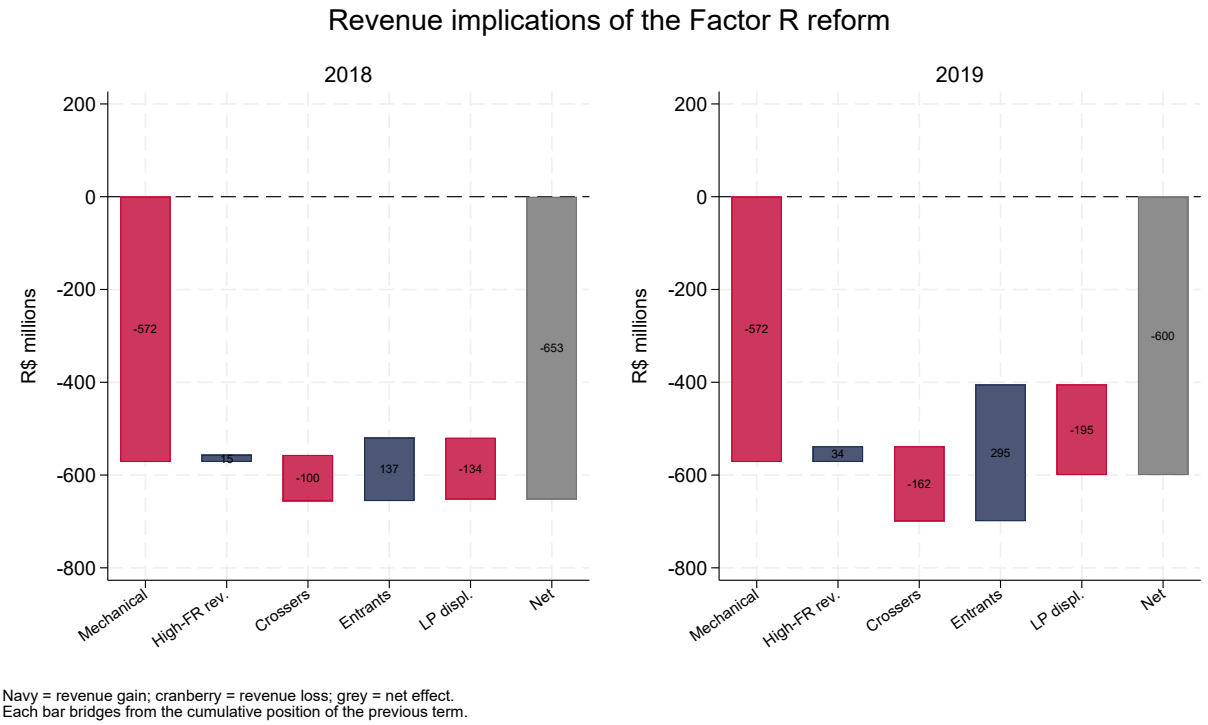
$$\begin{aligned}\Delta\text{Rev}_t = & \underbrace{-\left(\tau_{VI}-\tau_{III}\right)R^{hi}}_{\text{(1) mechanical}} + \underbrace{\tau_{III}\,\rho_t\,R^{hi}}_{\text{(2a) revenue response, high-FR}} - \underbrace{\left(\tau_{V}-\tau_{III}\right)c_t\,R^{lo}}_{\text{(2b) crossers, low-FR}} \\ & + \underbrace{\tau_{III}\,\bar{r}_e\,N_t^{in}}_{\text{(3a) pure entrants}} - \underbrace{\left(\tau_{LP}-\tau_{III}\right)\bar{r}_e\,N_t^{LP}}_{\text{(3b) LP displacement}}\end{aligned} \tag{60}$$

Equation (60) has five terms. The *mechanical* term (1) captures the automatic loss from incumbents with pre-policy Factor R above 28%, who are reassigned from the pre-reform schedule (τ_{VI}) to Anexo III (τ_{III}) without changing behavior; R^{hi} is their pre-reform reported revenue and the term is unambiguously negative. Term (2a) is the behavioral response of these same high-FR incumbents, who increase reported revenues by a fraction ρ_t (our reduced-form revenue response); the additional base is taxed at the new, lower rate τ_{III}, so the term is positive. Term (2b) captures low-FR incumbents who cross the threshold: a fraction c_t move from Anexo V to Anexo III, and since reported revenues are essentially unchanged below the threshold, the effect is a pure rate reduction ($\tau_V - \tau_{III}$) applied to their pre-reform revenue base R^{lo}, yielding a loss. The last two terms are the extensive margin, where $\bar{r}_e$ is an entrant's average revenue and the counts come directly

from the entry regressions (Table 6). Term (3a) is the gain from genuinely new firms (the increase in entrants from inactivity/informality N_t^{in}). Term (3b) is the loss from firms displaced out of Lucro Presumido, N_t^{LP}: because these firms would have paid taxes under LP absent the reform, the relevant cost is only the differential $(\tau_{LP} - \tau_{III})$, not the full Anexo III liability. Incumbent shares and revenue bases are computed separately for the high- and low-FR groups, and entrant counts are cumulated across cohorts so that each year's figure reflects the stock of policy-induced firms then active.

Shared inputs. The exercise uses a stock of $N_{\text{trat}} = 96{,}000$ treated (Anexo VI) incumbents in the pre-period, split into $s_{hi} = 0.30$ above and $s_{lo} = 0.70$ below the 28% threshold according to their pre-policy Factor R. Group-specific average revenues are $\bar{r}_{hi} = 220{,}681$ for high-FR and $\bar{r}_{lo} = 308{,}565$ for low-FR firms, taken from the treated columns of Table 2 (accumulated 12-month). Tax rates are the pre-reform Anexo VI rate $\tau_{VI} = 15\%$, the plain Anexo III rate $\tau_{III} = 6\%$, the payroll-inclusive Anexo III rate $\tau_{III}^{P} = 9\%$ (applied to firms that report pro-labore to reach or hold above the threshold), the Anexo V rate $\tau_{V} = 15\%$, and the Lucro Presumido effective rate $\tau_{LP} = 14\%$. On the extensive margin, effects are scaled by the number of treated CNAEs, $0.6 \times 86 \approx 51.6$.

Figure 8: Revenue Decomposition



Notes: Back-of-the-envelope decomposition of the change in Simples Nacional revenue-tax collection relative to a no-reform counterfactual, computed separately for 2018 and 2019 following Equation60. Red bars represent negative numbers, blue bars represent positive numbers. Each bar builds on the previous one. The gray bar represents the total effect. All figures in millions of R$ per year. The mechanical term and the high-FR revenue response are evaluated at the plain Anexo III rate (6%), as these margins involve no additional payroll reporting; the crossing, entry, and displacement terms are evaluated at the payroll-inclusive effective rate (9%), since these firms report pro-labore to reach or remain above the 28% threshold. See text for sources of each component.

8 Conclusions

This paper uses Brazil's 2018 Factor R reform as a laboratory to learn about firm behavior in presumptive (revenue-based) tax regimes, where the tax base is mechanically linked to reported revenues and where owners can often re-optimize both production and reporting choices. Exploiting the reform's two quasi-experiments, we recover (i) an intensive-margin elasticity of reported revenues to the net-of-tax rate in a setting where the statutory incentive is a clean revenue-tax cut, and (ii) an income-shifting elasticity in a setting where eligibility depends discontinuously on a manipulable payroll-to-revenue ratio. Empirically, the data show a sharp and growing bunching response at the 28% threshold, a large revenue elasticity (reaching about 1.6 over a three-year horizon), and sizable income-shifting responses in owners' compensation when crossing incentives are salient.

Beyond the reduced-form magnitudes, the central lesson is about which margins move under different incentives inside presumptive regimes. When the reform changes the ef-

fective revenue tax rate mechanically for already-eligible firms, the adjustment shows up in reported revenues—but not in employment or employees' wages—indicating that the elasticity of the presumptive base can be large even when real-side labor inputs are essentially flat. When, instead, the reform creates a notch in eligibility, firms respond primarily by manipulating the eligibility statistic through owners' reported wages (and, to a much smaller extent, employees' payroll), with little evidence of offsetting adjustments in reported revenues despite the incentive to do so. Taken together, these patterns highlight that (i) the behavioral content of "tax-base elasticities" in presumptive systems depends critically on the underlying menu of reporting and organizational margins, and (ii) compensation relabeling within the firm can be a first-order response whenever statutory rules explicitly condition on payroll shares.

More broadly, our approach illustrates the value of combining business tax declarations with comprehensive payroll records and third-party information to disentangle real activity from reporting and classification responses—an identification problem that is particularly acute in presumptive regimes. An important direction for future work is to map these elasticities to firm primitives and heterogeneity in production technologies (owner-labor intensive vs hired-labor intensive), and to conduct counterfactual exercises.

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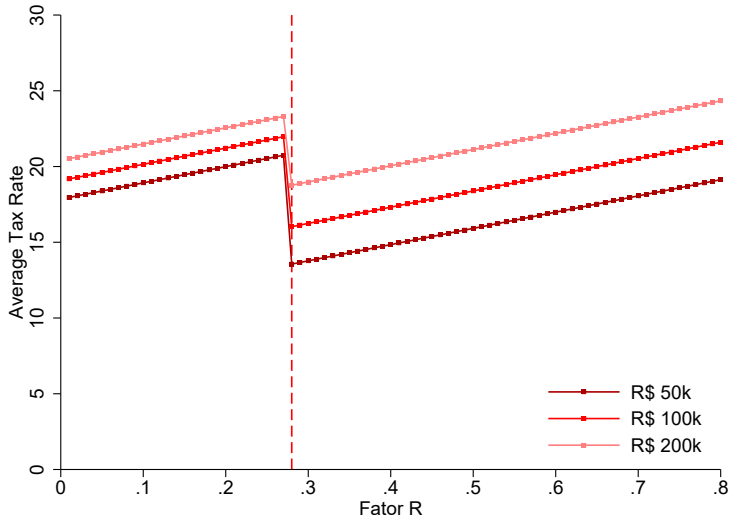
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A Appendix A: Additional Figures and Tables

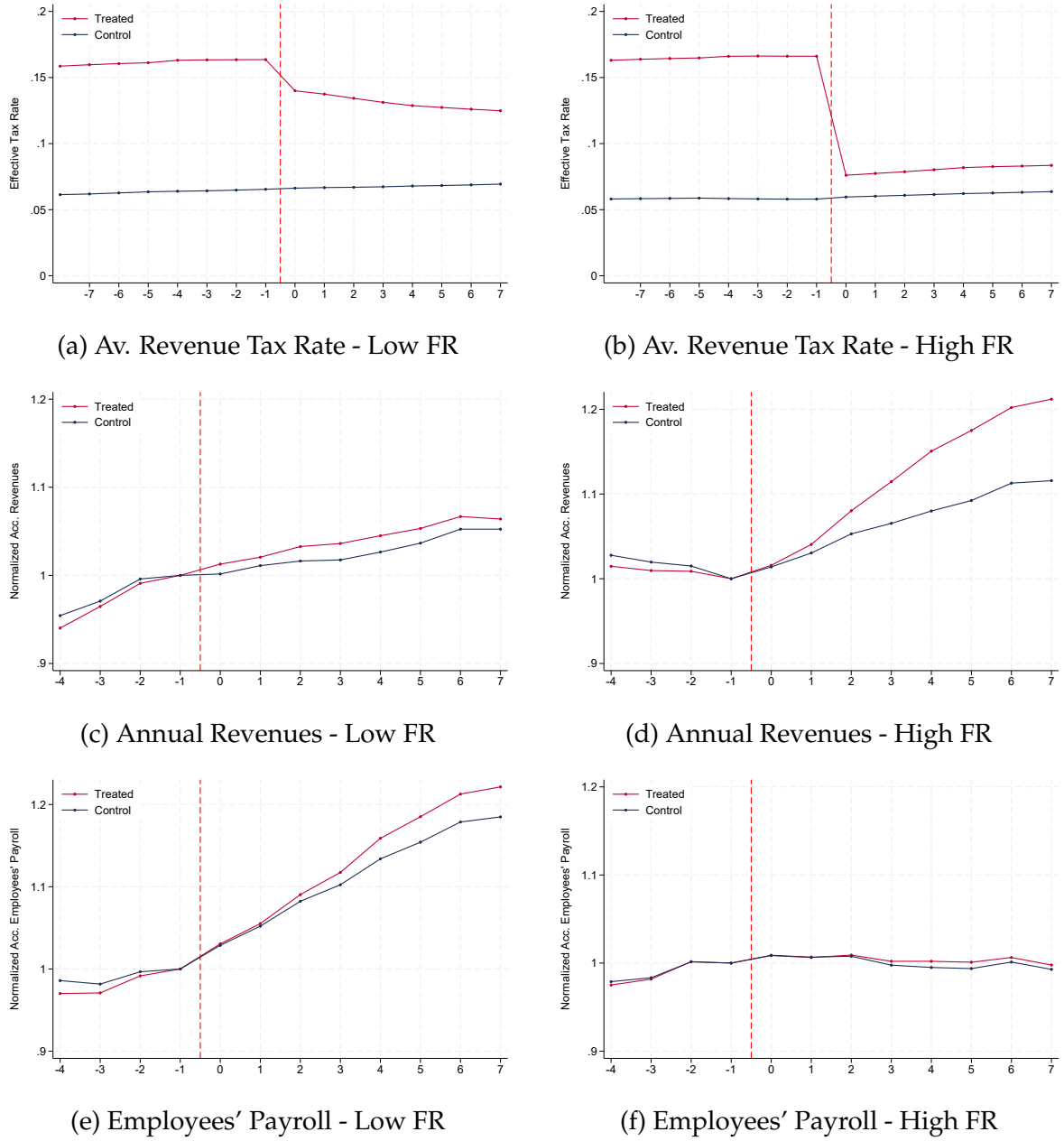
A.1 Figures

Figure A.1: Change in Effective Tax Rate including All Wage Taxes



Notes: This Figure plots the average tax rate (average revenue tax + INSS) across the Factor R distribution, for different revenue levels.

Figure A.2: Treatment vs. Control: Raw trends for incumbent firms



(a) Av. Revenue Tax Rate - Low FR

(b) Av. Revenue Tax Rate - High FR

(c) Annual Revenues - Low FR

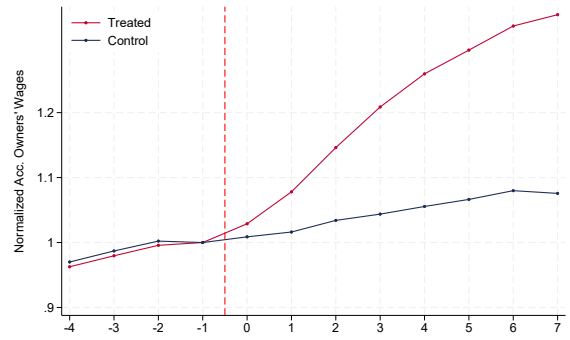
(d) Annual Revenues - High FR

(e) Employees' Payroll - Low FR

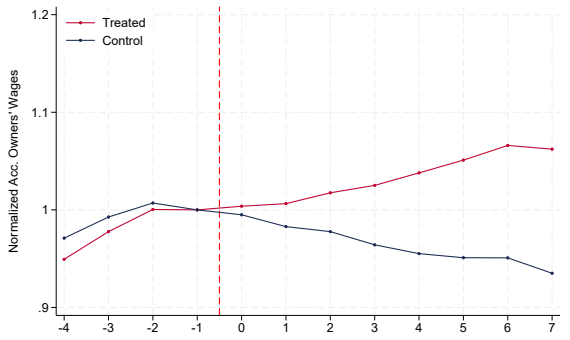
(f) Employees' Payroll - High FR

Notes: This Figure shows the raw trends comparing treated vs control incumbent firms. Panels on the left correspond to Low FR firms, while panels on the right correspond to High Factor R firms. Panel (a) and (b) plot the evolution of the average revenue tax rate. Panel (c) and (d) plot the evolution of the average revenues, normalized in the last quarter of 2017. Panel (e) and (f) plot the evolution of the average employees' payroll, normalized in the last quarter of 2017. The vertical dashed bar indicates the introduction of the reform. Revenues and employees' payroll were previously expressed in real terms.

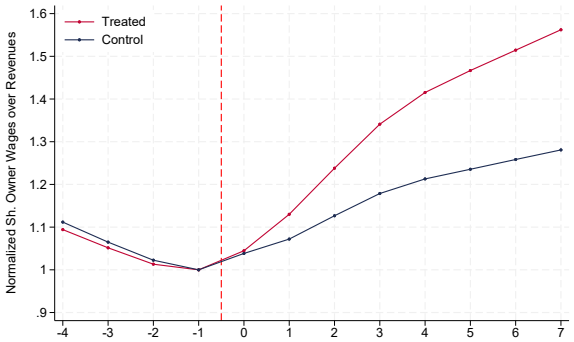
Figure A.3: Treatment vs. Control: Raw trends for incumbent firms (more outcomes)



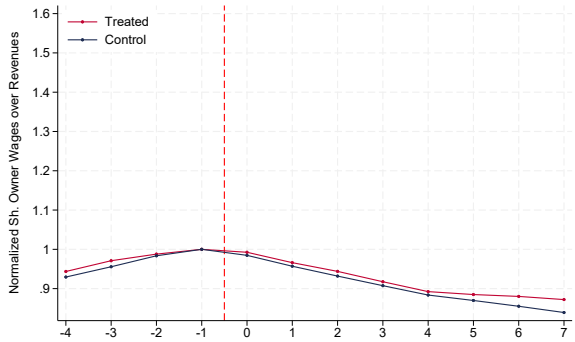
(a) Owner Wages - Low FR



(b) Owner Wages - High FR



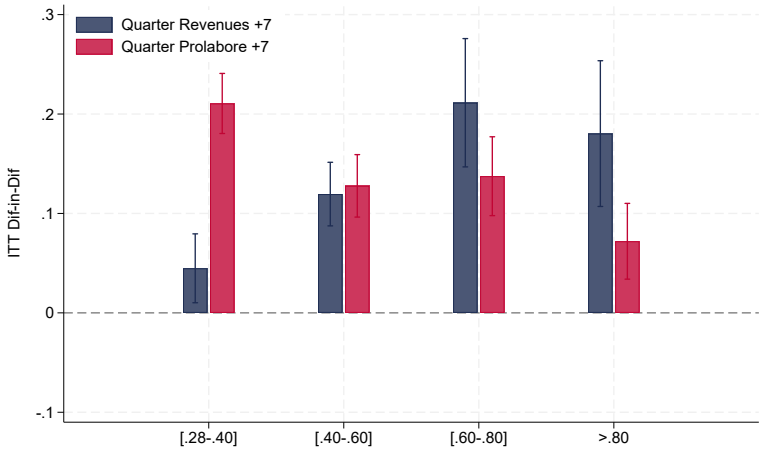
(c) Owner Wages / Revenues - Low FR



(d) Owner Wages / Revenues - High FR

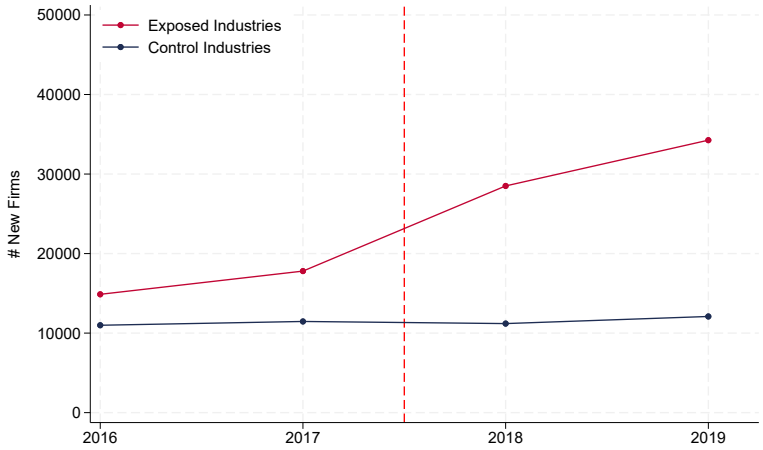
Notes: This Figure shows the raw trends comparing treated vs control incumbent firms. Panels on the left correspond to Low FR firms, while panels on the right correspond to High Factor R firms. Panel (a) and (b) plot the evolution of the average wages paid to the firm's owners, normalized in the last quarter of 2017. Panel (c) and (d) plot the evolution of the share of revenues used to pay owner wages, normalized in the last quarter of 2017. The vertical dashed bar indicates the introduction of the reform. Revenues and owner wages were previously expressed in real terms

Figure A.4: ITT for Incumbent Firms based on pre-policy Factor R

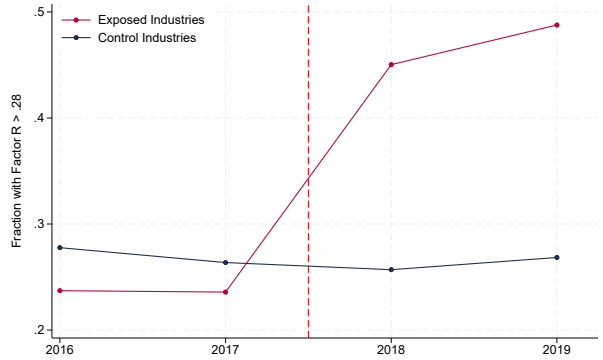


Notes: This Figure shows the β_7 from Equation 50 for different samples based on the pre-policy location in the Factor R distribution. Blue bars use real revenues as outcome, and red bars use owner wages. From left to right, the sample moves further away from the 28% threshold.

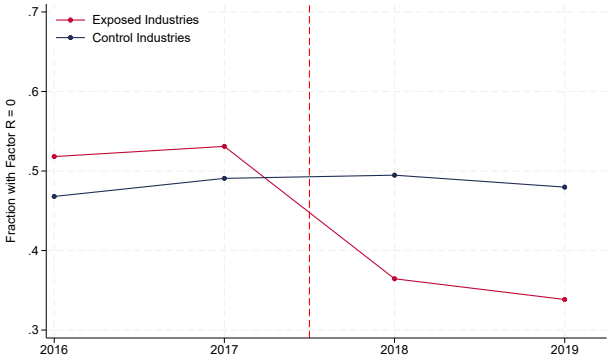
Figure A.5: Raw trends for new firms (exposed vs. non-exposed industries)



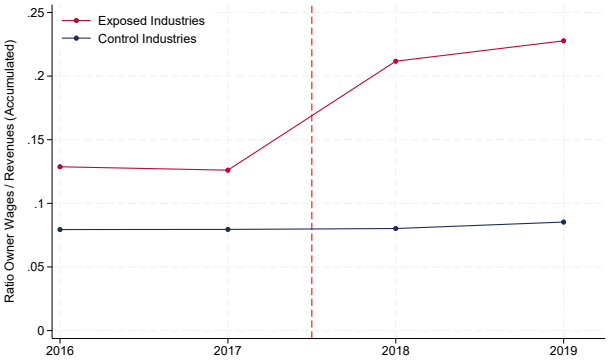
(a) Number of New Firms



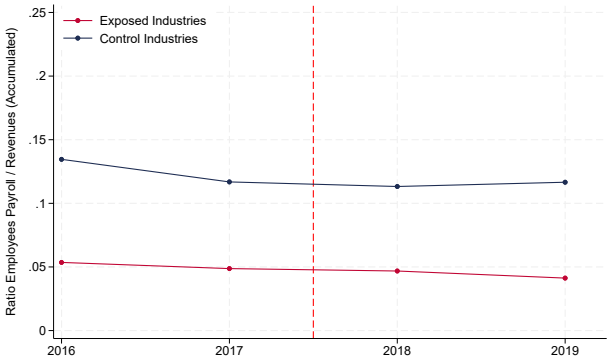
(b) Firms with FR ≥ 28%



(c) Firms with FR < 5%



(d) Avg. Ratio Owner Wages / Revenues



(e) Avg. Ratio Employees' Payroll / Revenues

Notes: This Figure shows the raw trends comparing treated vs control industries. The unit of observation is the industry-year, and it is constructed using information on new firms within each industry-year. Panels on the left correspond to Low FR firms, while panels on the right correspond to High Factor R firms. Panel (a) plots the evolution of the average number of new firms. The remaining plots show the evolution of the new firms' composition. Panel (b) plots the share of new firms that entered with a Factor R above 28%. Panel (c) plots the share of new firms that entered with a Factor R below 5%. Panel (d) and (e) decompose the Factor R by each component of the numerator: owner wages and employees' payroll, respectively. The vertical dashed bar indicates the introduction of the reform. Revenues, owner wages and employees' payroll were previously expressed in real terms. Averages across industries are weighted by each industry's relative size, defined as the number of new firms in the baseline year.

A.2 Tables

Table A.1: Broad economic activities by Anexo (Simples Nacional)

Control: Anexo IV	**Treated: Anexo VI**
Construction (incl. subcontracting) and interior/landscaping services	Health professionals (medical, dental, veterinary; psychology and related clinics)
Security, cleaning, and maintenance services	Regulated professional services (architecture/engineering; technical consulting and auditing)
Legal services (advocacy)	Other intellectual services (e.g. advertising/journalism; translation/interpreting; appraisals)

Notes: This table provides illustrative examples of activities classified under Anexo IV (control) and Anexo VI (treated) prior to the reform. Categories are based on LC 123/2006, art. 18, §5º-C and §5º-I, and are shown for exposition rather than as an exhaustive list.

Table A.2: Extensive-Margin: Stock of Firms

	(1) Subject to FR	(2) # Simples Nacional	(3) # Lucro Presumido	(4) # Total
Pre-period				
2016	-0.001	-141.914	14.671	-127.243
	(0.001)	(158.246)	(51.056)	(173.791)
Post-period				
2018	0.534***	466.549**	-207.034***	259.515
	(0.022)	(187.235)	(53.573)	(170.653)
2019	0.526***	839.358**	-303.281***	536.077
	(0.022)	(362.791)	(84.235)	(346.132)
Mean Dep. Var. Treated	0.014	1724.233	2512.628	4236.860
Mean Dep. Var. Control	0.001	2466.218	637.964	3104.182
FE by Year	✓	✓	✓	✓
FE by Industry	✓	✓	✓	✓
Observations	558	564	564	564

Notes: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table A.3: Extensive-Margin Difference-in-Differences Estimates

	(1) # New Firms	(2) Log New Firms	(3) Sh. Employees t-1	(4) Sh. Priv. Employees t-1	(5) Sh. Top 5% Employees t-1
Pre-period					
2016	-33.184**	-0.112	0.005	-0.011	0.020***
	(14.138)	(0.092)	(0.020)	(0.016)	(0.006)
Post-period					
2018	150.135***	0.379***	-0.001	-0.004	-0.005
	(36.131)	(0.078)	(0.008)	(0.011)	(0.006)
2019	206.167***	0.452***	0.001	0.003	-0.006
	(52.391)	(0.069)	(0.008)	(0.011)	(0.007)
Mean Dep. Var. Treated	237.29	4.15	0.47	0.32	0.16
Mean Dep. Var. Control	266.63	4.05	0.37	0.28	0.07
FE by Year	✓	✓	✓	✓	✓
FE by Industry	✓	✓	✓	✓	✓
Reweighted	X	X	✓	✓	✓
Observations	472	472	466	466	466

Notes: This table reports event-study difference-in-differences estimates of the Fator R reform on extensive-margin outcomes. Each column corresponds to a separate regression. Coefficients are interactions of year indicators with treatment exposure (`FR_act`), with 2016 as the omitted reference year. All specifications absorb year and industry (CNAE) fixed effects. Standard errors clustered at the industry level in parentheses. *Mean Dep. Var.* rows report the 2016 baseline mean of the dependent variable for treated and control groups. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Finally, Anexo IV covered firms in 5-C, which did not experience changes in activity coverage during the 2018 reform (the *revogado* occurred before the reform).

Table A.4: LC 123, art. 18, § 5º-C — Lista de atividades (PT)

Item	**Atividade**
I	construção de imóveis e obras de engenharia em geral, inclusive sob a forma de subempreitada, execução de projetos e serviços de paisagismo, bem como decoração de interiores
II	(REVOGADO)
III	(REVOGADO)
IV	(REVOGADO)
V	(REVOGADO)
VI	serviço de vigilância, limpeza ou conservação
VII	serviços advocatícios *(incluído pela LC 147/2014)*

Table A.5: Anexo VI tax rates: pre- vs post-reform (Factor R)

Pre-reform

Annual Revenues (R$)	**Tax Rate**
180,000	16.93%
180,000–360,000	17.72%
360,000–540,000	18.43%
540,000–720,000	18.77%
720,000–900,000	19.04%
900,000–1,080,000	19.94%
1,080,000–1,260,000	20.34%
1,260,000–1,440,000	20.66%
…	…
3,420,000–3,600,000	22.45%

Post-reform

Annual Revenues (R$)	**Tax Rate**	
	FR < .28	**FR ≥ .28**
180,000	15.50%	6.00%
180,000–360,000	18.00%	11.20%
360,000–720,000	19.50%	13.50%
720,000–1,800,000	20.50%	16.00%
1,800,000–3,600,000	23.00%	21.00%
3,600,000–4,800,000	30.50%	33.00%

How do Firms Behave in Simplified Tax Regimes?

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Online Appendix For Publication

B Conceptual Framework: General Results and Proofs

This appendix provides the formal derivations and proofs for the conceptual framework in Section 4. The analysis remains fully general with respect to the production technology and the functional forms governing input costs, revenue reporting, and owner compensation. A separate appendix specializes the framework to a particular production function and derives primitive conditions under which the assumptions imposed in the main text hold.

Throughout, we suppress the firm subscript i whenever this does not create ambiguity. Let

$$x = (e, L, \widetilde{R}, w^o)$$

denote the firm's vector of choices, let

$$R = R(e, L; A, \delta)$$

denote true revenue, and let

$$r(x) = \frac{wL + w^o}{\widetilde{R}}$$

denote Factor R. We restrict attention to operating allocations with $\widetilde{R} > 0$.

Conditional on schedule $j \in \{H, L\}$, the owner's payoff is

$$u_j(x; A, \delta) = R(e, L; A, \delta) - \mathcal{T}_j(\widetilde{R}) - wL - v(e) - \Phi(L) - c\big(R(e, L; A, \delta) - \widetilde{R}\big) - \Gamma(w^o). \quad (61)$$

The favorable schedule satisfies

$$\mathcal{T}_L(\widetilde{R}) < \mathcal{T}_H(\widetilde{R}) \qquad \text{for every } \widetilde{R} > 0 \quad (62)$$

over the relevant revenue support.

The maximized operating values introduced in the main text are

$$\Pi_H(A, \delta) = \max_x u_H(x; A, \delta), \quad (63)$$

$$\Pi_L(A, \delta) = \max_x u_L(x; A, \delta), \quad (64)$$

$$\Pi_T(A, \delta) = \max_{x: r(x) \geq T} u_L(x; A, \delta). \quad (65)$$

Let x^L denote an unconstrained low-tax optimum and let

$$r^N(A, \delta) = r(x^L)$$

be the corresponding natural Factor R.

Throughout, we maintain the regularity condition stated in the main text that the natural payroll shares are uniquely determined by the unconstrained low-tax problem. Formally, let

$$\mathcal{X}_L(A,\delta) \equiv \arg\max_x u_L(x;A,\delta).$$

For any $x, x' \in \mathcal{X}_L(A,\delta)$, we assume

$$\frac{wL(x)}{\widetilde{R}(x)} = \frac{wL(x')}{\widetilde{R}(x')} \qquad \text{and} \qquad \frac{w^o(x)}{\widetilde{R}(x)} = \frac{w^o(x')}{\widetilde{R}(x')}. \tag{66}$$

It follows immediately that all unconstrained low-tax optima also generate the same Factor R,

$$r(x) = r(x').$$

Hence $p^N(A,\delta)$, $\omega^N(A,\delta)$, and $r^N(A,\delta)$ are well defined even when the underlying allocation x^L is not unique. The condition does not require uniqueness of the firm's allocation and therefore does not rule out discrete changes in optimal hiring as (A,δ) varies.

When the high-tax problem has multiple optima, statements that a non-responder "retains" its pre-reform allocation should be interpreted using a fixed selection rule across policy states. None of the value comparisons below depends on this selection convention.

B.1 Operating values and the decomposition of the Factor R gain

We begin by establishing the value decomposition that links the intensive and extensive margins.

Define

$$B(A,\delta) \equiv \Pi_L(A,\delta) - \Pi_H(A,\delta), \tag{67}$$

$$C(A,\delta) \equiv \Pi_L(A,\delta) - \Pi_T(A,\delta). \tag{68}$$

The first object is the value of receiving the favorable schedule in the absence of the Factor R eligibility condition. The second is the loss in optimized payoff generated by imposing that eligibility condition while holding the favorable schedule fixed.

Lemma 1 (Basic properties of B and C). Suppose the maximization problems in (63)–(65) admit solutions and the high-tax optimum has strictly positive reported revenue. Then

$$B(A,\delta) > 0 \qquad \text{and} \qquad C(A,\delta) \geq 0. \tag{69}$$

Moreover, if $r^N(A,\delta) \geq T$, then

$$C(A,\delta) = 0.$$

Proof. Let x^H be an allocation attaining $\Pi_H(A,\delta)$. By schedule dominance,

$$u_L(x^H; A, \delta) > u_H(x^H; A, \delta) = \Pi_H(A,\delta),$$

where the strict inequality follows from $\widetilde{R}^H > 0$. Since Π_L is the maximum of u_L over the unrestricted choice set,

$$\Pi_L(A,\delta) \geq u_L(x^H; A, \delta) > \Pi_H(A,\delta).$$

Therefore,

$$B(A,\delta) = \Pi_L(A,\delta) - \Pi_H(A,\delta) > 0.$$

Next, the feasible set defining Π_T is a subset of the feasible set defining Π_L. Hence

$$\Pi_T(A,\delta) \leq \Pi_L(A,\delta),$$

which establishes $C(A,\delta) \geq 0$.

Finally, suppose $r^N(A,\delta) \geq T$. By (66), every unconstrained low-tax optimum generates this same Factor R. In particular, x^L is feasible for the constrained problem defining Π_T. Consequently,

$$\Pi_T(A,\delta) \geq u_L(x^L; A, \delta) = \Pi_L(A,\delta).$$

Together with $\Pi_T \leq \Pi_L$, this implies

$$\Pi_T(A,\delta) = \Pi_L(A,\delta),$$

and therefore $C(A,\delta) = 0$. □

This result formalizes the interpretation of C as the optimized cost of the Factor R restriction. If the firm's preferred low-tax allocation already satisfies the rule, imposing the rule removes no allocation the firm wishes to choose and therefore has zero opportunity cost.

Lemma 2 (Value generated by Factor R). The increase in maximized operating value generated by Factor R is

$$G(A,\delta) = [B(A,\delta) - C(A,\delta)]_+ . \tag{70}$$

Proof. After the reform, the high schedule is available only to allocations that do not satisfy

Factor R. Define the value of the best such allocation as

$$\Pi_{H,<T}(A,\delta) \equiv \sup_{x:\, r(x)<T} u_H(x;A,\delta). \tag{71}$$

The firm's actual post-reform operating value is therefore

$$\Pi^1(A,\delta) = \max\left\{\Pi_{H,<T}(A,\delta), \Pi_T(A,\delta)\right\}. \tag{72}$$

We first show that

$$\Pi^1(A,\delta) = \max\left\{\Pi_H(A,\delta), \Pi_T(A,\delta)\right\}. \tag{73}$$

Since the set $\{x : r(x) < T\}$ is a subset of the unrestricted choice set,

$$\Pi_{H,<T}(A,\delta) \le \Pi_H(A,\delta).$$

It follows that

$$\Pi^1(A,\delta) \le \max\{\Pi_H(A,\delta), \Pi_T(A,\delta)\}.$$

For the reverse inequality, let x^H be an allocation attaining $\Pi_H(A,\delta)$. There are two cases.

If

$$r(x^H) < T,$$

then x^H is feasible for the nonqualifying high-schedule problem, so

$$\Pi_{H,<T}(A,\delta) \ge u_H(x^H;A,\delta) = \Pi_H(A,\delta).$$

Since the opposite inequality already holds,

$$\Pi_{H,<T}(A,\delta) = \Pi_H(A,\delta),$$

and hence $\Pi^1 \ge \Pi_H$.

If instead

$$r(x^H) \ge T,$$

then x^H is feasible for the qualifying low-schedule problem defining Π_T. By schedule dominance,

$$u_L(x^H;A,\delta) > u_H(x^H;A,\delta) = \Pi_H(A,\delta).$$

Therefore

$$\Pi_T(A,\delta) \ge u_L(x^H;A,\delta) > \Pi_H(A,\delta),$$

and again $\Pi^1 \geq \Pi_H$.

Since $\Pi^1 \geq \Pi_T$ directly from (72), we have

$$\Pi^1(A,\delta) \geq \max\{\Pi_H(A,\delta), \Pi_T(A,\delta)\}.$$

Together with the opposite inequality established above, this proves (73).

The gain generated by Factor R relative to the pre-reform value Π_H is therefore

$$\begin{aligned} G(A,\delta) &= \Pi^1(A,\delta) - \Pi_H(A,\delta) \\ &= \max\{\Pi_H(A,\delta), \Pi_T(A,\delta)\} - \Pi_H(A,\delta) \\ &= \max\{0, \Pi_T(A,\delta) - \Pi_H(A,\delta)\}. \end{aligned}$$

Using the definitions of B and C,

$$\begin{aligned} \Pi_T - \Pi_H &= (\Pi_L - \Pi_H) - (\Pi_L - \Pi_T) \\ &= B - C. \end{aligned}$$

Hence

$$G(A,\delta) = [B(A,\delta) - C(A,\delta)]_+.$$

□

B.1.1 A formal interpretation of C as the cost of the eligibility restriction

The definition of C does not require differentiability. Under additional regularity, however, its interpretation can be made more explicit.

For an arbitrary eligibility threshold t, define

$$\Pi(t;A,\delta) \equiv \max_{x:\, wL+w^o-t\widetilde{R}\geq 0} u_L(x;A,\delta), \tag{74}$$

and

$$C(t;A,\delta) \equiv \Pi_L(A,\delta) - \Pi(t;A,\delta).$$

Thus $C(T;A,\delta) = C(A,\delta)$.

Suppose that over an interval of thresholds the constrained optimum is differentiable, the eligibility constraint binds, and the usual constraint qualification holds. Let $\lambda(t) \geq 0$ denote the multiplier on

$$wL + w^o - t\widetilde{R} \geq 0.$$

The Lagrangian is

$$\mathcal{L} = u_L(x; A, \delta) + \lambda\left(wL + w^o - t\widetilde{R}\right).$$

The envelope theorem gives

$$\frac{\partial \Pi(t; A, \delta)}{\partial t} = -\lambda(t)\widetilde{R}(t). \tag{75}$$

Therefore

$$\frac{\partial C(t; A, \delta)}{\partial t} = \lambda(t)\widetilde{R}(t) \geq 0. \tag{76}$$

When $r^N < T$ and the regularity conditions above hold along the entire path from r^N to T,

$$C(A, \delta) = \int_{r^N(A,\delta)}^{T} \lambda(t)\widetilde{R}(t)\, dt. \tag{77}$$

Equation (77) provides an alternative interpretation of C: it is the cumulative shadow cost of tightening the Factor R requirement from the firm's preferred low-tax ratio r^N to the statutory threshold T. This representation is not needed for any proposition in the main text, but makes clear why Π_L, rather than the pre-reform allocation, is the appropriate benchmark for measuring the cost of satisfying Factor R.

B.2 Labor bias and natural eligibility

We next derive the implications of Assumption 1. Recall the decomposition

$$p^N(A, \delta) = \frac{wL^L(A, \delta)}{\widetilde{R}^L(A, \delta)}, \tag{78}$$

$$\omega^N(A, \delta) = \frac{w^{o,L}(A, \delta)}{\widetilde{R}^L(A, \delta)}, \tag{79}$$

$$r^N(A, \delta) = p^N(A, \delta) + \omega^N(A, \delta). \tag{80}$$

Assumption 1 imposes, for $\delta_2 > \delta_1$,

$$p^N(A, \delta_2) - p^N(A, \delta_1) \geq 0, \tag{81}$$

together with

$$\omega^N(A, \delta_2) - \omega^N(A, \delta_1) \geq -\left[p^N(A, \delta_2) - p^N(A, \delta_1)\right]. \tag{82}$$

The first inequality gives δ its labor-bias interpretation. The second ensures that the endogenous change in the owner-wage share does not overturn the increase in employee-payroll intensity when determining total Factor R.

Lemma 3 (Natural Factor R is ordered by δ). Under Assumption 1, for every fixed A and every $\delta_2 > \delta_1$,

$$r^N(A, \delta_2) \geq r^N(A, \delta_1). \tag{83}$$

Whether the boundary type $\delta = \delta^N(A)$ itself belongs to $\mathcal{D}^N(A)$ is left unrestricted and is immaterial for the results.

Proof. Using (80),

$$\begin{aligned} r^N(A, \delta_2) - r^N(A, \delta_1) = &\left[p^N(A, \delta_2) - p^N(A, \delta_1)\right] \\ &+ \left[\omega^N(A, \delta_2) - \omega^N(A, \delta_1)\right]. \end{aligned}$$

By (82), the second term is bounded below by the negative of the first. Hence

$$r^N(A, \delta_2) - r^N(A, \delta_1) \geq 0.$$

□

Notice that strict monotonicity of p^N conditional on positive employment does not by itself imply strict monotonicity of r^N. The owner-wage share could decline by exactly the increase in employee-payroll intensity. The assumptions in the main text therefore deliver the weak ordering needed for the natural-eligibility result without imposing unnecessary restrictions on unconstrained owner compensation.

Lemma 4 (The natural-eligibility set is an upper set). For fixed A, define

$$\mathcal{D}^N(A) = \left\{\delta : r^N(A, \delta) \geq T\right\}. \tag{84}$$

Under Assumption 1, $\mathcal{D}^N(A)$ is an upper set: if

$$\delta_1 \in \mathcal{D}^N(A) \qquad \text{and} \qquad \delta_2 > \delta_1,$$

then

$$\delta_2 \in \mathcal{D}^N(A).$$

Proof. If $\delta_1 \in \mathcal{D}^N(A)$, then

$$r^N(A, \delta_1) \geq T.$$

By Lemma 3,

$$r^N(A, \delta_2) \geq r^N(A, \delta_1) \geq T$$

for every $\delta_2 > \delta_1$. Hence $\delta_2 \in \mathcal{D}^N(A)$. □

Whenever $\mathcal{D}^N(A)$ is nonempty, define

$$\delta^N(A) = \inf \mathcal{D}^N(A). \tag{85}$$

Since $\mathcal{D}^N(A)$ is an upper set,

$$\delta > \delta^N(A) \quad \Longrightarrow \quad r^N(A, \delta) \geq T. \tag{86}$$

Whether the boundary type $\delta = \delta^N(A)$ itself belongs to $\mathcal{D}^N(A)$ is left unrestricted and is immaterial for the results.

Natural eligibility does not require employee payroll alone to reach the threshold. The natural-eligibility condition is

$$r^N(A, \delta) = p^N(A, \delta) + \omega^N(A, \delta) \geq T.$$

Thus, it is entirely possible that

$$p^N(A, \delta) < T$$

while

$$r^N(A, \delta) \geq T$$

because the firm would optimally report positive owner wages even if Factor R did not condition access to the favorable tax schedule on doing so. By Lemma 1, such a firm still satisfies

$$C(A, \delta) = 0.$$

The relevant distinction is therefore whether owner compensation is part of the firm's unconstrained low-tax allocation, rather than whether owner wages are positive per se.

B.3 Manufactured eligibility

We now consider firms whose unconstrained low-tax allocation does not naturally qualify:

$$r^N(A, \delta) < T. \tag{87}$$

For these firms, access to the favorable schedule requires a departure from their unconstrained low-tax allocation.

The gain from doing so is positive if and only if

$$B(A, \delta) > C(A, \delta). \tag{88}$$

Since $B > 0$, define

$$Q(A, \delta) = \frac{C(A, \delta)}{B(A, \delta)}. \tag{89}$$

Then

$$G(A, \delta) > 0 \quad \Longleftrightarrow \quad Q(A, \delta) < 1. \tag{90}$$

B.3.1 Scale single crossing

Fix δ and consider an interval

$$\mathcal{I}_\delta \subseteq \left\{A : r^N(A, \delta) < T\right\}$$

of productivity levels over which firms do not naturally qualify. Assumption 2 requires $Q(A, \delta)$ to be continuous and strictly increasing in A on $\mathcal{I}_\delta$, and to attain values both below and above one.

The restriction is imposed only within an interval of non-natural eligibility because no monotonicity of $r^N(A, \delta)$ in productivity is required by the general framework. Consequently, the set

$$\{A : r^N(A, \delta) < T\}$$

need not be a single interval. The proposition applies separately to each interval on which the maintained single-crossing condition holds.

Lemma 5 (Unique manufactured-eligibility cutoff). Under Assumption 2, there exists a unique

$$\overline{A}^M(\delta) \in \mathcal{I}_\delta$$

such that

$$Q(\overline{A}^M(\delta), \delta) = 1. \tag{91}$$

Moreover, within $\mathcal{I}_\delta$,

$$A < \overline{A}^M(\delta) \quad \Longrightarrow \quad Q(A, \delta) < 1, \tag{92}$$

$$A > \overline{A}^M(\delta) \quad \Longrightarrow \quad Q(A, \delta) > 1. \tag{93}$$

Proof. By assumption, there exist $A_a, A_b \in \mathcal{I}_\delta$ such that

$$Q(A_a, \delta) < 1 \qquad \text{and} \qquad Q(A_b, \delta) > 1.$$

Strict monotonicity implies $A_a < A_b$. Since $\mathcal{I}_\delta$ is an interval and Q is continuous, the inter-

mediate value theorem implies that there exists

$$\overline{A}^M(\delta) \in (A_a, A_b)$$

such that

$$Q(\overline{A}^M(\delta), \delta) = 1.$$

Strict monotonicity guarantees uniqueness.

Finally, strict monotonicity implies

$$A < \overline{A}^M(\delta) \quad \Rightarrow \quad Q(A, \delta) < Q(\overline{A}^M(\delta), \delta) = 1,$$

and analogously

$$A > \overline{A}^M(\delta) \quad \Rightarrow \quad Q(A, \delta) > 1.$$

□

B.3.2 Elasticity interpretation of the scale single-crossing condition

Assumption 2 is a reduced-form restriction on the optimized objects B and C. Its economic content can be made explicit when these objects are differentiable and strictly positive.

For $A > 0$,

$$\begin{aligned} \frac{\partial \log Q(A,\delta)}{\partial \log A} &= \frac{\partial \log C(A,\delta)}{\partial \log A} - \frac{\partial \log B(A,\delta)}{\partial \log A} \\ &= \varepsilon_{C,A} - \varepsilon_{B,A}. \end{aligned} \tag{94}$$

Therefore, a sufficient differential condition for Q to be strictly increasing throughout an interval is

$$\varepsilon_{C,A} > \varepsilon_{B,A} \qquad \text{throughout that interval.} \tag{95}$$

Equation (95) is the precise meaning of the scale single-crossing restriction: among firms that do not naturally qualify, the optimized cost of satisfying Factor R must grow with productivity faster than the value of receiving the favorable tax schedule.

The condition depends jointly on the production technology, the revenue-reporting problem, employee costs, and the owner-compensation cost Γ. Convexity of Γ can be an important force making C rise rapidly with scale, but it is not sufficient by itself. For example, if

$$T - r^N(A, \delta)$$

shrinks sufficiently rapidly with A, the amount of behavioral adjustment required to qualify may fall even as the firm becomes larger. Similarly, the firm may substitute toward some alternative eligibility margin whose cost grows slowly with scale. Because C is defined after optimizing over all available adjustment margins, the scale behavior of the full constrained problem is the relevant object.

A separate appendix derives (95) from primitives under the specific production technology used for the parametric application.

B.3.3 Envelope representation of the scale derivatives

Without choosing a particular production function, one can nevertheless show how the primitives enter B_A and C_A.

Suppose that A enters payoff only through true revenue

$$R(e, L; A, \delta),$$

that the relevant optima lie on differentiable branches, and that the envelope theorem applies. Define

$$z_j = R_j - \widetilde{R}_j$$

for $j \in \{H, L, T\}$. For an unconstrained optimum under schedule j,

$$\frac{\partial \Pi_j}{\partial A} = [1 - c'(z_j)]\, R_A(e_j, L_j; A, \delta). \tag{96}$$

The same expression applies to Π_T because the Factor R constraint has no direct dependence on A; its multiplier affects the constrained choices but not the direct envelope derivative with respect to A.

Define

$$M_j(A, \delta) \equiv [1 - c'(z_j)]\, R_A(e_j, L_j; A, \delta).$$

Then

$$B_A = M_L - M_H, \tag{97}$$

$$C_A = M_L - M_T. \tag{98}$$

These expressions make clear why the scale single-crossing condition is not a restriction on Γ alone. Although Γ does not enter the direct envelope derivative with respect to A, it changes the constrained allocation $(e_T, L_T, \widetilde{R}_T, w_T^o)$ and therefore affects M_T and C_A indirectly. The same is true of labor costs and reporting costs. The parametric appendix will make these channels explicit.

B.4 Proof of Proposition 1: natural and manufactured eligibility

We can now prove the proposition characterizing which firms gain from Factor R.

Proof of Proposition 1. **Part 1: Natural eligibility.**

Suppose

$$r^N(A_i, \delta_i) \geq T.$$

By Lemma 1, the unconstrained low-tax optimum is feasible under the Factor R eligibility condition, and hence

$$\Pi_T(A_i, \delta_i) = \Pi_L(A_i, \delta_i).$$

Therefore

$$C(A_i, \delta_i) = 0.$$

Since $B(A_i, \delta_i) > 0$, Lemma 2 gives

$$G(A_i, \delta_i) = [B(A_i, \delta_i) - 0]_+ = B(A_i, \delta_i) > 0.$$

Under Assumption 1, Lemmas 3 and 4 establish that natural eligibility is weakly ordered by δ. Hence, for fixed A, all types strictly above $\delta^N(A)$ naturally satisfy Factor R.

$$\delta_i > \delta^N(A_i) \quad \Longrightarrow \quad r^N(A_i, \delta_i) \geq T.$$

l **Part 2: Manufactured eligibility.**

Fix δ and an interval $\mathcal{I}_\delta$ over which

$$r^N(A, \delta) < T$$

and Assumption 2 holds.

By Lemma 5, there exists a unique $\overline{A}^M(\delta)$ such that

$$Q(\overline{A}^M(\delta), \delta) = 1.$$

For

$$A < \overline{A}^M(\delta),$$

strict monotonicity implies

$$Q(A, \delta) < 1.$$

Since $B(A, \delta) > 0$,

$$\frac{C(A, \delta)}{B(A, \delta)} < 1 \quad \Longleftrightarrow \quad C(A, \delta) < B(A, \delta).$$

By Lemma 2,

$$G(A,\delta) = B(A,\delta) - C(A,\delta) > 0.$$

Thus the firm finds it profitable to depart from its unconstrained low-tax allocation in order to satisfy Factor R.

For

$$A > \overline{A}^{M}(\delta),$$

we instead have

$$Q(A,\delta) > 1,$$

and therefore

$$C(A,\delta) > B(A,\delta).$$

Lemma 2 then gives

$$G(A,\delta) = 0.$$

The firm therefore prefers the high schedule to the best qualifying low-tax allocation.

At

$$A = \overline{A}^{M}(\delta),$$

we have

$$B(A,\delta) = C(A,\delta),$$

so

$$\Pi_T(A,\delta) = \Pi_H(A,\delta).$$

The firm is indifferent between qualifying for the favorable schedule and remaining under the high schedule.

All comparisons are conditional on A belonging to the non-natural-eligibility interval $\mathcal{I}_\delta$. The result therefore does not imply that sufficiently high-A firms necessarily remain under the high schedule; outside $\mathcal{I}_\delta$, they may instead qualify naturally. □

B.5 Incumbent firms and location around the threshold

We now prove the location results for firms already operating in Simples.

Define the optimized low-tax payoff conditional on Factor R:

$$W_L(r;A,\delta) = \max_{x:\, r(x)=r} u_L(x;A,\delta). \tag{99}$$

Assumption 3 states that W_L is continuous and strictly single-peaked at r^N.

The constrained low-tax problem can therefore be written as

$$\Pi_T(A,\delta) = \max_{r \geq T} W_L(r; A, \delta). \tag{100}$$

Lemma 6 (Solution to the qualifying low-tax problem). Under Assumption 3,

$$\arg\max_{r \geq T} W_L(r; A, \delta) = \begin{cases} r^N(A,\delta), & r^N(A,\delta) \geq T, \\ T, & r^N(A,\delta) < T. \end{cases} \tag{101}$$

Consequently,

$$\Pi_T(A,\delta) = \begin{cases} \Pi_L(A,\delta), & r^N(A,\delta) \geq T, \\ W_L(T; A, \delta), & r^N(A,\delta) < T. \end{cases} \tag{102}$$

Proof. If $r^N \geq T$, the unconstrained maximizer of $W_L(r)$ lies in the constrained set $[T, \infty)$. Hence it remains the maximizer after imposing the constraint.

If $r^N < T$, every feasible $r \geq T$ lies strictly to the right of the unique peak r^N. Strict single-peakedness implies that $W_L(r)$ is strictly decreasing for $r > r^N$. Therefore, among all $r \geq T$, the unique maximizer is the smallest feasible value,

$$r = T.$$

The corresponding value statements follow immediately. □

This lemma is the precise role of single-peakedness. Existence of a global low-tax optimum alone would not be sufficient: without the monotonic decline of W_L to the right of r^N, the qualifying region could contain a second local peak above T, in which case a constrained firm need not bunch at the statutory threshold.

B.6 Proof of Proposition 2

Let x^0 denote the firm's selected pre-reform optimum under the high schedule and let

$$r^0 = r(x^0).$$

Since the pre-reform problem is precisely the high-schedule problem,

$$u_H(x^0; A, \delta) = \Pi_H(A, \delta). \tag{103}$$

Proof of Proposition 2. **Part 1: Firms initially above the threshold.**

Suppose

$$r^0 \geq T.$$

The pre-reform allocation x^0 is therefore feasible for the post-reform qualifying problem. Moreover, because it now receives the favorable schedule,

$$u_L(x^0; A, \delta) > u_H(x^0; A, \delta) = \Pi_H(A, \delta),$$

where strict schedule dominance follows from positive reported revenue.

Since Π_T is the maximum over all qualifying allocations,

$$\Pi_T(A, \delta) \geq u_L(x^0; A, \delta) > \Pi_H(A, \delta).$$

Hence the firm's post-reform optimum cannot lie below T: any allocation with $r < T$ receives the high schedule and can generate at most Π_H, whereas some qualifying allocation generates strictly more. Therefore

$$r^1 \geq T.$$

We now distinguish the location of the unconstrained low-tax optimum.

If

$$r^N \geq T,$$

Lemma 6 implies

$$\Pi_T = \Pi_L$$

and the optimal qualifying Factor R is

$$r^1 = r^N.$$

If instead

$$r^N < T,$$

Lemma 6 implies that the best qualifying allocation lies exactly at

$$r = T.$$

Since (B.6) establishes that qualifying strictly dominates remaining under the high schedule, the post-reform optimum is

$$r^1 = T.$$

This proves all statements for firms initially above the threshold.

Part 2: Firms initially below the threshold.

Suppose

$$r^0 < T.$$

First consider

$$r^N \geq T.$$

The unconstrained low-tax optimum is feasible under the eligibility requirement, so

$$\Pi_T = \Pi_L.$$

By Lemma 1,

$$\Pi_L > \Pi_H.$$

Thus qualifying strictly dominates remaining below the threshold, and the firm chooses its unconstrained low-tax allocation:

$$r^1 = r^N \geq T.$$

Now consider

$$r^N < T.$$

By Lemma 6, the best qualifying allocation has

$$r = T$$

and value

$$\Pi_T = W_L(T).$$

The firm compares this value with

$$\Pi_H,$$

the maximum attainable while remaining under the high schedule.

If

$$\Pi_T > \Pi_H,$$

the firm strictly prefers to qualify. Since the unique best qualifying Factor R is T,

$$r^1 = T.$$

If instead

$$\Pi_T < \Pi_H,$$

the firm strictly prefers not to qualify. The high-schedule problem is unchanged by the

reform for allocations satisfying $r < T$. Hence the selected pre-reform optimum x^0 remains optimal and the firm stays below the threshold.

Finally, if

$$\Pi_T = \Pi_H,$$

the firm is indifferent between its best nonqualifying allocation and bunching at T.

This proves the proposition. □

B.6.1 Why no downward crossing does not require a local argument

It is useful to emphasize that the no-downward-crossing result for initially above-threshold firms does not rely on the firm being close to T, nor on a claim that the discrete tax gain "locally" exceeds the cost of crossing the threshold.

The argument is global. An initially above-threshold firm can retain its entire pre-reform allocation and, after the reform, receive the favorable schedule at that same allocation. Thus there exists a qualifying allocation whose payoff strictly exceeds the maximum payoff attainable under the high schedule. This alone rules out a post-reform optimum below T. Single-peakedness is required only to determine whether the firm's best qualifying allocation is its unconstrained low-tax optimum or the boundary T.

B.7 Adjustment identity for threshold bunchers

Let

$$P = wL + w^o.$$

Suppose a firm locates exactly at the Factor R threshold after the reform:

$$P^1 = T\widetilde{R}^1.$$

Before the reform,

$$P^0 = r^0\widetilde{R}^0.$$

Subtracting P^0 from P^1 gives

$$\begin{aligned}\Delta P &= T\widetilde{R}^1 - r^0\widetilde{R}^0 \\ &= T(\widetilde{R}^1 - \widetilde{R}^0) + (T - r^0)\widetilde{R}^0.\end{aligned}$$

Therefore,

$$\Delta P - T\Delta\widetilde{R} = (T - r^0)\widetilde{R}^0. \tag{104}$$

Using

$$\Delta P = w\Delta L + \Delta w^o$$

when w is held fixed,

$$w\Delta L + \Delta w^o - T\Delta\widetilde{R} = (T - r^0)\widetilde{R}^0. \tag{105}$$

For a buncher coming from below,

$$r^0 < T,$$

so

$$w\Delta L + \Delta w^o - T\Delta\widetilde{R} > 0. \tag{106}$$

The initial distance from the threshold must therefore be closed through some combination of higher employee payroll, higher owner wages, or lower reported revenue.

For a buncher coming from above,

$$r^0 > T,$$

the right-hand side is negative. Such a firm reduces Factor R relative to its initial allocation but is prevented by the eligibility condition from moving below T.

Equation (105) is an accounting identity. It does not determine which margin responds. The choice among these margins is governed by the underlying production, reporting, and compensation costs contained in the optimization problem.

B.8 Selection into Simples

We next embed the operating problem into the regime-choice decision. By Lemma 2, the post-reform operating value inside Simples is $\max\{\Pi_H(A,\delta), \Pi_T(A,\delta)\}$, even though the high schedule itself is available only for allocations satisfying $r < T$.

Let K_S denote the fixed cost of operating under Simples. Before the reform, Before the reform,

$$V_S^0(A,\delta) = \Pi_H(A,\delta) - K_S. \tag{107}$$

By Lemma 2, after the reform,

$$\begin{aligned} V_S^1(A,\delta) &= \max\{\Pi_H(A,\delta), \Pi_T(A,\delta)\} - K_S \\ &= V_S^0(A,\delta) + G(A,\delta). \end{aligned} \tag{108}$$

The second equality follows directly from the definition of G.

Equation (**??**) establishes formally that the intensive and extensive margins are gov-

erned by the same object. Factor R raises the value of selecting into Simples by exactly the increase in operating value available to a firm already inside the regime.

B.9 Pre-reform productivity sorting

Let $V_P(A, \delta)$ denote the value of Lucro Presumido and normalize the outside option to zero. Define

$$D^0(A, \delta) = V_P(A, \delta) - V_S^0(A, \delta). \tag{109}$$

Under Assumption 4, for fixed δ:

1. $V_S^0(A, \delta)$ is strictly increasing in A and crosses zero once at $A_E^0(\delta)$;
2. $D^0(A, \delta)$ is strictly increasing in A and crosses zero once at $A_{SP}^0(\delta)$;
3. $$A_E^0(\delta) < A_{SP}^0(\delta).$$

Lemma 7 (Pre-reform regime allocation). Under Assumption 4, apart from exact indifference points,

$$j^0(A, \delta) = \begin{cases} 0, & A < A_E^0(\delta), \\ S, & A_E^0(\delta) < A < A_{SP}^0(\delta), \\ P, & A > A_{SP}^0(\delta). \end{cases} \tag{110}$$

Proof. Fix δ.

If

$$A < A_E^0(\delta),$$

strict monotonicity and the unique zero of V_S^0 imply

$$V_S^0(A, \delta) < 0.$$

Moreover,

$$A < A_E^0(\delta) < A_{SP}^0(\delta),$$

so the unique-crossing property of D^0 implies

$$D^0(A, \delta) < 0.$$

Hence

$$V_P(A, \delta) < V_S^0(A, \delta) < 0.$$

The outside option, normalized to zero, strictly dominates both formal regimes.

If

$$A_E^0(\delta) < A < A_{SP}^0(\delta),$$

then

$$V_S^0(A, \delta) > 0$$

and

$$D^0(A, \delta) < 0.$$

Thus

$$V_P(A, \delta) < V_S^0(A, \delta),$$

while $V_S^0 > 0$, so Simples strictly dominates both Lucro Presumido and the outside option.

Finally, if

$$A > A_{SP}^0(\delta),$$

then

$$D^0(A, \delta) > 0,$$

so

$$V_P(A, \delta) > V_S^0(A, \delta).$$

Because

$$A > A_{SP}^0(\delta) > A_E^0(\delta),$$

we also have

$$V_S^0(A, \delta) > 0.$$

Therefore

$$V_P(A, \delta) > V_S^0(A, \delta) > 0,$$

and Lucro Presumido strictly dominates both alternatives. □

B.10 Proof of Proposition 3

A firm is induced into Simples if its post-reform choice is S but its pre-reform choice is either the outside option or Lucro Presumido.

Proof of Proposition 3. Fix δ.

Suppose an induced firm's pre-reform counterfactual is the outside option. By Lemma 7, the outside option is the unique pre-reform choice only for

$$A < A_E^0(\delta).$$

Therefore any induced firm coming from the outside option satisfies

$$A_i < A_E^0(\delta).$$

Now suppose an induced firm's pre-reform counterfactual is Lucro Presumido. Again by Lemma 7, Lucro Presumido is the unique pre-reform choice only for

$$A > A_{SP}^0(\delta).$$

Therefore any induced firm coming from Lucro Presumido satisfies

$$A_i > A_{SP}^0(\delta).$$

Since Assumption 4 imposes

$$A_E^0(\delta) < A_{SP}^0(\delta),$$

we obtain, for any outside-option switcher i and Lucro-Presumido switcher k with the same δ,

$$A_i < A_E^0(\delta) < A_{SP}^0(\delta) < A_k.$$

Hence every induced firm coming from Lucro Presumido has strictly higher productivity than every induced firm coming from the outside option, conditional on δ. □

B.11 Movement of the regime boundaries

The counterfactual proposition requires only pre-reform sorting. To represent the reform as movements in regime boundaries, additional post-reform single-crossing conditions are required.

Define the post-reform Simples–outside difference as

$$F_E^1(A, \delta) \equiv V_S^1(A, \delta),$$

and the post-reform Lucro-Presumido–Simples difference as

$$\begin{aligned} D^1(A, \delta) &\equiv V_P(A, \delta) - V_S^1(A, \delta) \\ &= D^0(A, \delta) - G(A, \delta). \end{aligned} \tag{111}$$

Suppose locally that $V_S^1(A, \delta)$ remains continuous and strictly increasing and has a

unique zero $A_E^1(\delta)$. At the old entry threshold,

$$\begin{aligned} V_S^1(A_E^0, \delta) &= V_S^0(A_E^0, \delta) + G(A_E^0, \delta) \\ &= G(A_E^0, \delta). \end{aligned} \tag{112}$$

Therefore, if

$$G(A_E^0(\delta), \delta) > 0,$$

then

$$V_S^1(A_E^0, \delta) > 0.$$

Since V_S^1 is strictly increasing and equals zero at A_E^1, it follows that

$$A_E^1(\delta) < A_E^0(\delta). \tag{113}$$

Similarly, suppose $D^1(A, \delta)$ remains continuous and strictly increasing and has a unique zero $A_{SP}^1(\delta)$. At the old Simples–Presumido boundary,

$$\begin{aligned} D^1(A_{SP}^0, \delta) &= D^0(A_{SP}^0, \delta) - G(A_{SP}^0, \delta) \\ &= -G(A_{SP}^0, \delta). \end{aligned} \tag{114}$$

Hence, if

$$G(A_{SP}^0(\delta), \delta) > 0,$$

then

$$D^1(A_{SP}^0, \delta) < 0.$$

Because D^1 is strictly increasing and crosses zero at A_{SP}^1,

$$A_{SP}^1(\delta) > A_{SP}^0(\delta). \tag{115}$$

These results explain why post-reform boundary movements require an additional local single-crossing condition. The fact that Factor R raises the value of Simples at the old boundary determines the direction in which a surviving unique boundary must move, but does not by itself guarantee that the post-reform value functions continue to cross only once.

B.12 Overlap between manufactured eligibility and Lucro Presumido displacement

Propositions 1 and 3 characterize different dimensions of heterogeneity. The first describes why Factor R is valuable; the second describes the firm's pre-reform counterfactual.

Consider the old Simples–Lucro Presumido boundary,

$$A = A^0_{SP}(\delta).$$

For a firm at this boundary to be attracted to Simples specifically through *manufactured* eligibility, two conditions are required.

First, the firm must not naturally qualify:

$$r^N(A^0_{SP}(\delta), \delta) < T. \tag{116}$$

Second, manufacturing eligibility must be profitable:

$$B(A^0_{SP}(\delta), \delta) > C(A^0_{SP}(\delta), \delta), \tag{117}$$

or equivalently

$$Q(A^0_{SP}(\delta), \delta) < 1. \tag{118}$$

Within an interval satisfying Assumption 2, Lemma 5 implies

$$Q(A, \delta) < 1 \quad \Longleftrightarrow \quad A < \overline{A}^M(\delta).$$

Thus the overlap condition can equivalently be written as

$$A^0_{SP}(\delta) < \overline{A}^M(\delta), \tag{119}$$

provided the old Simples–Presumido boundary lies inside the relevant non-natural-eligibility interval.

This condition resolves the apparent tension between the two comparative statics. Manufactured eligibility is relatively more attractive at lower A within the non-natural region, while firms whose counterfactual is Lucro Presumido are relatively high-A. Both can be true if the manufactured-eligibility region extends sufficiently far in productivity to overlap the upper boundary of the pre-reform Simples region.

B.13 Role of the assumptions

For completeness, it is useful to summarize exactly where the assumptions in the main text enter the results.

Schedule dominance. The condition

$$\mathcal{T}_L(\widetilde{R}) < \mathcal{T}_H(\widetilde{R})$$

establishes $B > 0$. It is also sufficient, together with the fact that an initially above-threshold allocation remains feasible, to rule out downward crossing by initially eligible incumbents.

Labor-bias ordering. Assumption 1 has two conceptually separate components. The first requires higher δ to weakly increase natural employee-payroll intensity. This is the production-side comparative static associated with labor bias. The second requires changes in unconstrained owner compensation not to offset that increase sufficiently to make total natural Factor R fall. Together they imply that natural eligibility is weakly ordered by δ.

The general proofs do not derive these conditions from a particular production technology. The parametric appendix does so separately.

Scale single crossing. Assumption 2 requires

$$Q(A, \delta) = \frac{C(A, \delta)}{B(A, \delta)}$$

to rise with A within an interval of firms that do not naturally qualify. Under differentiability, the corresponding local condition is

$$\varepsilon_{C,A} > \varepsilon_{B,A}.$$

This is a restriction on the entire optimized problem. Convex owner-compensation costs can contribute to it, but convexity of Γ alone is not sufficient because production, reporting, natural Factor R, and alternative eligibility margins all affect C and B.

Single-peakedness in Factor R. Assumption 3 is used to determine the location of a constrained qualifying incumbent. If

$$r^N < T,$$

strict single-peakedness implies that $W_L(r)$ falls monotonically as r moves above r^N, and hence that the best feasible qualifying allocation lies exactly at

$$r = T.$$

It is not needed to establish the value decomposition $G = [B - C]_+$ or the no-downward-crossing result.

Productivity sorting. Assumption 4 orders the three pre-reform alternatives as

$$0 \longrightarrow S \longrightarrow P$$

as productivity rises, conditional on δ. Proposition 3 then follows directly from this pre-reform allocation. No assumption about the shape of $G(A, \delta)$ is required to establish the ranking of the counterfactual types.

Additional post-reform single-crossing conditions are required only if one wishes to represent the reform as movements in unique regime boundaries.

C Additional Tables

Table C.7: Anexo I: Commerce

	Receita Bruta em 12 Meses (em R$)	**Alíquota**	**Valor a Deduzir (em R$)**
1ª Faixa	Até 180.000,00	4,00%	-
2ª Faixa	De 180.000,01 a 360.000,00	7,30%	5.940,00
3ª Faixa	De 360.000,01 a 720.000,00	9,50%	13.860,00
4ª Faixa	De 720.000,01 a 1.800.000,00	10,70%	22.500,00
5ª Faixa	De 1.800.000,01 a 3.600.000,00	14,30%	87.300,00
6ª Faixa	De 3.600.000,01 a 4.800.000,00	19,00%	378.000,00

Table C.6: Simplified summary of the 2018 Simples Nacional reform

Pre-Reform (Old) Anexo	**Post-Reform Outcome**
Anexo I	Largely unchanged; only very small adjustments in the tax schedule.
Anexo II	Largely unchanged; only very small adjustments in the tax schedule.
Anexo III	Following the reform, activities previously classified under Old Anexo III are split into two groups. Activities classified as *not subject to the Fator R* remain in New Anexo III. Activities classified as *subject to the Fator R* remain in New Anexo III only if their payroll-to-revenue ratio exceeds the Fator R threshold; otherwise, they are reclassified into New Anexo V.
Anexo IV	Largely unchanged; only very small adjustments in the tax schedule.
Anexo V	Following the reform, activities previously classified under Old Anexo V are also split into two groups. Activities classified as *subject to the Fator R* migrate to New Anexo III if their payroll-to-revenue ratio exceeds the Fator R threshold; otherwise, they remain in New Anexo V. In addition, some activities are reclassified by statutory listing and may move directly to New Anexo III or New Anexo IV, independently of the Fator R.
Anexo VI	Firms are mechanically reassigned to New Anexo III or V based on the Fator R following the extinction of New Anexo VI.

Table C.8: Anexo II: Manufacturing

	Receita Bruta em 12 Meses (em R$)	**Alíquota**	**Valor a Deduzir (em R$)**
1ª Faixa	Até 180.000,00	4,50%	-
2ª Faixa	De 180.000,01 a 360.000,00	7,80%	5.940,00
3ª Faixa	De 360.000,01 a 720.000,00	10,00%	13.860,00
4ª Faixa	De 720.000,01 a 1.800.000,00	11,20%	22.500,00
5ª Faixa	De 1.800.000,01 a 3.600.000,00	14,70%	85.500,00
6ª Faixa	De 3.600.000,01 a 4.800.000,00	30,00%	720.000,00

Table C.9: Anexo III: serviços não relacionados no 5o-C do art. 18 desta Lei Complementar

	Receita Bruta em 12 Meses (em R$)	**Alíquota**	**Valor a Deduzir (em R$)**
1ª Faixa	Até 180.000,00	6,00%	–
2ª Faixa	De 180.000,01 a 360.000,00	11,20%	9.360,00
3ª Faixa	De 360.000,01 a 720.000,00	13,50%	17.640,00
4ª Faixa	De 720.000,01 a 1.800.000,00	16,00%	35.640,00
5ª Faixa	De 1.800.000,01 a 3.600.000,00	21,00%	125.640,00
6ª Faixa	De 3.600.000,01 a 4.800.000,00	33,00%	648.000,00

Table C.10: Anexo IV: serviços relacionados no 5o-C do art. 18 desta Lei Complementar

	Receita Bruta em 12 Meses (em R$)	**Alíquota**	**Valor a Deduzir (em R$)**
1ª Faixa	Até 180.000,00	4,50%	–
2ª Faixa	De 180.000,01 a 360.000,00	9,00%	8.100,00
3ª Faixa	De 360.000,01 a 720.000,00	10,20%	12.420,00
4ª Faixa	De 720.000,01 a 1.800.000,00	14,00%	39.780,00
5ª Faixa	De 1.800.000,01 a 3.600.000,00	22,00%	183.780,00
6ª Faixa	De 3.600.000,01 a 4.800.000,00	33,00%	828.000,00

Table C.11: Anexo V: serviços relacionados no 5o-I do art. 18 desta Lei Complementar

	Receita Bruta em 12 Meses (em R$)	**Alíquota**	**Valor a Deduzir (em R$)**
1ª Faixa	Até 180.000,00	15,50%	–
2ª Faixa	De 180.000,01 a 360.000,00	18,00%	4.500,00
3ª Faixa	De 360.000,01 a 720.000,00	19,50%	9.900,00
4ª Faixa	De 720.000,01 a 1.800.000,00	20,50%	17.100,00
5ª Faixa	De 1.800.000,01 a 3.600.000,00	23,00%	62.100,00
6ª Faixa	De 3.600.000,01 a 4.800.000,00	30,50%	540.000,00

Table C.12: Anexo VI: prestação de serviços relacionados no 5o-I do art. 18 desta Lei Complementar

Receita Bruta em 12 meses (em R$)	**Alíquota**	**IRPJ, PIS/Pasep, CSLL, Cofins e CPP**	**ISS**
Até 180.000,00	16,93%	14,93%	2,00%
De 180.000,01 a 360.000,00	17,72%	14,93%	2,79%
De 360.000,01 a 540.000,00	18,43%	14,93%	3,50%
De 540.000,01 a 720.000,00	18,77%	14,93%	3,84%
De 720.000,01 a 900.000,00	19,04%	15,17%	3,87%
De 900.000,01 a 1.080.000,00	19,94%	15,71%	4,23%
De 1.080.000,01 a 1.260.000,00	20,34%	16,08%	4,26%
De 1.260.000,01 a 1.440.000,00	20,66%	16,35%	4,31%
De 1.440.000,01 a 1.620.000,00	21,17%	16,56%	4,61%
De 1.620.000,01 a 1.800.000,00	21,38%	16,73%	4,65%
De 1.800.000,01 a 1.980.000,00	21,86%	16,86%	5,00%
De 1.980.000,01 a 2.160.000,00	21,97%	16,97%	5,00%
De 2.160.000,01 a 2.340.000,00	22,06%	17,06%	5,00%
De 2.340.000,01 a 2.520.000,00	22,14%	17,14%	5,00%
De 2.520.000,01 a 2.700.000,00	22,21%	17,21%	5,00%
De 2.700.000,01 a 2.880.000,00	22,21%	17,21%	5,00%
De 2.880.000,01 a 3.060.000,00	22,32%	17,32%	5,00%
De 3.060.000,01 a 3.240.000,00	22,37%	17,37%	5,00%
De 3.240.000,01 a 3.420.000,00	22,41%	17,41%	5,00%
De 3.420.000,01 a 3.600.000,00	22,45%	17,45%	5,00%

Table C.13: Anexo I pre-reform

Até 180.000,00	4,00%
De 180.000,01 a 360.000,00	5,47%
De 360.000,01 a 540.000,00	6,84%
De 540.000,01 a 720.000,00	7,54%
De 720.000,01 a 900.000,00	7,60%
De 900.000,01 a 1.080.000,00	8,28%
De 1.080.000,01 a 1.260.000,00	8,36%
De 1.260.000,01 a 1.440.000,00	8,45%
De 1.440.000,01 a 1.620.000,00	9,03%
De 1.620.000,01 a 1.800.000,00	9,12%
De 1.800.000,01 a 1.980.000,00	9,95%
De 1.980.000,01 a 2.160.000,00	10,04%
De 2.160.000,01 a 2.340.000,00	10,13%
De 2.340.000,01 a 2.520.000,00	10,23%
De 2.520.000,01 a 2.700.000,00	10,32%
De 2.700.000,01 a 2.880.000,00	11,23%
De 2.880.000,01 a 3.060.000,00	11,32%
De 3.060.000,01 a 3.240.000,00	11,42%
De 3.240.000,01 a 3.420.000,00	11,51%
De 3.420.000,01 a 3.600.000,00	11,61%

Table C.14: Anexo II pre-reform

Até 180.000,00	4,50%
De 180.000,01 a 360.000,00	5,97%
De 360.000,01 a 540.000,00	7,34%
De 540.000,01 a 720.000,00	8,04%
De 720.000,01 a 900.000,00	8,10%
De 900.000,01 a 1.080.000,00	8,78%
De 1.080.000,01 a 1.260.000,00	8,86%
De 1.260.000,01 a 1.440.000,00	8,95%
De 1.440.000,01 a 1.620.000,00	9,53%
De 1.620.000,01 a 1.800.000,00	9,62%
De 1.800.000,01 a 1.980.000,00	10,45%
De 1.980.000,01 a 2.160.000,00	10,54%
De 2.160.000,01 a 2.340.000,00	10,63%
De 2.340.000,01 a 2.520.000,00	10,73%
De 2.520.000,01 a 2.700.000,00	10,82%
De 2.700.000,01 a 2.880.000,00	11,73%
De 2.880.000,01 a 3.060.000,00	11,82%
De 3.060.000,01 a 3.240.000,00	11,92%
De 3.240.000,01 a 3.420.000,00	12,01%
De 3.420.000,01 a 3.600.000,00	12,11%

Table C.15: Anexo III pre-reform (didn't include 5o-D)

Receita Bruta em 12 meses (em R$)	**ALÍQUOTA**
Até 180.000,00	6,00%
De 180.000,01 a 360.000,00	8,21%
De 360.000,01 a 540.000,00	10,26%
De 540.000,01 a 720.000,00	11,31%
De 720.000,01 a 900.000,00	11,40%
De 900.000,01 a 1.080.000,00	12,42%
De 1.080.000,01 a 1.260.000,00	12,54%
De 1.260.000,01 a 1.440.000,00	12,68%
De 1.440.000,01 a 1.620.000,00	13,55%
De 1.620.000,01 a 1.800.000,00	13,68%
De 1.800.000,01 a 1.980.000,00	14,93%
De 1.980.000,01 a 2.160.000,00	15,06%
De 2.160.000,01 a 2.340.000,00	15,20%
De 2.340.000,01 a 2.520.000,00	15,35%
De 2.520.000,01 a 2.700.000,00	15,48%
De 2.700.000,01 a 2.880.000,00	16,85%
De 2.880.000,01 a 3.060.000,00	16,98%
De 3.060.000,01 a 3.240.000,00	17,13%
De 3.240.000,01 a 3.420.000,00	17,27%
De 3.420.000,01 a 3.600.000,00	17,42%

Table C.16: Anexo IV pre-reform

Receita Bruta em 12 meses (em R$)	**Alíquota**
Até 180.000,00	4,50%
De 180.000,01 a 360.000,00	6,54%
De 360.000,01 a 540.000,00	7,70%
De 540.000,01 a 720.000,00	8,49%
De 720.000,01 a 900.000,00	8,97%
De 900.000,01 a 1.080.000,00	9,78%
De 1.080.000,01 a 1.260.000,00	10,26%
De 1.260.000,01 a 1.440.000,00	10,76%
De 1.440.000,01 a 1.620.000,00	11,51%
De 1.620.000,01 a 1.800.000,00	12,00%
De 1.800.000,01 a 1.980.000,00	12,80%
De 1.980.000,01 a 2.160.000,00	13,25%
De 2.160.000,01 a 2.340.000,00	13,70%
De 2.340.000,01 a 2.520.000,00	14,15%
De 2.520.000,01 a 2.700.000,00	14,60%
De 2.700.000,01 a 2.880.000,00	15,05%
De 2.880.000,01 a 3.060.000,00	15,50%
De 3.060.000,01 a 3.240.000,00	15,95%
De 3.240.000,01 a 3.420.000,00	16,40%
De 3.420.000,01 a 3.600.000,00	16,85%

Table C.17: Anexo V Pre-reform

RB em 12 meses	$(r) < 0{,}10$	$0{,}10 - 0{,}15$	$0{,}15 - 0{,}20$	$0{,}20 - 0{,}25$	$0{,}25 - 0{,}30$	$0{,}30 - 0{,}35$	$0{,}35 - 0{,}40$	$(r) \geq 0{,}40$
Até 180k	17,50%	15,70%	13,70%	11,82%	10,47%	9,97%	9,10%	8,00%
180k a 360k	17,52%	15,75%	13,90%	12,60%	12,33%	10,72%	9,10%	8,48%
360k a 540k	17,55%	15,95%	14,20%	12,90%	12,64%	11,14%	9,58%	9,03%
540k a 720k	17,95%	16,70%	15,00%	13,70%	13,45%	12,00%	10,56%	9,34%
720k a 900k	18,15%	16,95%	15,30%	14,03%	13,53%	12,40%	11,04%	10,06%
900k a 1.080k	18,45%	17,20%	15,40%	14,10%	13,60%	12,60%	11,60%	10,60%
1.080k a 1.260k	18,55%	17,30%	15,50%	14,11%	13,68%	12,69%	11,69%	10,69%
1.260k a 1.440k	18,62%	17,32%	15,60%	14,12%	13,69%	12,69%	11,69%	10,69%
1.440k a 1.620k	18,72%	17,42%	15,70%	14,13%	14,08%	13,09%	12,08%	11,08%
1.620k a 1.800k	18,86%	17,56%	15,80%	14,14%	14,09%	13,09%	12,09%	11,09%
1.800k a 1.980k	18,96%	17,66%	15,90%	14,49%	14,45%	13,61%	12,78%	11,87%
1.980k a 2.160k	19,06%	17,76%	16,00%	14,67%	14,64%	13,79%	13,15%	12,28%
2.160k a 2.340k	19,26%	17,96%	16,20%	14,86%	14,82%	14,17%	13,54%	12,68%
2.340k a 2.520k	19,56%	18,30%	16,50%	15,46%	15,18%	14,61%	14,04%	13,26%
2.520k a 2.700k	20,79%	19,30%	17,45%	16,24%	16,00%	15,52%	15,03%	14,29%
2.700k a 2.880k	21,20%	20,00%	18,28%	16,91%	16,72%	16,32%	15,93%	15,23%
2.880k a 3.060k	21,70%	20,50%	18,70%	17,40%	17,13%	16,82%	16,38%	16,17%
3.060k a 3.240k	22,20%	21,00%	19,10%	17,90%	17,55%	17,22%	16,82%	16,51%
3.240k a 3.420k	22,50%	21,30%	19,50%	18,20%	17,97%	17,44%	17,24%	16,94%
3.420k a 3.600k	22,90%	21,80%	20,00%	18,60%	18,40%	17,85%	17,60%	17,18%