

Income Shifting vs Real Responses in Simplified Tax Regimes¹

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¹The views expressed in this presentation are those of the authors and do not necessarily represent those of the Receita Federal do Brasil (RFB). Any analysis of RFB tax data was conducted on RFB's premises by its employees. We thank the European Union Tax Observatory for its support.

Outline

1 Motivation

2 Context and Data

3 Panel of Cross-section

- The Movie
- Understanding the Bunching

4 Difference in Difference Analysis

- Sample Selection
- Preliminary Results

5 Model

Motivation

Small and medium-sized firms (SMEs) play a central role in economic activity worldwide.

- ▶ Most countries have simplified tax regimes to promote SMEs registration
- ▶ Common in these regimes are revenue taxes → very easy to report

① Efficiency considerations

- ★ Highly distorting → no cost deductibility
- ★ Labor-intensive firms are more negatively affected (horizontal inequity)

② Evasion and avoidance considerations

- ★ Low-reporting requirements and monitoring facilitate taking advantage of the system

This paper studies a policy that changed revenue taxes to take into account efficiency considerations, but opened loopholes for income-shifting

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Motivation

Understanding in which margins different firms are elastic is critical

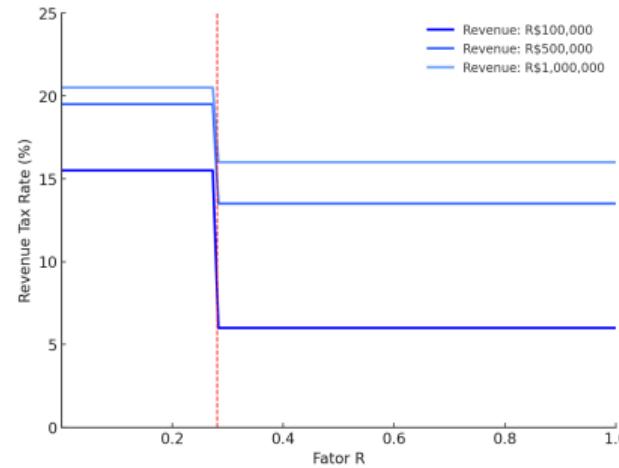
- ① If labor demand and production are very elastic to tax rates → rational to promote growth
 - Key parameters: $\varepsilon_R = \frac{dR}{d(1-\tau_R)} \frac{(1-\tau_R)}{R}$ and $\varepsilon_L = \frac{dL}{d(1-\tau_R)} \frac{(1-\tau_R)}{L}$
- ② If income shifting is very elastic to tax arbitrage opportunities → rational for different tax regimes
 - The U.S. has a specific tax regime for pass-through businesses
 - How does income shifting affect effective tax rates and inequality?

Motivation: Factor R Policy

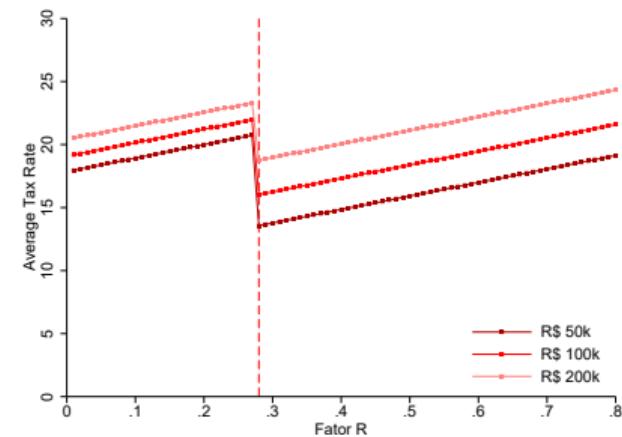
Factor R: Share of *total payroll* over *total revenues*

- ▶ Eligible firms with Factor R > 0.28 receive a substantial revenue tax cut
- ▶ Tot Payroll: Gross wages, **pro-labore**, contractors, CPP!, FGTS, 13th salary
- ▶ Introduces a significant notch in the tax schedule

Average Tax Rate as a function of Factor R

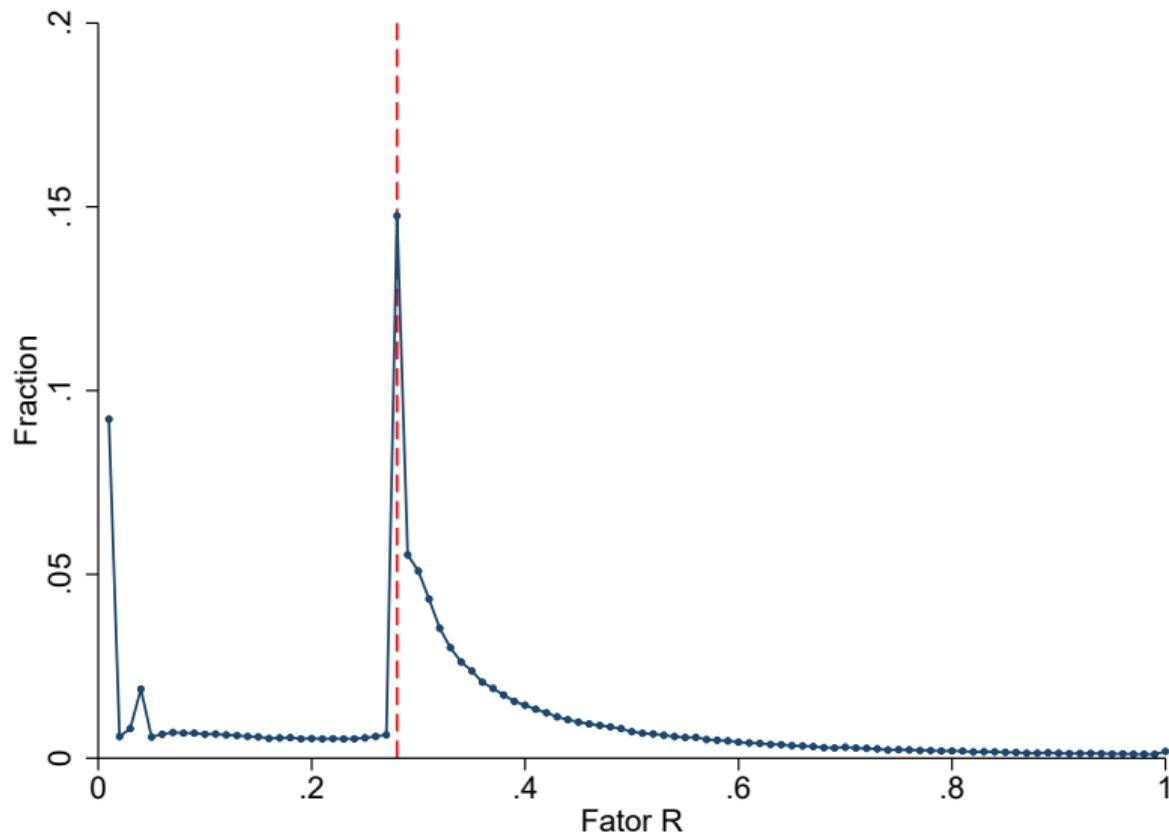


(a) Not including payroll taxes



(b) Including payroll taxes

Fator R Distribution



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Taxes on Firms in Brazil

Four big tax regimes

① Standard Profit Tax Regime (*Lucro Real*)

- Very large firms (2.5%)
- 15 to 35% marginal tax rates + SSC + VAT

② Presumptive profits (*Lucro Presumido*)

- < \$R 78M annual revenues (US\$ 15.6M); medium-large firms (16.7%)
- Tax base = C x Revenues; tax rate 15-34% + SSC; several tax forms (e.g., ICMS)

③ Simplified Tax Regime (*Simples Nacional*)

- < \$R 4.8M annual revenues (US\$ 1M); small-medium firms (80.8%)
- Only one tax form → Tax rate on revenues that varies with industry and revenue level

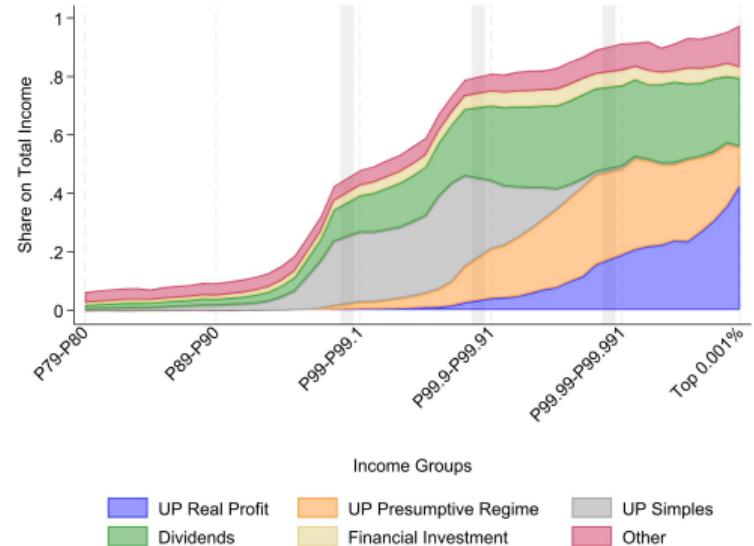
④ Self-employed (*Microempreendedor Individual*)

- < \$R 81,000 annual revenues (US\$ 16,000); 11M self-employed (1/4 of formal employment)
- Taxes: Fixed amount

Who are Simples Nacional Owners?



(a) Effective tax rates



(b) Business income

Source: Palomo et al. 2025

Simplified Tax Regime: Industry Classification

- ▶ Anexo I: Commerce
- ▶ Anexo II: Manufacturing
- ▶ Anexo III: Services I
- ▶ Anexo IV: Services II
- ▶ **Anexo V:** Services III
- ▶ Anexo VI (it doesn't exist anymore): Services

Anexos define what is the tax rate paid by firms

- ▶ Firms in Anexo V are subject to Fator R

Simplified Tax Regime: Marginal Tax Rates

Tax Schedule by Anexo

Revenues last 12 months (R\$)	Anexo I	Anexo II	Anexo III	Anexo IV	Anexo V
Até 180,000	4.00%	4.50%	6.00%	4.50%	15.50%
180,000 to 360,000	7.30%	7.80%	11.20%	9.00%	18.00%
360,000 to 720,000	9.50%	10.00%	13.50%	10.20%	19.50%
720,000 to 1,800,000	10.70%	11.20%	16.00%	14.00%	20.50%
1,800,000 to 3,600,000	14.30%	14.70%	21.00%	22.00%	23.00%
3,600,000 to 4,800,000	19.00%	30.00%	33.00%	33.00%	30.50%

Simplified Tax Regime: Marginal Tax Rates

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720,000 to 1,800,000	10.70%	11.20%	16.00%	14.00%	20.50%
1,800,000 to 3,600,000	14.30%	14.70%	21.00%	22.00%	23.00%
3,600,000 to 4,800,000	19.00%	30.00%	33.00%	33.00%	30.50%

Firms in Anexo V are switched to Anexo III if Fator R ≥ 0.28

Reform: Implemented in January 2018

① Which activities are subject to Factor R (Anexo V post-reform)

- Firms in Anexo VI pre-reform (Anexo VI eliminated) See
 - ★ Factor R bites for firms < 0.28 pre-reform
 - ★ Only change (drop) in revenue tax rates for firms > 0.28 pre-reform
- Some activities previously in Anexo III or Anexo V
- New firms

② Other changes:

- Threshold to be eligible for SIMPLES was increased from 3.6M to 4.8M
- There were 20 tax brackets. Simplified to 6. Similar on average, except 3.6M-4.8M

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- There were 20 tax brackets. Simplified to 6. Similar on average, except 3.6M-4.8M

Before and After Tax Schedules: Strongly affected

Pre-reform: Anexo VI

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: Subject to Factor R

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%

Before and After Tax Schedules: Not affected

Pre-Reform: Anexo IV

Annual Revenues (R\$)	Tax Rate
180,000	4.50%
180,000 - 360,000	6.54%
360,000 - 540,000	7.70%
540,000 - 720,000	8.49%
720,000 - 900,000	8.97%
900,000 - 1,080,000	9.78%
1,080,000 - 1,260,000	10.26%
1,260,000 - 1,440,000	10.76%
...	...
3,420,000 - 3,600,000	16.85%

Post-Reform: Anexo IV

Annual Revenues (R\$)	Tax Rate
180,000	4.50%
180,000 a 360,000	9.00%
360,000 a 720,000	10.20%
720,000 a 1,800,000	14.00%
1,800,000 a 3,600,000	22.00%
3,600,000 a 4,800,000	33.00%

Data

(1) PGDAS

- ▶ Tax form for firms in the simplified tax regime
- ▶ Self-report the activity → system determines the Anexo
- ▶ Self-report current and accumulated 12-month revenues
- ▶ If subject for Factor R, self-report current and accumulated 12-month payroll
 - Anexo VI pre-reform also reported Factor R!
- ▶ System shows the tax rate and tax due (easy to manipulate)

(2) e-Social

[See Factor R comparison](#)

- ▶ Mandatory since Aug 2018 for all firms with any employment or SSC responsibilities
- ▶ Data at the *rubrica* level: reason of payment (we observe **prolabore**)
- ▶ Available for all firms, regardless of Factor R

(3) GFIP (e-social pre 2018)

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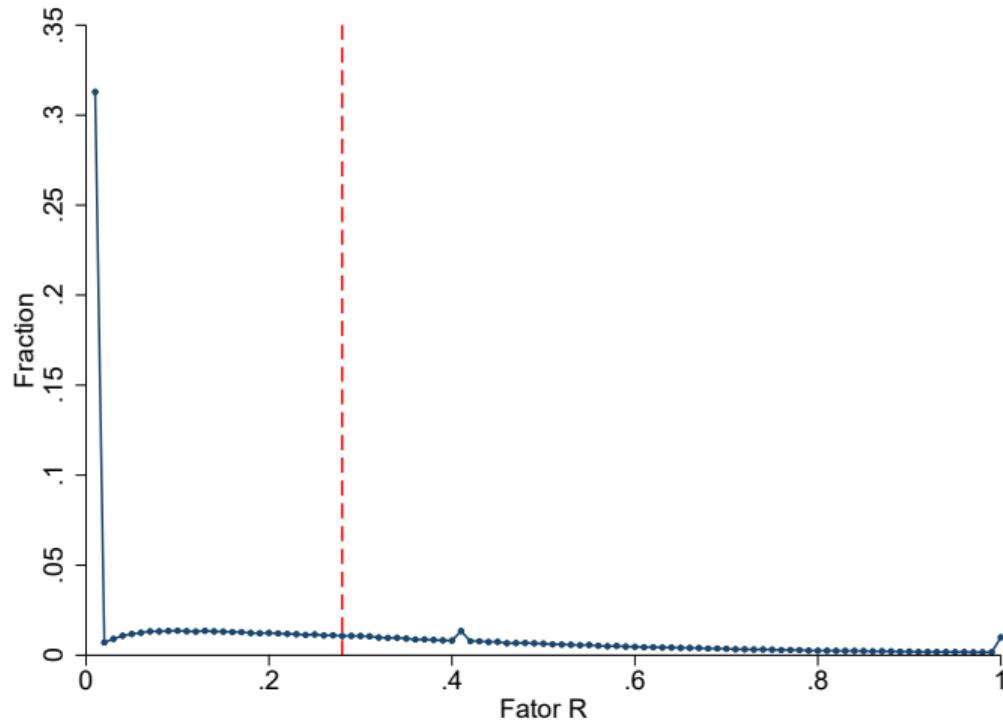
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Pre-reform

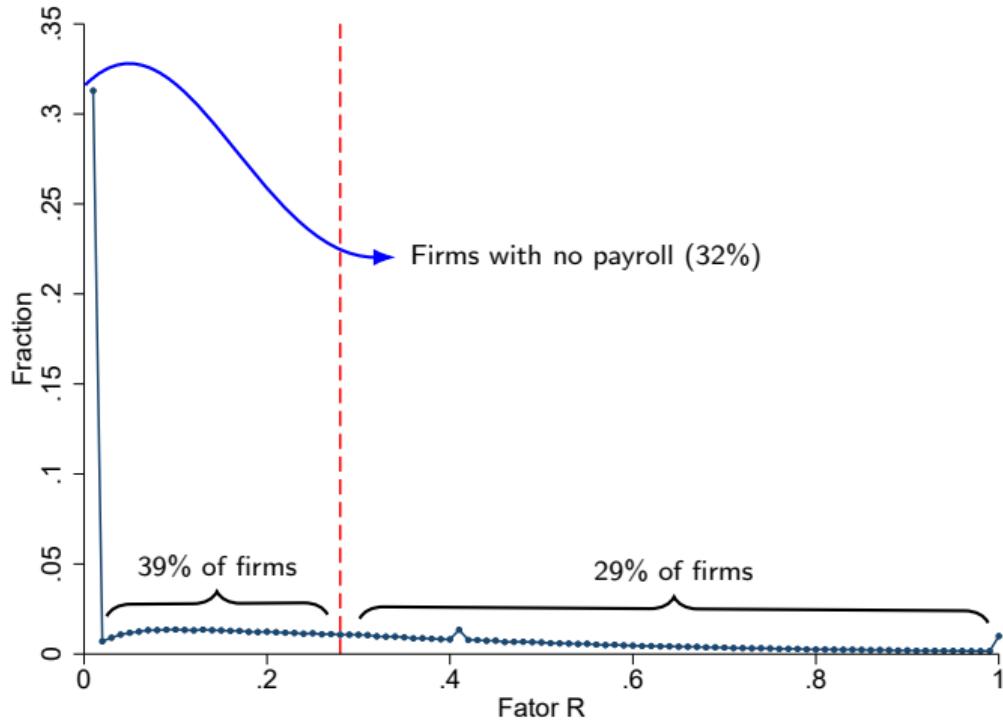
Pre-reform Factor R Distribution



Exclude 0

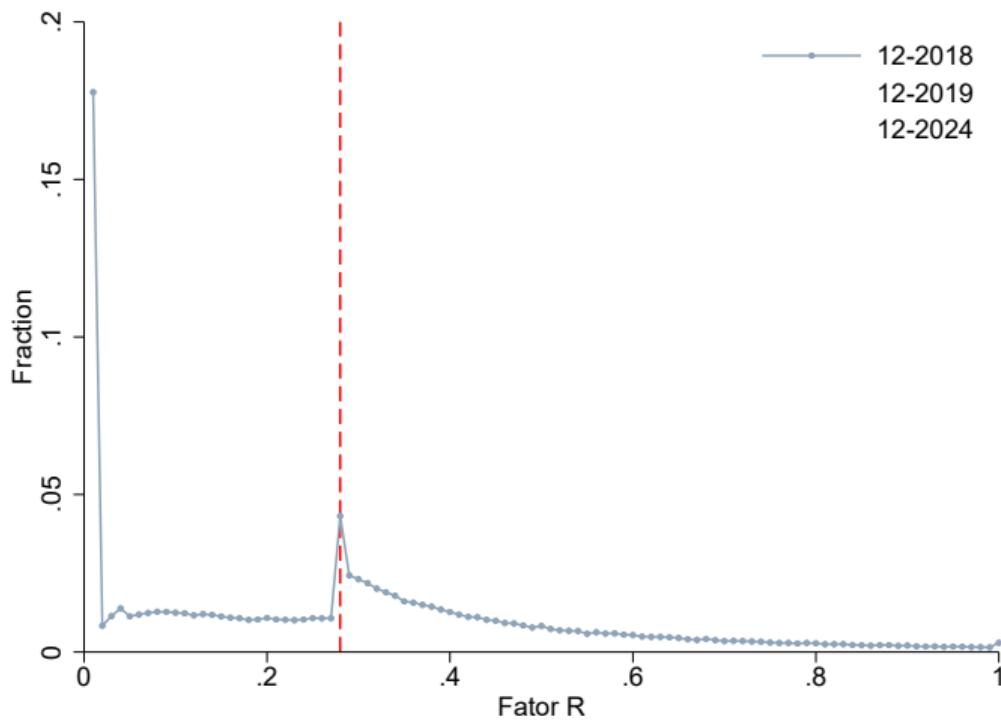
Pre-reform

Pre-reform Factor R Distribution



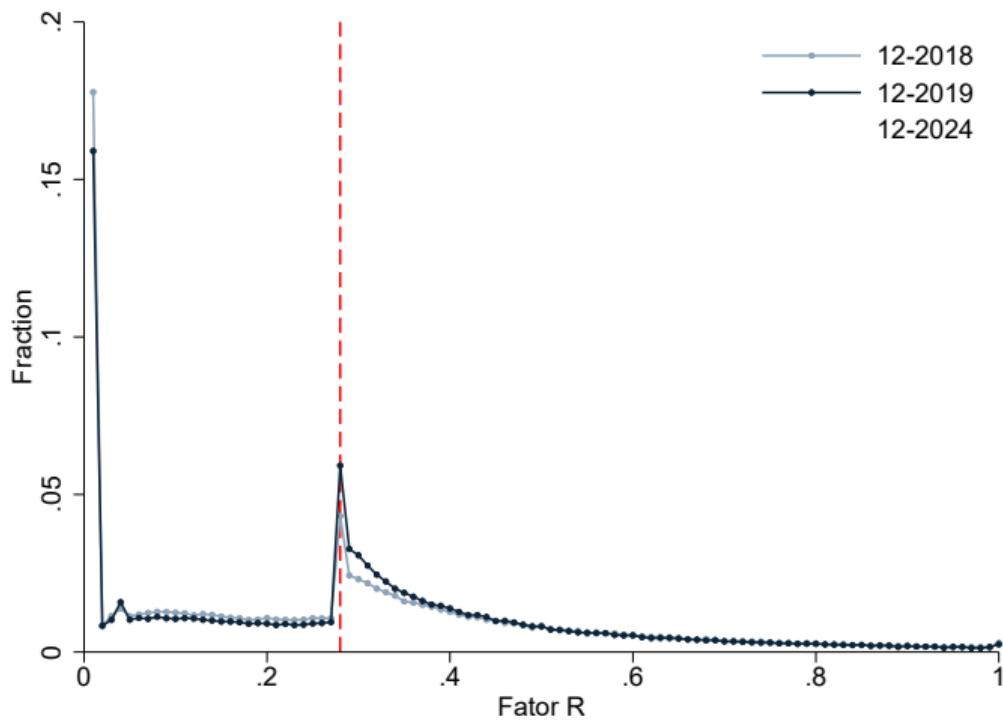
Post Reform

Post-reform Factor R Distribution



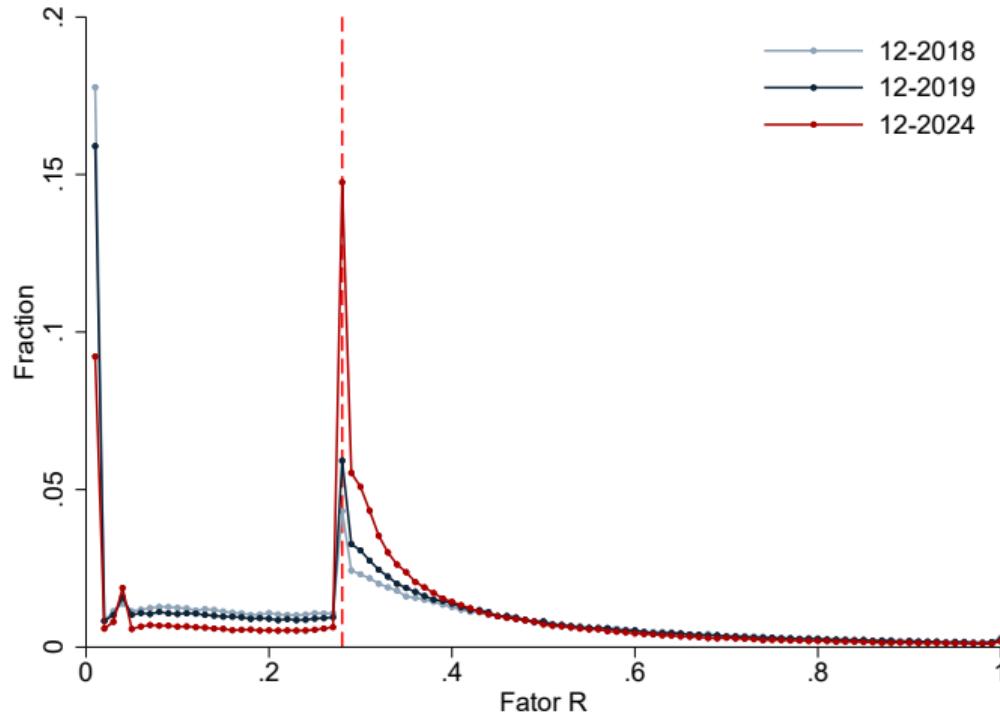
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Post-reform Factor R Distribution



Post Reform

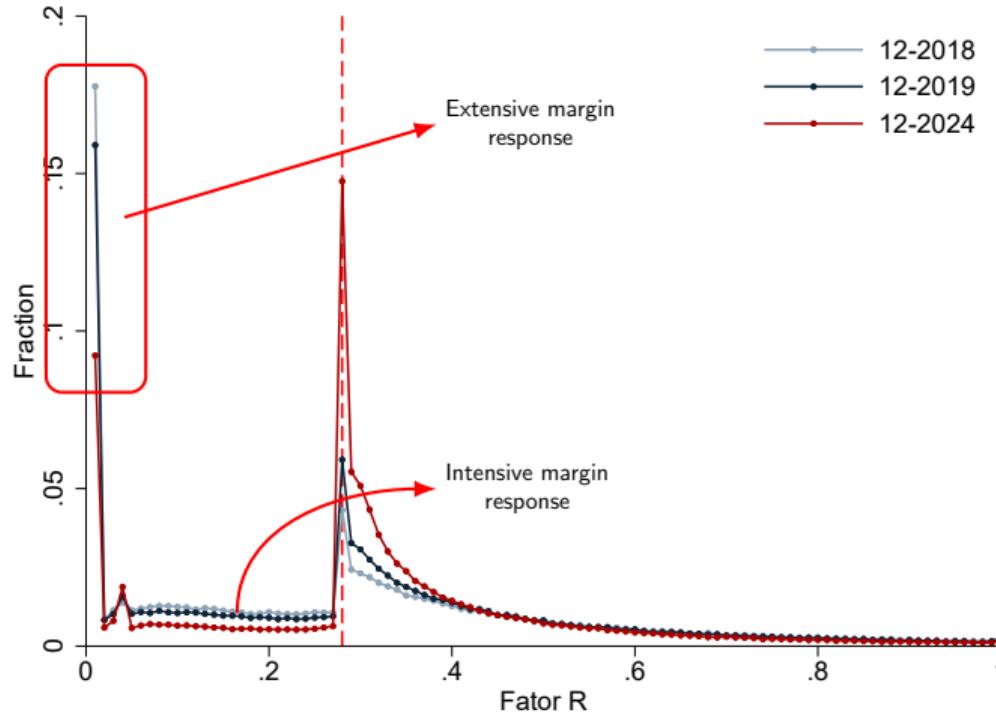
Post-reform Factor R Distribution



Bunching grows over time: learning?

Post Reform

Post-reform Factor R Distribution



Excess mass comes both from the extensive and intensive margin

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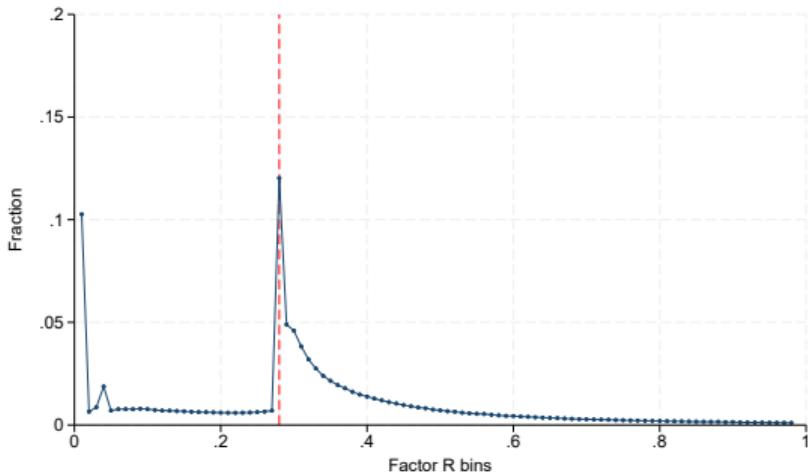
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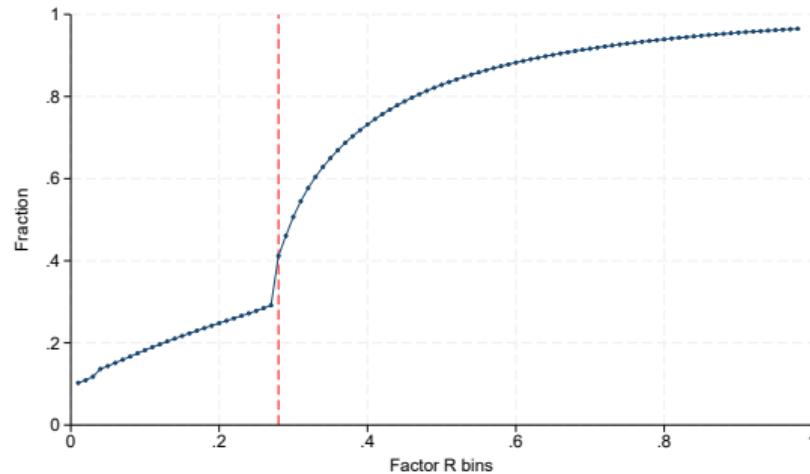
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Tax Notch based on Factor R: in the data

Factor R distribution for active firms in 2023



(a) PDF

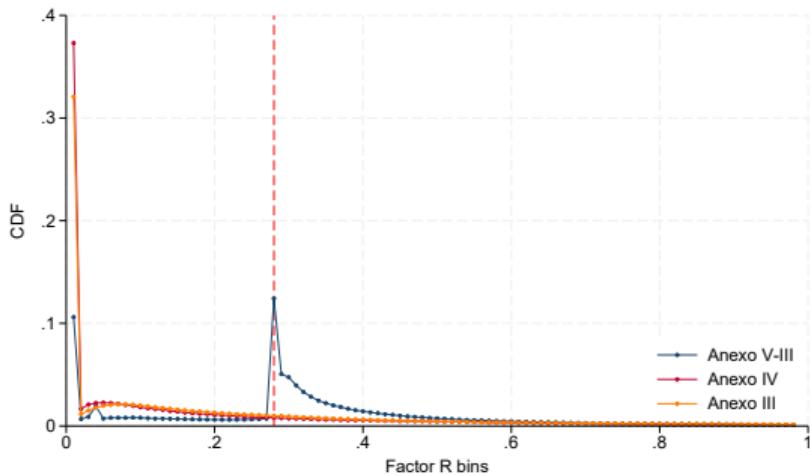


(b) CDF

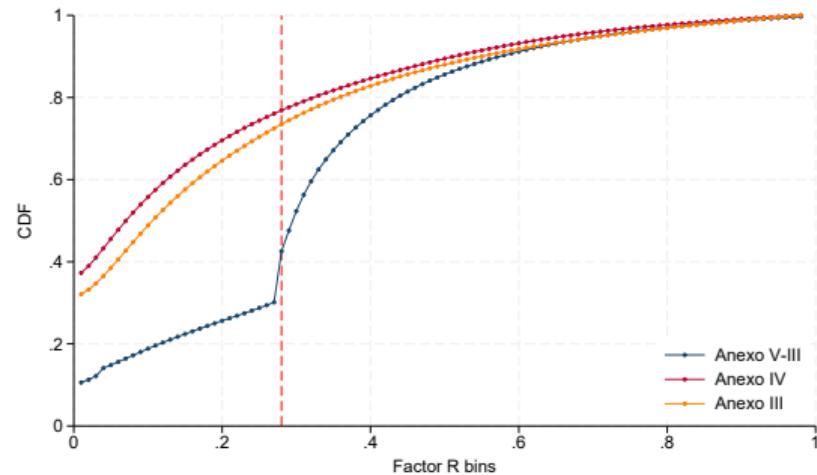
Striking bunching + hole in the distribution

Tax Notch based on Factor R: in the data

Factor R distribution for active firms in 2023



(a) PDF



(b) CDF

Service sector not subject to Factor R has no bunching

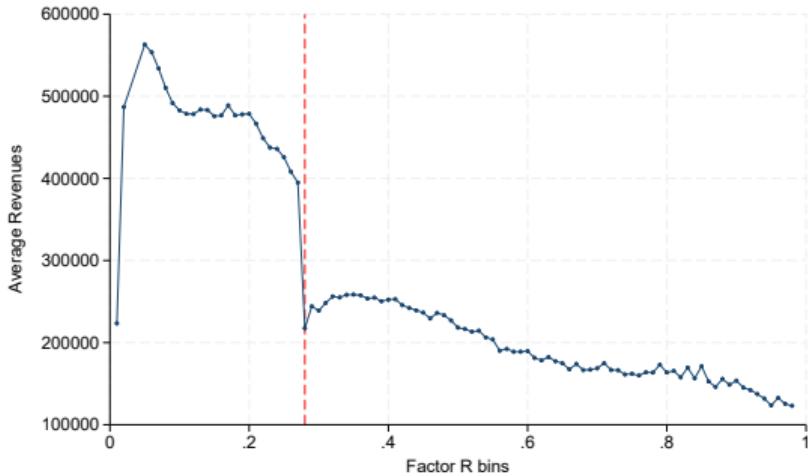
Understanding the bunching

We decompose the Factor R into:

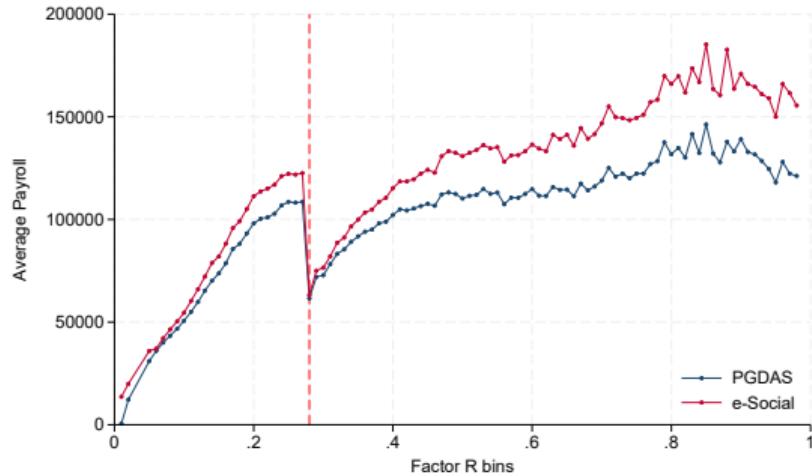
- ▶ Reducing Revenues
- ▶ Increasing Total Payroll
 - Income shifting (prolabore)
 - Employees' payroll

Understanding the bunching

Factor R decomposition



(a) Av. Revenues (last 12 months)

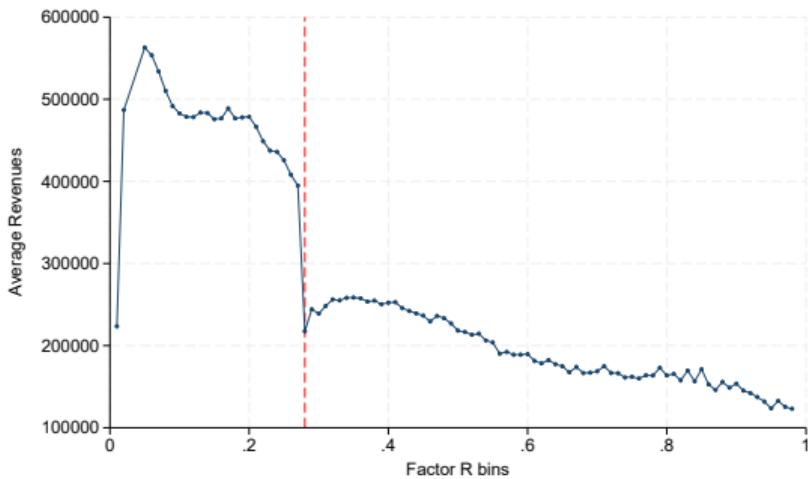


(b) Av. Payroll (last 12 months)

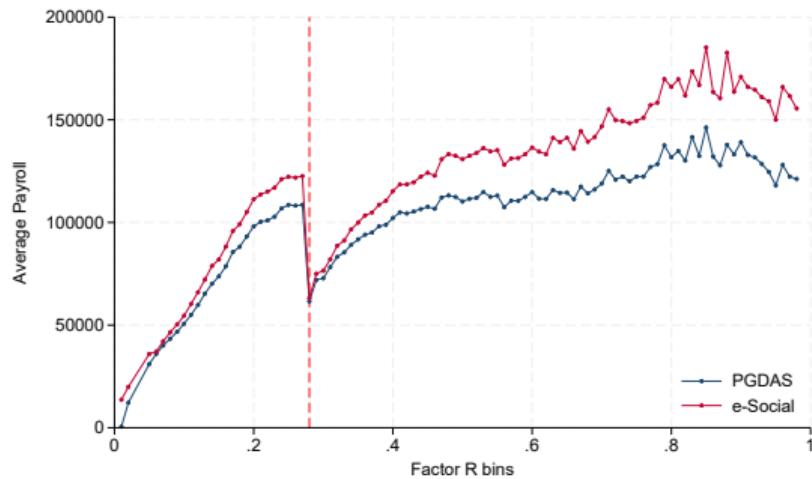
- ▶ Firms at the cutoff have 45% drop in revenues and a 43% drop in total payroll
- ▶ Selection of small firms bunching, lowering the average numerator and denominator

Understanding the bunching

Factor R decomposition



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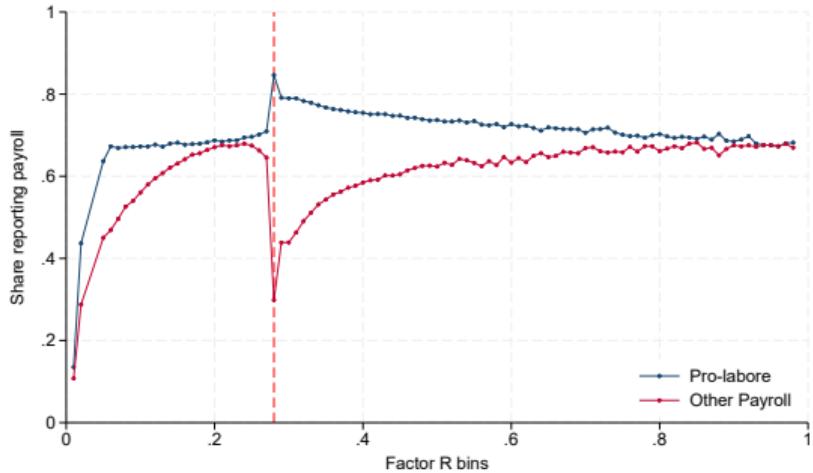


(b) Av. Payroll (last 12 months)

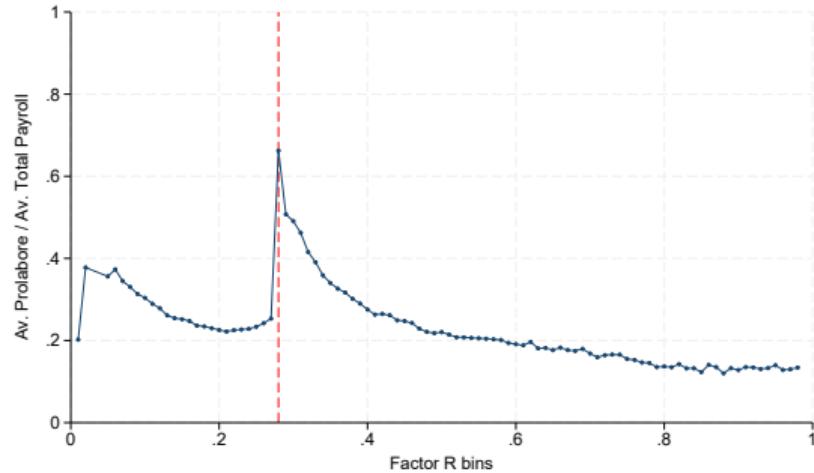
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Understanding the bunching

Factor R decomposition



(a) By type of payroll

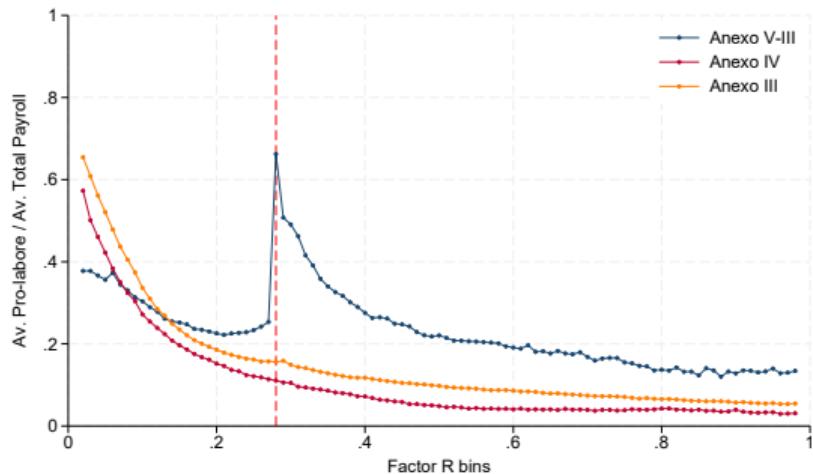


(b) Av. Prolabore / Av. Other Payroll

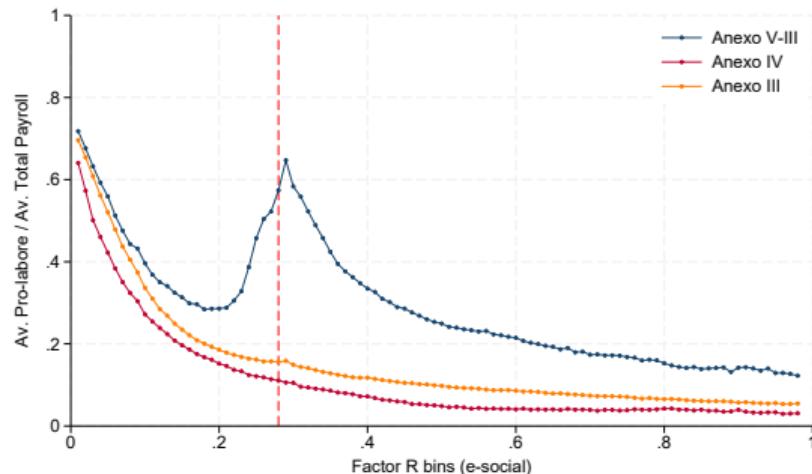
- ▶ The share of firms that report at least some pro-labore increases at the cutoff
- ▶ Prolabore relative importance increases by 3 times at the cutoff

Understanding the bunching

Factor R decomposition



(a) Factor R from PGDAS



(b) Factor R from e-Social

Smooth distribution for service sectors not subject to Factor R

Takeaways

- ▶ Massive bunching at Factor R = 0.28
- ▶ Missing mass affecting even the extensive margin of reporting positive payroll
- ▶ Small firms manipulating prol labore explain selection at the bunching
 - Av revenues are smaller for bunchers
 - Av total payroll is smaller for bunchers
 - Av prol labore is larger for bunchers

Challenges to Cross-sectional Variation

Strong response to the policy to get a Factor R > .28, but:

- ▶ How large are these elasticities?
- ▶ Which firms drive the effects? New entrants, incumbents, etc.
- ▶ Do different firms respond in different margins?
- ▶ Are there any real effects?

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Sample Construction

- ▶ Several groups of firms/activities will enter the new Anexo V (subject to Factor R)
- ▶ To keep the composition fixed, we follow the cohorts defined in December 2017
 - ① In Anexo VI (moved to Anexo V)
 - ② In Anexo IV (mostly remained in Anexo IV)
- ▶ Preliminary results comparing these groups
 - ① First stage: Transition and average revenue tax rates
 - ② Outcomes: Pro-labore, revenues and payroll
 - ③ Heterogeneity based on high vs. low Factor R pre-reform

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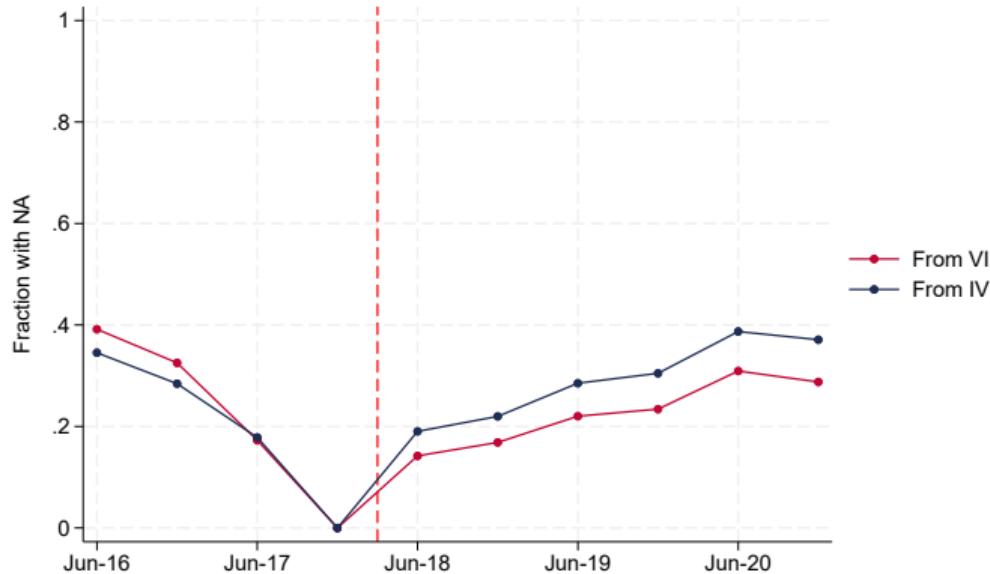
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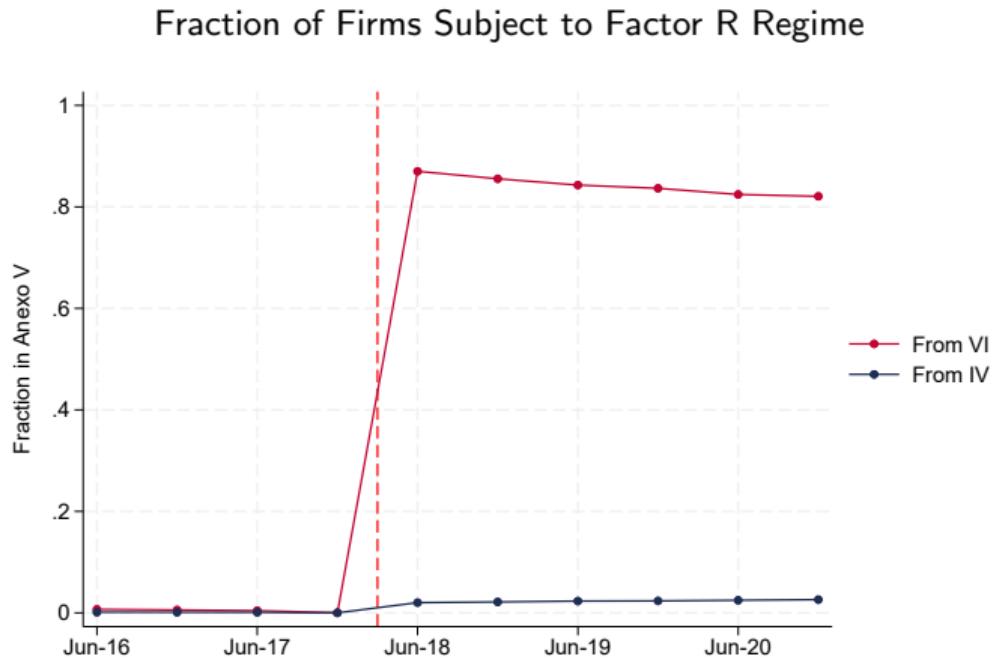
Attrition

Fraction of non-active Firms (cond. on Rev > 0 in Dec-2017)



Extensive margin may be relevant (not today)

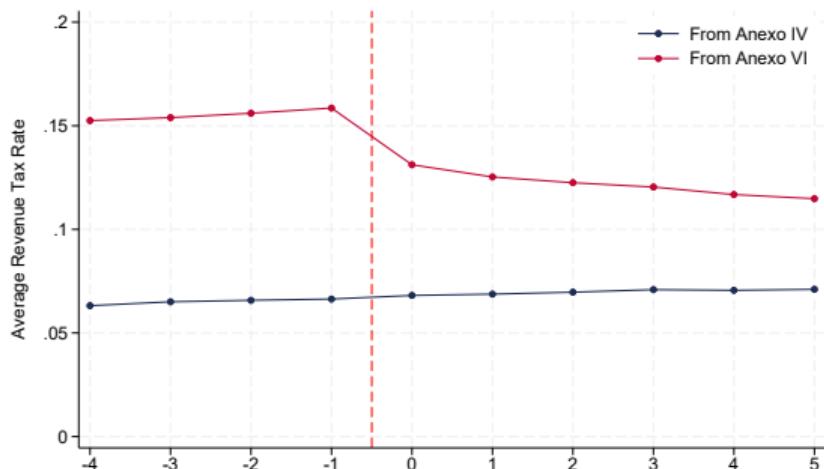
First Stage: Transition



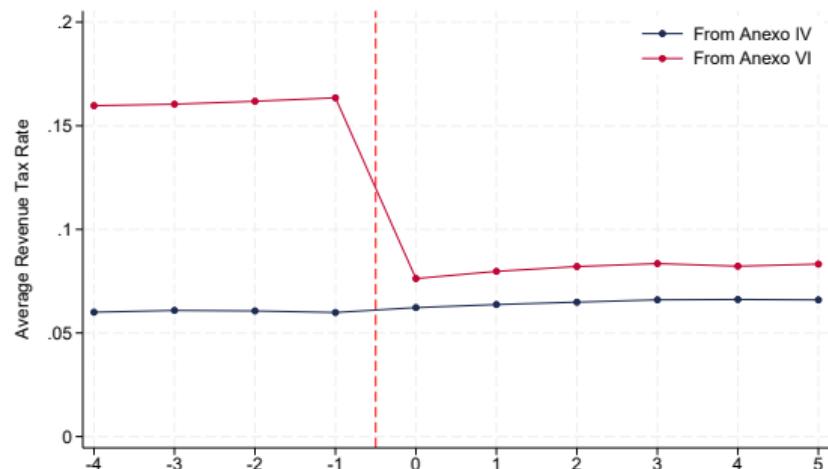
Large share of firms in Anexo VI exposed to the policy

Effective Tax Rates: Firms active in all periods

Average Revenue Tax Rates



(a) Factor R < 0.28 pre-reform

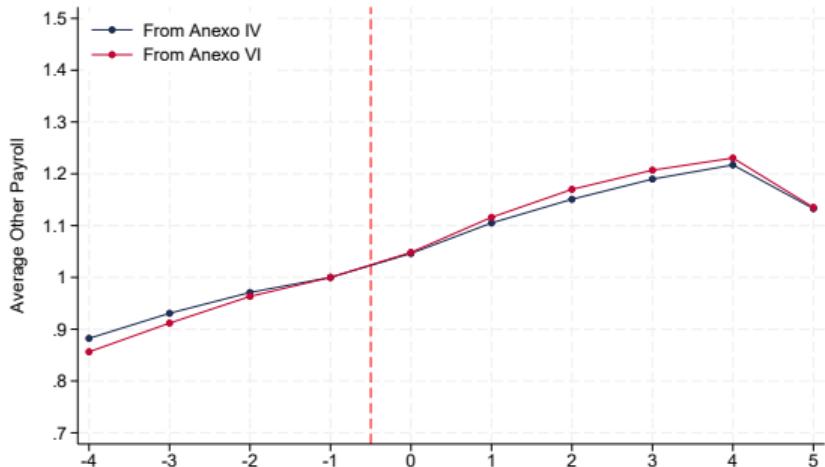


(b) Factor R > 0.28 pre-reform

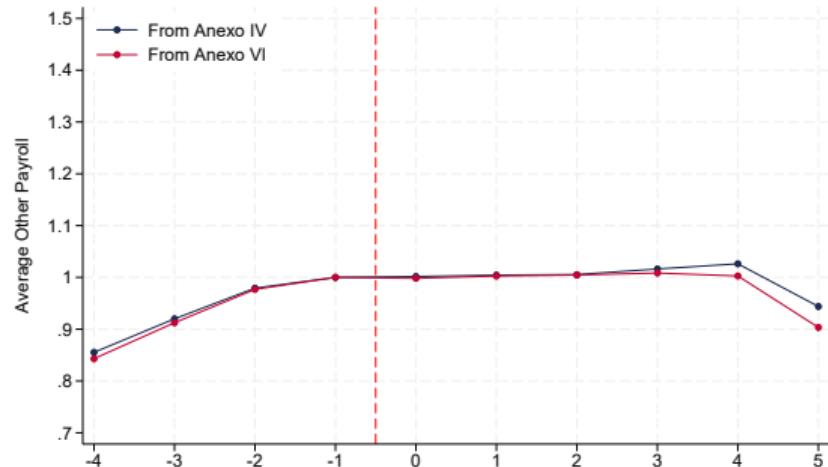
Large drop in average revenue tax rate → consistently larger for $> .28$

Employees' Payroll: Firms active in all periods

Employees' Payroll (Relative to Dec-2017, Adj. by Inflation)



(a) Factor R < 0.28 pre-reform

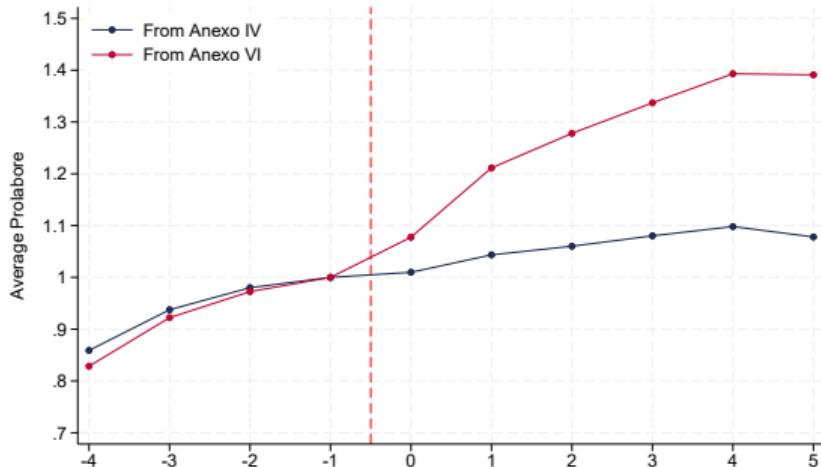


(b) Factor R > 0.28 pre-reform

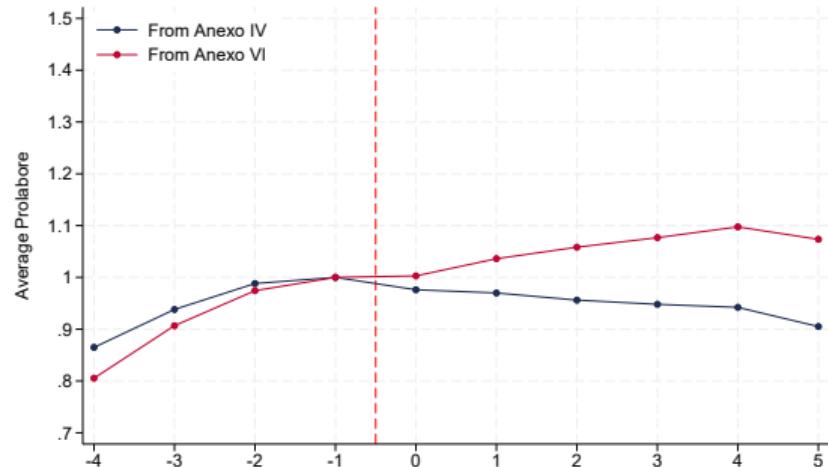
Small (if not zero) effect on employees' payroll

Prolabore: Firms active in all periods

Prolabore (Relative to Dec-2017, Adj. by Inflation)



(a) Factor $R < 0.28$ pre-reform

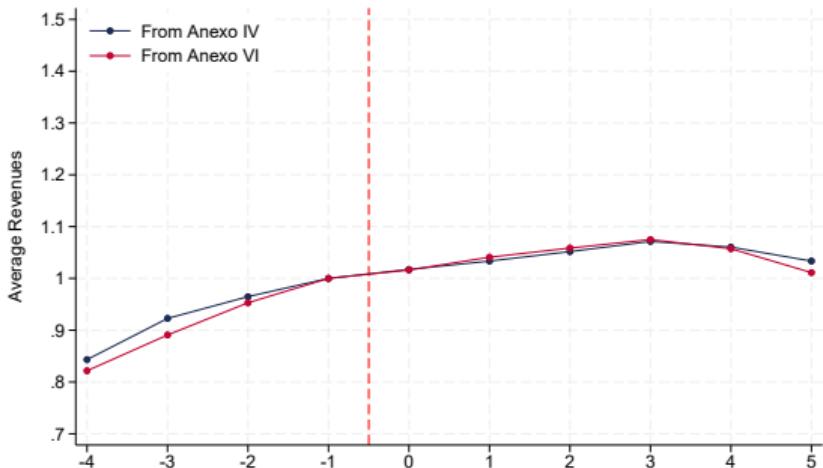


(b) Factor $R > 0.28$ pre-reform

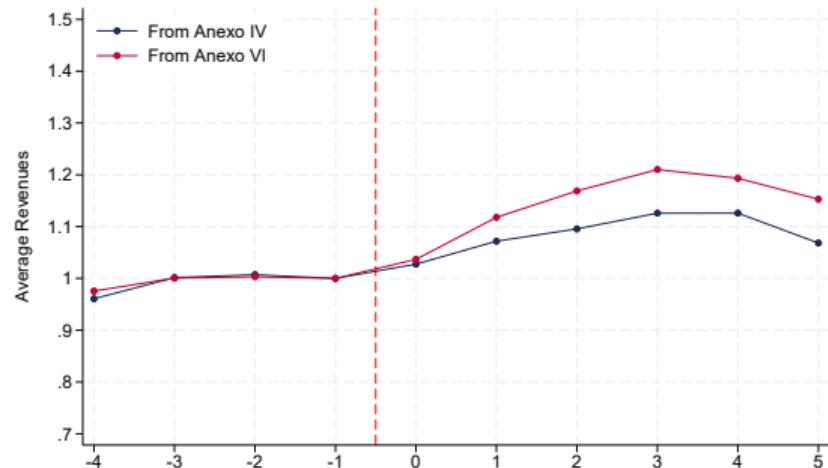
Very large increase (30%) in prolabore, mostly concentrated in firms with Factor $R < .28$

Revenues: Firms active in all periods

Annual Revenues (Relative to Dec-2017, Adj. by Inflation)



(a) Factor R < 0.28 pre-reform

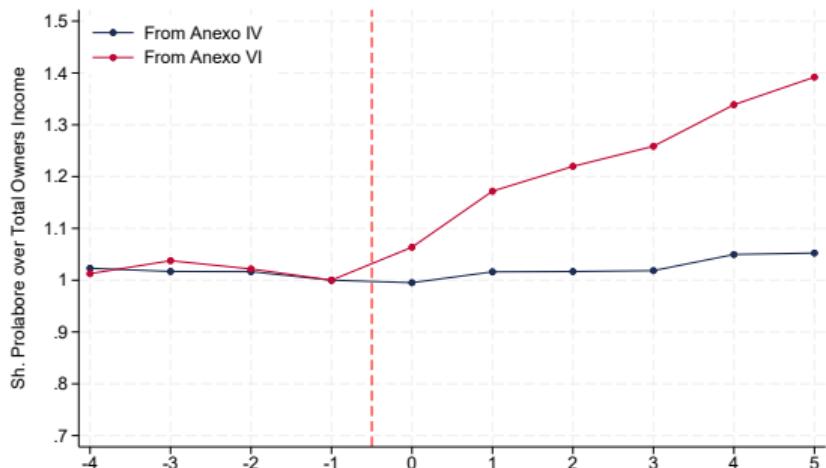


(b) Factor R > 0.28 pre-reform

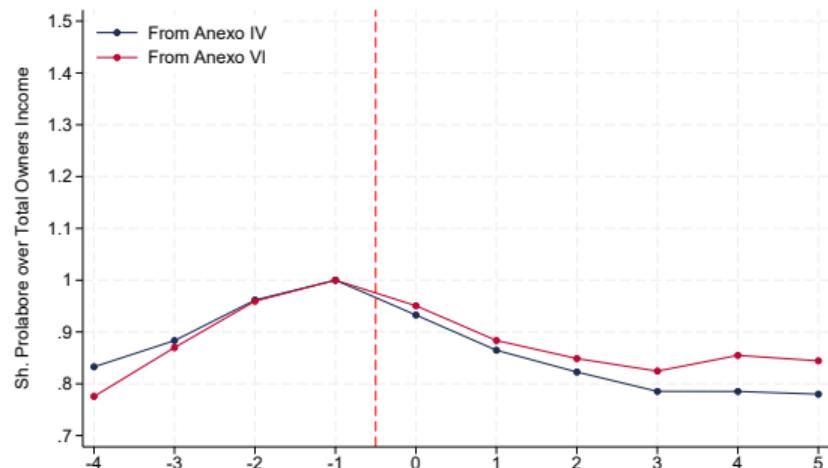
Non-negligible increase ($\sim 9\%$) in revenues for firms with Factor R > .28

Sh. of Owners Income paid as prolabore: Firms active in all periods

Share of Owners Income paid as prolabore (Relative to Dec-2017, Adj. by Inflation)



(a) Factor R < 0.28 pre-reform



(b) Factor R > 0.28 pre-reform

Income-shifting almost entirely explained by firms with Factor R < .28

Revenue Elasticity

$$\varepsilon_R = \frac{\Delta R}{\Delta(1 - \tau_R)} \frac{(1 - \tau_R)}{R} = \frac{.09 * 226,686}{.095} \frac{.837}{226,686} = .793$$

- ▶ Not well-documented in the literature
- Lobel et al. 2024: Introduction of minimum revenue tax shielded $\varepsilon_R = .4$
- Heim 2010: ETI for self-employed in the intensive margin $\varepsilon_R = .9$ (half real effects)

With no effect on employment, what generates the increase in revenues?

- ① Reduction in under-reporting, favoring models where $C'(\text{Unreported}) = \tau_R$
- ② Increase in owners' labor supply
- ③ Increase in other inputs

Income-Shifting Elasticity

- Miller et al. 2019: owner-managers temporarily retain income in the firm (UK)
- Alstadsæter and Jacob 2016: 10pp drop in dividend tax ↑ $\frac{\text{Dividend}}{\text{Overall Income}}$ by 3% and 6.1% long term (Sweden)
- Harju and Matikka 2014: ↑ 1-euro tax optimal gross wage yields ↑ 0.66-euro realized gross wage (Finland)
- Pirttilä and Selin 2011: Evidence of income-shifting for the self-employed and no effect in total income (Finland)

How do we estimate the change in incentives?

- ▶ Key concept: change in the return of reporting one unit of income as wages relative to dividends

Basic Case: No Personal Income Tax

Return per dollar of owners' wages reported

- Revenues: R_j
- Total Payroll (incl. owners' wages) before the policy: P_{0j}
- Factor R: $FR_j = \frac{P_{0j}}{R_j}$
- Threshold: $T = 0.28$

$$\Delta P_j^* = (T - FR_j)R_j \quad \rightarrow \text{Increase in owner's wages to get the revenue tax cut}$$

$$\text{Saving}_j = \Delta\tau_R \cdot R_j \quad \rightarrow \text{Tax savings from getting to the threshold}$$

Then, the per dollar of additional prolabore used to cross the threshold is:

$$\frac{\text{Saving}_j}{\Delta P_j^*} = \frac{\Delta\tau_R \cdot R_j}{(T - FR_j)R_j} = \frac{\Delta\tau_R}{(T - FR_j)} \quad (1)$$

Basic Case: No Personal Income Tax

Then, the change in returns of reporting one unit of income as wages relative to dividends is:

$$\Delta \ln \left(\frac{P_j^W}{P_j^D} \right) = \ln \left(\frac{1 + \frac{\Delta \tau_R}{(T - FR_j)}}{1 - \tau_D} \right) - \ln \left(\frac{1}{1 - \tau_D} \right) \quad (2)$$

In the absence of dividend taxes (τ_D) this expression reduces to:

$$\Delta \ln \left(\frac{P_j^W}{P_j^D} \right) = \ln \left(1 + \frac{\Delta \tau_R}{(T - FR_j)} \right) \quad (3)$$

Defining s_j as the sh. of owners' income paid as wages, the income-shifting elasticity is:

$$\varepsilon_S = \frac{1}{N} \sum_j \varepsilon_{Sj} = \frac{1}{N} \sum_j \left(\frac{\Delta \ln(s_j)}{\ln \left(1 + \frac{\Delta \tau_R}{(T - FR_j)} \right)} \right) \quad (4)$$

Basic Case: No Personal Income Tax

Assuming $FR_j = \frac{1}{N} \sum_j FR_j = 0.05$, we find:

$$\varepsilon_S = \frac{.4}{\ln(1 + \frac{.095}{.28 - .05})} = 1.157$$

↑ 1% in the net-of-tax return to reporting income as wages rather than dividends leads share of income reported as wages to increase by 1.157%, holding total owners' income fixed

Real Case: Convex Tax Schedule on Owner's Wages

How does the elasticity formula change when owners pay progressive taxes on wages?

$$\Delta P_j^* = (T - FR_j)R_j$$

→ Increase in owner's wages to get the revenue tax cut

$$\text{Saving}_j = \Delta\tau_R \cdot R_j$$

→ Tax savings from getting to the threshold

$$\text{Wage Tax}_j = T(P_{0j} + \Delta P_j^*) - T(P_{0j})$$

→ Wage taxes on the additional owner's wages

We can define the average wage tax rate on the additional owner's wage as:

$$\bar{\tau}_{Wj} = \frac{T(P_{0j} + \Delta P_j^*) - T(P_{0j})}{\Delta P_j^*}$$

Real Case: Convex Tax Schedule on Owner's Wages

Then, the net-of-tax return per dollar of owner's wages to get to the threshold is:

$$P_j^W = 1 - \bar{\tau}_{Wj} + \frac{\Delta\tau}{T - FR_j}$$

This implies that the denominator of the elasticity becomes:

$$\Delta \ln \left(\frac{P_j^W}{P_j^D} \right) = \ln \left(1 - \bar{\tau}_{Wj} + \frac{\Delta\tau_R}{(T - FR_j)} \right) - \ln (1 - \bar{\tau}_{Wj})$$

Where,

$$\bar{\tau}_{Wj} = \frac{T(P_{0j} + \Delta P_j^*) - T(P_{0j})}{\Delta P_j^*} = \frac{T(P_{0j} + (T - FR_j)R_j) - T(P_{0j})}{(T - FR_j)R_j}$$

Now both heterogeneities (initial revenues and initial FR) are important to recover ε_S

Next Steps

Further Analysis

- ① Extensive margin → incorporate into the elasticities
- ② Proper Dif-in-Dif IV estimation of the elasticities
- ③ Heterogeneity based on the number of employees
- ④ Can we say something about entry?

Additional data: tracking owners

- ① Credit card consumption
- ② Linked to income distribution and effective tax rates
- ③ Employees receiving wages through firms

Thank you
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Outline

1 Motivation

2 Context and Data

3 Panel of Cross-section

- The Movie
- Understanding the Bunching

4 Difference in Difference Analysis

- Sample Selection
- Preliminary Results

5 Model

Owners Primitives

$$Y_i = w_o [1 - T(w_o)] + \Pi_i (1 - \tau_d),$$

$$\Pi_i = (1 - \tau) A_i (L_w + 1)^{\beta_i} - (w L_w + w_o) - G$$

- ▶ Y_i is owners' total income, which can be paid in two ways
 - Owner's wages (*pro labore*) facing a convex tax schedule
 - Firm's profits distributed as dividends (Brazil has zero dividend taxes)
- ▶ Π_i is the owner's business profits, which uses two inputs and faces two types of costs
 - The owner supplies one unit of labor inelastically and hires L_w units of labor
 - The owner pays her own wages, workers' wages, and a fixed cost
- ▶ Two corner solutions in the firm's problem
 - Entry condition governed by G
 - Hiring employees governed by $A_i = F'(1)$

Benchmark Case: Brazil Tax Rates

Set $\tau_d = 0$, $T'(\cdot) \geq 0$, $T''(\cdot) \geq 0$ and $T(0) = 0$

$$Y_i = (1 - \tau) A_i (L_w + 1)^{\beta_i} - w L_w - G - \underbrace{w_o T(w_o)}_{\geq 0}.$$

Hence $w_o^* = 0$ in the benchmark case, and the choice reduces to

$$\max_{L_w \geq 0} (1 - \tau) A_i (L_w + 1)^{\beta_i} - w L_w - G \quad (5)$$

$$L_w^* + 1 = \begin{cases} \left(\frac{(1-\tau) \beta_i A_i}{w} \right)^{\frac{1}{1-\beta_i}}, & \text{if } w < (1 - \tau) \beta_i A_i \\ 1, & \text{if } w > (1 - \tau) \beta_i A_i \end{cases} \quad (6)$$

$$\Pi_i^* = \begin{cases} = (1 - \tau)(1 - \beta_i)A_i \left(\frac{(1-\tau)\beta_i A_i}{w} \right)^{\frac{\beta_i}{1-\beta_i}} + w - G, & \text{if } w < (1 - \tau)\beta_i A_i \\ (1 - \tau)A_i - G, & \text{if } w > (1 - \tau)\beta_i A_i \end{cases} \quad (7)$$

For the interior solution, the following holds:

$$\underbrace{\frac{wL_w^*}{R_i^*}}_{\text{Factor R}} = (1 - \tau)\beta_i \frac{L_w^*}{L_w^* + 1}.$$

Factor R Case: Non-linear Revenue Tax Rate

Define the payroll-to-revenue ratio **Factor R**:

$$\text{FR}(L_w, w_o) \equiv \frac{wL_w + w_o}{R_i(L_w)} = \frac{wL_w + w_o}{A_i(L_w + 1)^{\beta_i}}. \quad (8)$$

Policy:

$$\tau(\text{FR}) = \begin{cases} \tau_H, & \text{if } \text{FR} < c, \\ \tau_L, & \text{if } \text{FR} \geq c, \end{cases} \quad \text{with } \tau_H > \tau_L, \ c \in (0, 1). \quad (9)$$

The owner's problem is

$$\max_{L_w \geq 0, w_o \geq 0} (1 - \tau(\text{FR})) R_i(L_w) - wL_w - F - w_o T(w_o). \quad (10)$$

We solve these by comparing different solutions

(1) High-tax interior (stay in τ_H)

Impose $w_o = 0$ and solve as in the benchmark with $\tau = \tau_H$:

$$L_H^* + 1 = \begin{cases} \left(\frac{(1-\tau_H)\beta_i A_i}{w} \right)^{\frac{1}{1-\beta_i}}, & \text{if } w < (1 - \tau_H) \beta_i A_i \\ 1, & \text{if } w > (1 - \tau_H) \beta_i A_i \end{cases} \quad (11)$$

Feasibility to *remain* in the high-tax region requires

$$\text{FR}(L_H^*, 0) = \frac{w L_H^*}{A_i (L_H^* + 1)^{\beta_i}} < c. \quad (12)$$

If (12) fails, the optimum cannot be a high-tax interior point.

(2) Low-tax Region: interior (stay in τ_L)

Analogously, impose $w_o = 0$ with $\tau = \tau_L$:

$$L_L^* + 1 = \begin{cases} \left(\frac{(1-\tau_L)\beta_i A_i}{w} \right)^{\frac{1}{1-\beta_i}}, & \text{if } w < (1 - \tau_L) \beta_i A_i \\ 1, & \text{if } w > (1 - \tau_L) \beta_i A_i \end{cases} \quad (13)$$

Feasibility to *remain* in the high-tax region requires

$$\text{FR}(L_L^*, 0) = \frac{w L_L^*}{A_i (L_L^* + 1)^{\beta_i}} \geq c. \quad (14)$$

(3) Threshold/bunching solution (exactly at $\text{FR} = c$). Here the firm “fills the gap” with owner wage to reach the threshold:

$$\text{FR}(L, w_o) = c \quad \Rightarrow \quad w_o(L) = c R(L) - wL \quad (\geq 0). \quad (15)$$

At the threshold the firm enjoys $\tau = \tau_L$. Substituting (15) into (??) (with $\tau = \tau_L$) yields

$$Y(L) = (1 - \tau_L)R(L) - wL - F - \underbrace{w_o(L)T(w_o(L))}_{\text{owner-tax cost}}.$$

The FOC with respect to L uses $w'_o(L) = cR'(L) - w$ and gives

$$(1 - \tau_L)R'(L) - w - \left[T(w_o(L)) + T'(w_o(L))w_o(L) \right] (cR'(L) - w) = 0. \quad (16)$$

A feasible threshold solution requires $w_o(L) \geq 0$, i.e.

$$c R(L) - wL \geq 0. \quad (17)$$

(4) Corner $L_w = 0$. When $w \geq (1 - \tau)\beta_i A_i$ for the relevant regime, $L_w^* = 0$. Two subcases matter:

- ▶ *No shifting*: $w_o^* = 0$, necessarily in the high-tax region (since $\text{FR} = 0 < c$):

$$Y_H^0 = (1 - \tau_H)A_i - F.$$

- ▶ *Shift to the threshold to access τ_L* : choose $w_o = cA_i$ (since $R(0) = A_i$),

$$Y_{\text{thr}}^0 = (1 - \tau_L)A_i - cA_i T(cA_i) - F.$$

The firm prefers to shift if

$$Y_{\text{thr}}^0 > Y_H^0 \iff \tau_H - \tau_L > c T(cA_i). \quad (18)$$

Compute the objective value at all *feasible* candidates:

$\{$ High-tax interior $(L_H^{\text{int}}, w_o = 0)$ $\}$, $\{$ Low-tax interior $(L_L^{\text{int}}, w_o = 0)$ $\}$, $\{$ Threshold $(L^*, w_o(L^*))$ solving

plus corners (including $L_w = 0$ with/without threshold shifting). Pick the maximum. Intuitively, w_o only enters the *numerator* of FR and carries a private cost $w_o T(w_o)$; thus in interior regions $w_o^* = 0$, and positive w_o is only chosen to bunch at the threshold when the tax-gap gain $(\tau_H - \tau_L)$ exceeds the induced owner-tax cost (e.g. condition (18) at $L = 0$).

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Appendix

Tax rates for each Anexo

Table: Anexo I: Commerce

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

Tax rates for each Anexo

Table: Anexo II: Manufacturing

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

Tax rates for each Anexo

Table: 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\$)
1 ^a Faixa	Até 180.000,00	6,00%	–
2 ^a Faixa	De 180.000,01 a 360.000,00	11,20%	9.360,00
3 ^a Faixa	De 360.000,01 a 720.000,00	13,50%	17.640,00
4 ^a Faixa	De 720.000,01 a 1.800.000,00	16,00%	35.640,00
5 ^a Faixa	De 1.800.000,01 a 3.600.000,00	21,00%	125.640,00
6 ^a Faixa	De 3.600.000,01 a 4.800.000,00	33,00%	648.000,00

Tax rates for each Anexo

Table: 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

Tax rates for each Anexo

Table: 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

Before the reform

Table: 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%

Independent of Fator R See

Before the Reform: Anexo V

Anexo V applied to serviços relacionados no **5º-D** do art. 18 desta Lei Complementar

- ▶ These firms were moved to Anexo III
- ▶ They had a tax schedule dependent on a complex Fator R [Back](#)

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) ≥ 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%

Before the reform

Table: 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: Anexo IV post reform

Receita Bruta em 12 Meses (em R\$)	Alíquota
Até 180.000,00	4,50%
De 180.000,01 a 360.000,00	9,00%
De 360.000,01 a 720.000,00	10,20%
De 720.000,01 a 1.800.000,00	14,00%
De 1.800.000,01 a 3.600.000,00	22,00%
De 3.600.000,01 a 4.800.000,00	33,00%

Back

Before the reform

Table: 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%

Before the reform

Table: 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%

Before the reform

Table: 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%

Addressing Tax Inequities in the Service Sector

Simples Nacional taxed firms based on gross revenue.

Less labor-intensive service firms:

- ▶ Example: consultants, lawyers, engineers.
- ▶ High revenue with minimal payroll.
- ▶ Low effective tax burden relative to profit.

More labor-intensive service firms:

- ▶ Example: cleaning services, construction crews.
- ▶ Large share of revenue spent on payroll.
- ▶ Higher effective tax burden under same rate.

Conclusion: Same tax rule created distortions across firms with different cost structures

Why Use Payroll / Revenue Instead of Payroll Growth?

► **Administrative Simplicity & Objectivity:**

- Uses only current-period data — no need to track firm histories.
- Reduces administrative burden, especially for small firms.

► **Avoiding Strategic Timing:**

- Payroll growth-based incentives may induce intertemporal manipulation.
- Ratio-based rules reward sustained behavior (maintaining payroll 28% of revenue).

► **Targeting Labor-Intensive Firms:**

- Goal: favor firms truly reliant on formal labor (e.g., cleaning, construction).
- High payroll/revenue ratio serves as a proxy for labor intensity.

► **Consistency with Simples Nacional Logic:**

- Simples uses gross revenue to define tax brackets.
- Fator R complements this by adjusting tax burden based on how labor-intensive the firm is.

Summary Statistics: Raw Data

Month	202401	202406	202412
Unique Firm ID	5480221	5659363	5857105
Unique Tax Form ID	5480221	5659363	5857105
Anexo_1	0.240	0.239	0.235
Anexo_2	0.034	0.034	0.034
Anexo_3	0.284	0.297	0.302
Anexo_4	0.035	0.036	0.037
Anexo_5	0.082	0.087	0.091
Anexo_NA	0.325	0.307	0.301

Table: Summary Statistics by Year

Summary Statistics: Raw Data

variable	mean	sd	min	max	nobs	nmiss
vl_pgda_decl_rec_bruta_comp	32030	69500	0	68730512	68144911	0
vl_pgda_decl_rec_bruta_caixa	36052	90469	0	22383285	1753895	66391016
vl_pgda_decl_devido	2812	7998	0	7775634	68144911	0
dd_pgda_decl_fator_r	-8	2	-9	99	68144911	0
recsn_rpa_competencia_externo	238	7722	0	9352500	68144911	0
recsn_rpa_competencia_interno	31791	69068	0	68730512	68144911	0
recsn_rbt12_int_proporcional	351735	622990	0	43200000	68144911	0
recsn_rbt12_interno	345738	619409	0.000	10210459	68144911	0
recsn_rbt12_externo	2376	46092	0.000	8602719	68144911	0
fssn_valor	78054	314002	-2093	301435805	5965113	62179798
fator_r_calculado			-Inf	Inf	5910220	62234691
recsn_fator_r	0.469	2.071	0	99.000	5964177	62180734
recsn_rbt12_ext_proporcional	2474	47199	0.000	12000000	68144911	0.000
fssn_nobs	11.032	2.527	1	15	5965113	62179798

Table: Descriptive Statistics of PGDAS Data

Summary Statistics: Raw Data

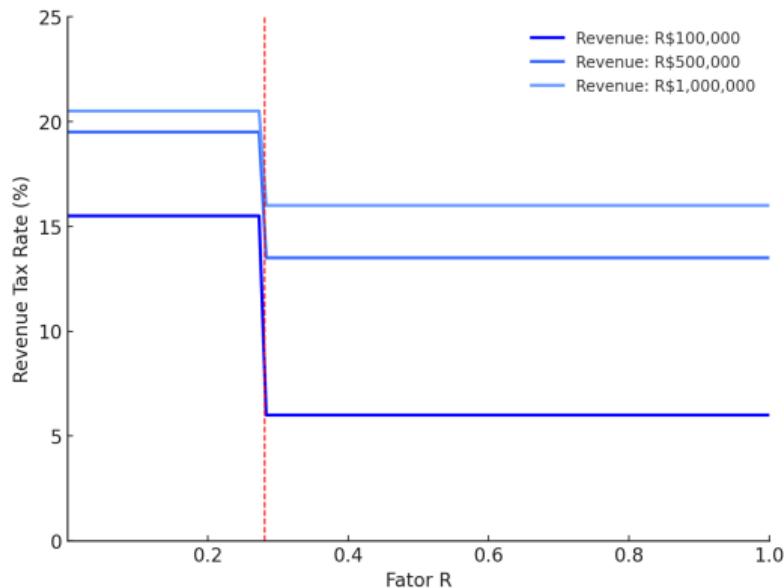
variable	mean	pc25	pc50	pc90	pc99	frac_missing
vl_pgda_decl_rec_bruta_comp	45893.49	27172.33	49632.40	83898.55	99138.87	0.03
vl_pgda_decl_rec_bruta_caixa	48810.27	21041.73	47782.90	89852.30	96912.04	0.03
vl_pgda_decl_devido	2471.17	1123.34	2463.77	4467.20	4963.84	0.01
dd_pgda_decl_fator_r	0.48	0.30	0.48	0.81	0.96	0.07
recsn_rpa_competencia_externo	23972.21	9218.63	25156.09	43766.91	49378.47	0.07
recsn_rpa_competencia_interno	24760.15	10508.93	24276.99	47001.18	49213.24	0.06
recsn_rbt12_int_proporcional	23423.34	8792.58	24773.43	43674.92	48625.61	0.06
recsn_rbt12_interno	25197.76	7268.55	26448.46	46392.20	49277.25	0.04
recsn_rbt12_externo	24455.41	10137.32	20980.93	46993.77	49814.44	0.06
fssn_valor	4638.54	1477.25	4868.75	8782.68	9635.44	0.06
fator_r_calculado	0.76	0.51	1.00	1.00	1.00	0.07
recsn_fator_r	0.49	0.22	0.49	0.93	0.97	0.10
recsn_fsr_acumulado	24477.16	11818.34	24290.63	43465.81	48510.15	0.07
recsn_fsr_proporcional	23162.97	7606.32	23317.58	44792.61	47684.87	0.06
recsn_rbt12_ext_proporcional	23145.50	9363.20	22790.90	44988.35	49171.91	0.00
fssn_nobs	13.31	6.00	13.00	26.00	28.30	0.00

Table: Descriptive Statistics of PGDAS Data Anexo 1

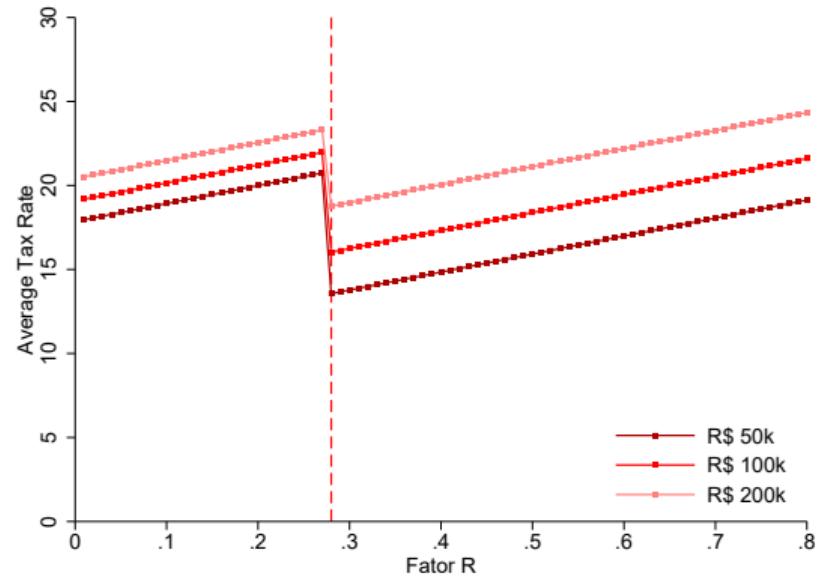


Tax Notch based on Fator R

Average Tax Rate as a function of Fator R



(a) (a) Not including payroll taxes

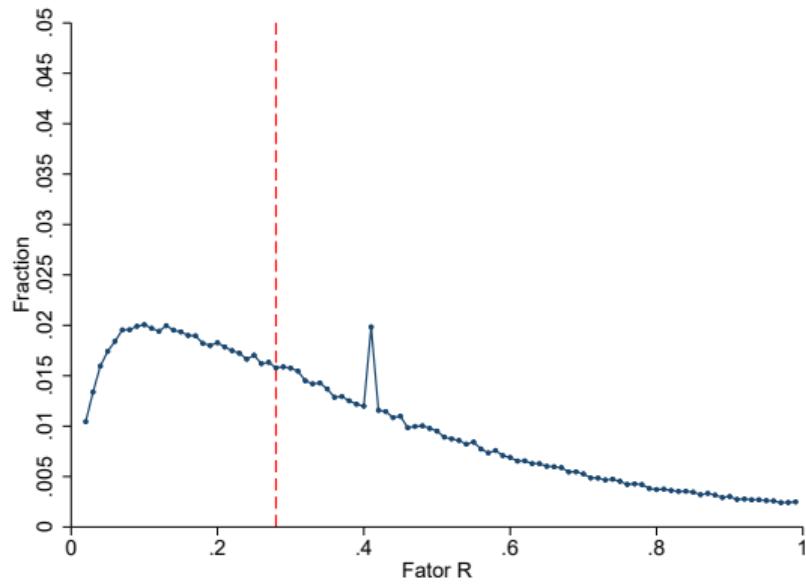
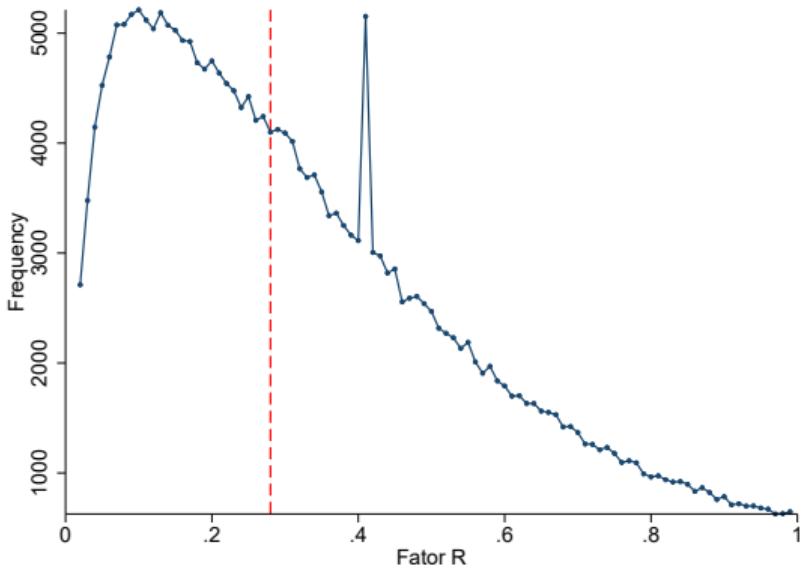


(b) (b) Including payroll taxes

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Pre-reform

Figure: Pre-reform Fator R Distribution (excluding 0 and 1)



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Margins of Response

Factor R: Share of *total payroll* over *total revenues*

① Total payroll

- True: employment creation or higher wages ✓
- Fake: income-shifting (firm owners paying wages themselves) ✓

② Revenues

- True: reduction on investment (capital) → ↓ revenues
- Fake: revenues under-reporting

Preliminary evidence: Small businesses' income-shifting as the main response

Goal: Study in which margins different types of firms respond

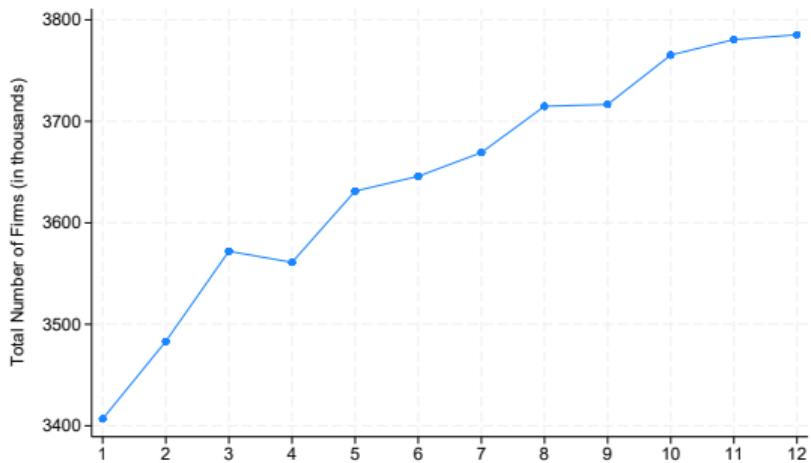
Descriptive Statistics

Firms by Anexo (December 2023)

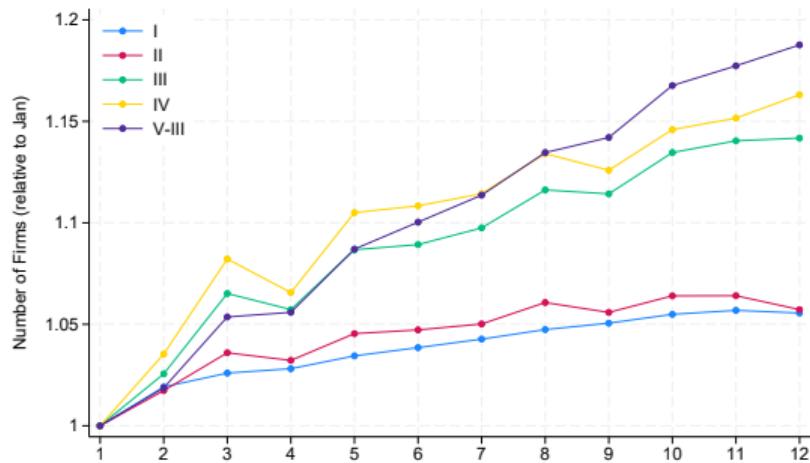
Anexo	N Firms	Share	Revenues	Prolabore	Other Payroll	Employees	Sh. Prolabore
1	1,338,341	0.354	591,435	12,483	110,459	3.20	.49
2	192,724	0.051	861,228	18,602	271,351	7.08	.60
3	1,602,547	0.424	407,743	13,819	120,709	3.03	.49
4	201,348	0.053	528,417	11,267	133,420	3.90	.42
5 (R)	448,293	0.118	267,753	28,530	60,273	1.71	.68

Descriptive Statistics

Number of Firms by Month (2023)



(a) All



(b) By Anexo

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Table: LC 123, art. 18, § 5º-I —Subject to Anexo VI (Pre-reform)

Item	Atividade
I	medicina, inclusive laboratorial e enfermagem
II	medicina veterinária
III	odontologia
IV	psicologia, psicanálise, terapia ocupacional, acupuntura, podologia, fonoaudiologia, clínicas de nutrição e de vacinação e bancos de leite
V	serviços de comissaria, de despachantes, de tradução e de interpretação
VI	arquitetura, engenharia, medição, cartografia, topografia, geologia, geodésia, testes, suporte e análises técnicas e tecnológicas, pesquisa, design, desenho e agronomia
VII	representação comercial e demais atividades de intermediação de negócios e serviços de terceiros
VIII	perícia, leilão e avaliação
IX	auditoria, economia, consultoria, gestão, organização, controle e administração
X	jornalismo e publicidade
XI	agenciamento, exceto de mão de obra
XII	outras atividades do setor de serviços decorrentes do exercício de atividade intelectual, de natureza técnica, científica, desportiva, artística ou cultural, que constitua profissão regulamentada ou não, desde que não sujeitas à tributação na forma dos Anexos III, IV ou V

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Incentives under Factor R

- ▶ Large drop in the revenue tax rate for Factor R > 0.28 (even accounting for SSC and IRPF)
- ▶ Tax notch → drop in the average tax rate between 6 to 9pp

Example for an owner-manager making R\$ 350,000, per year (US\$ 5,630 monthly, top 1%)

- ① All as revenues $\rightarrow 0.18 \times (350k - 180k) + 0.155 \times 180k \rightarrow \text{Av. } \tau = 16.7\%$
- ② 28% as own wages (payroll) = R\$ 98,000
 - $(0.28 \times 350k) \times 0.11 \text{ SSC} + ((0.28 \times 350k) \times 0.89) \times 0.13 \text{ IRPF} = 10.8k + 11.3k = 22.1k$
 - $0.112 \times (350k - 180k) + 0.06 \times 180k = 29.84k \text{ (av. revenue } \tau = 8.5\%)$
 - Total av. tax rate (incl. SSC) $\tau = 15\%$

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Outcome Variables

Outcomes in our setting are non-negative and frequently equal to zero (payroll, prolabore, etc.)

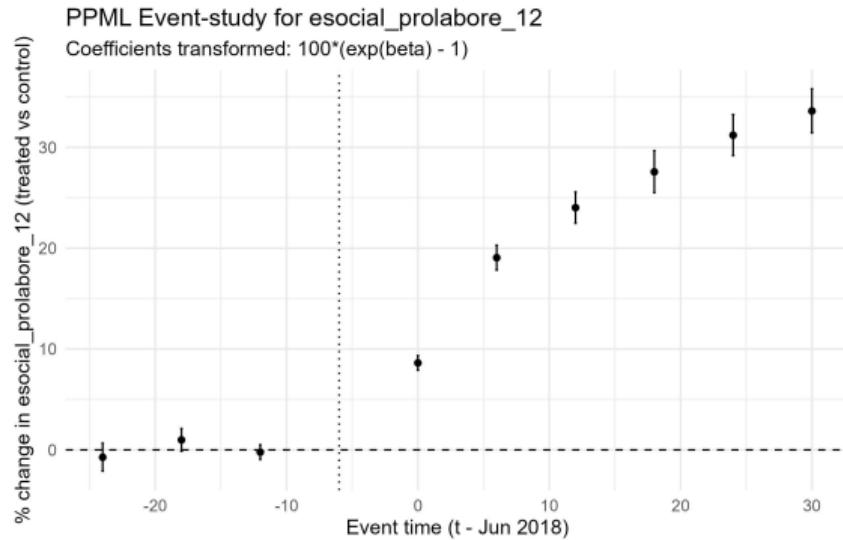
- ▶ Log-linear models drop zeros, which is an important margin of response
- ▶ Log-linear fixes (e.g. $\log(Y + 1)$) are not unit-invariant
- ▶ We use a Poisson Pseudo Maximum Likelihood (PPML)

$$Y_{it} = \alpha_i + \lambda_t + \sum_{k \neq -6} \beta_k \mathbf{1}\{\text{Anexo} = 6\} \cdot \mathbf{1}\{t - 201712 = k\} + \theta' X_i + \varepsilon_{it}, \quad (19)$$

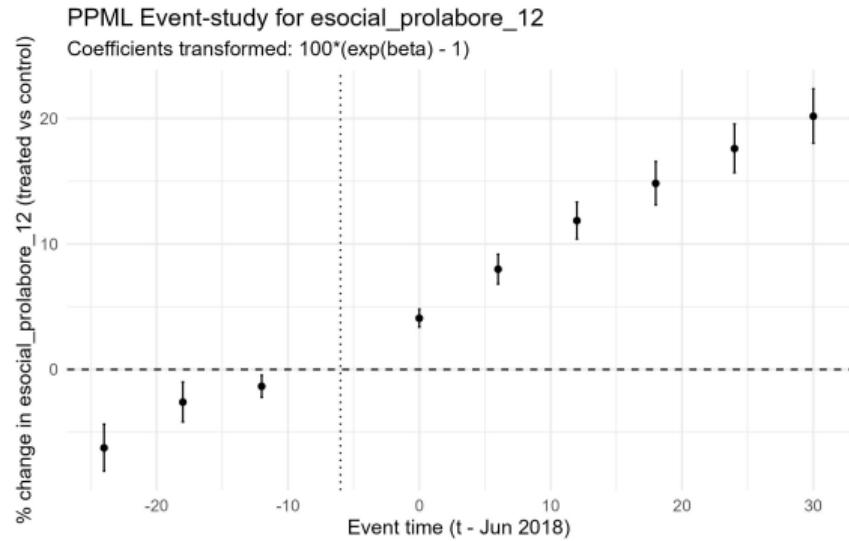
$$\mathbb{E}[Y_{it} \mid D_{i..}, \text{Post}_t, X_i, \alpha_i, \lambda_t] = \exp\left(\alpha_i + \lambda_t + \mathbf{1}\{\text{Anexo} = 6\} \cdot \mathbf{1}\{t > 201712\} + \theta' X_i\right)$$

Prolabore

ITT on Prolabore



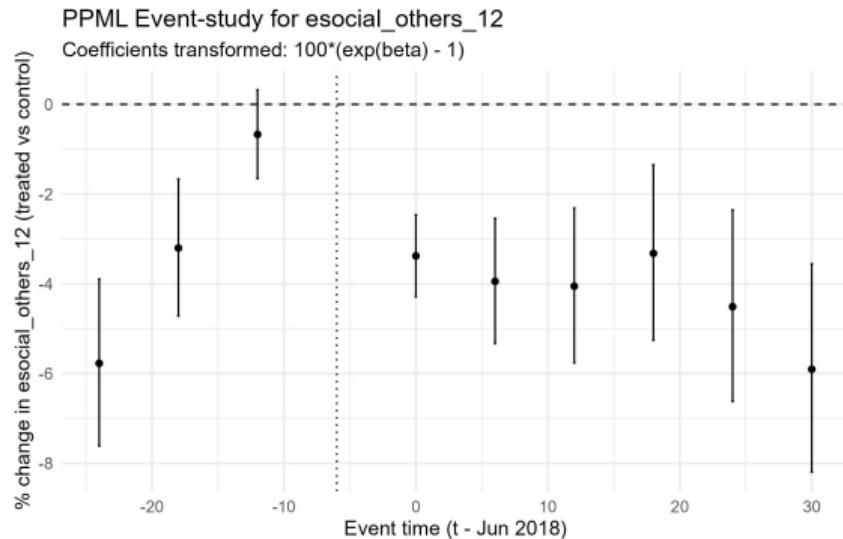
(a) Factor R < 0.28 pre-reform



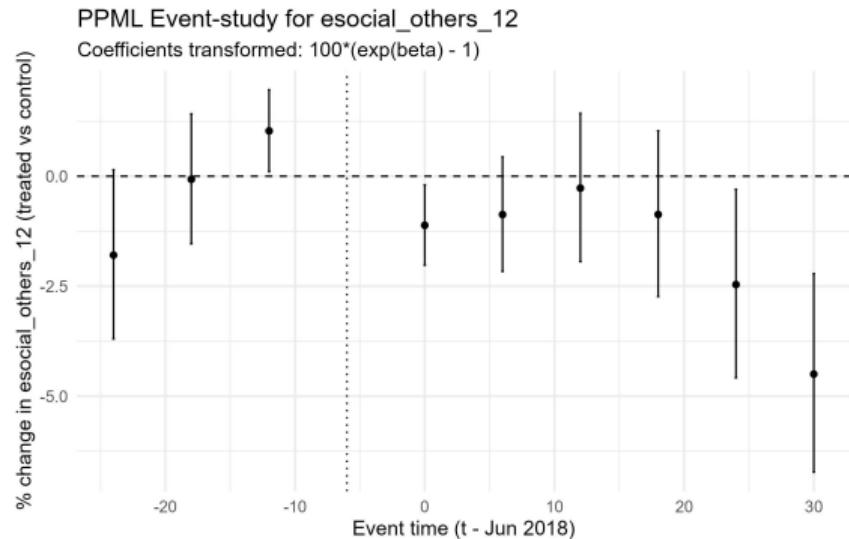
(b) Factor R > 0.28 pre-reform

Other Payroll

ITT on Other Payroll (mostly wages)



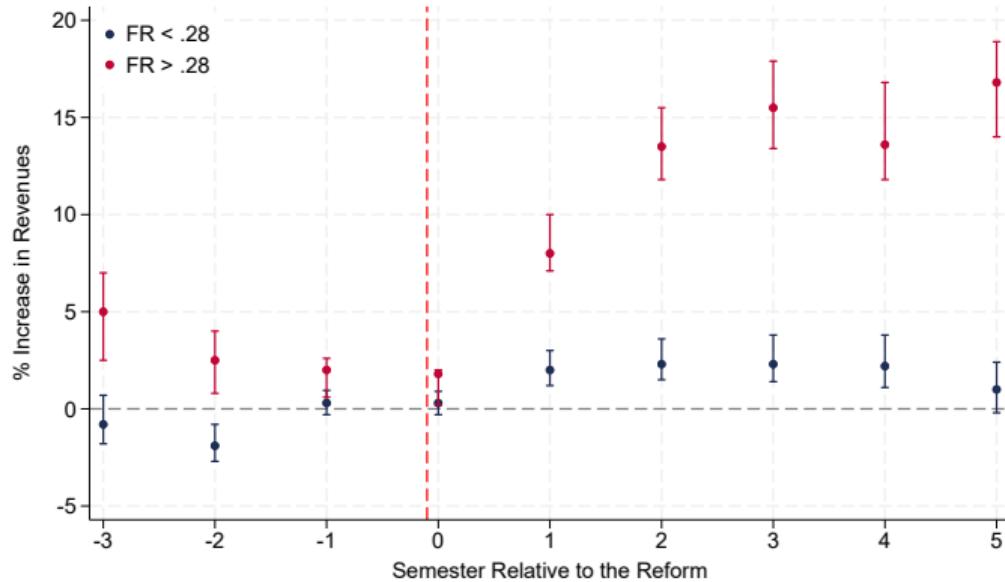
(a) Factor R < 0.28 pre-reform



(b) Factor R > 0.28 pre-reform

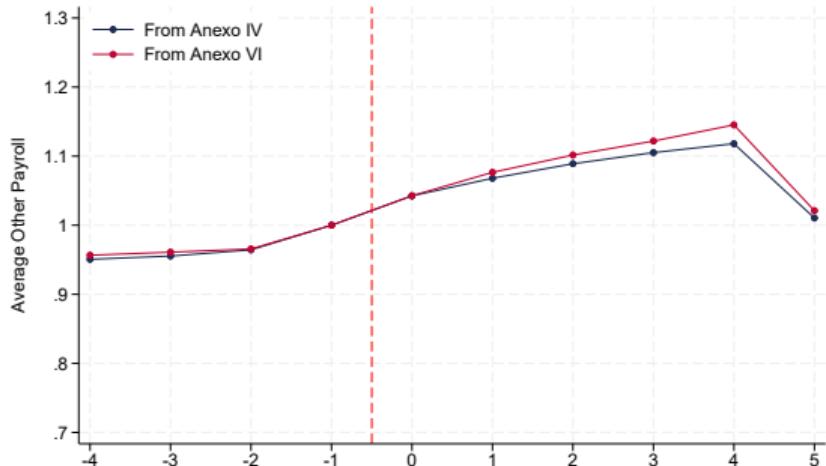
Revenues

ITT on Revenues by Factor R pre-reform

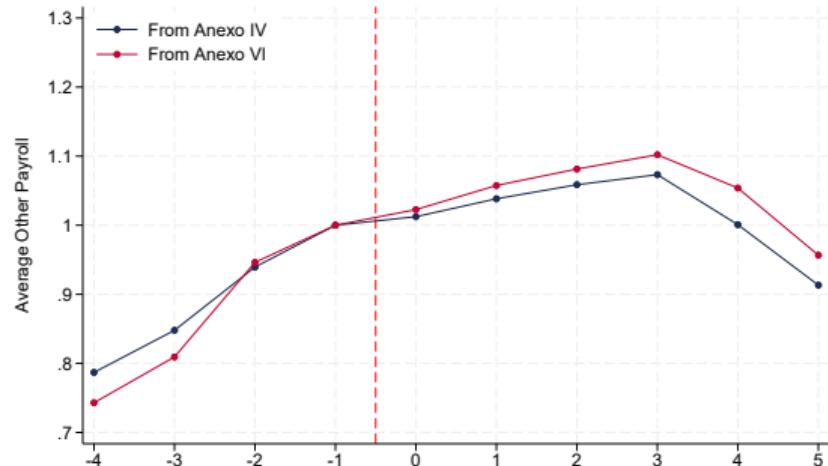


Other Payroll

ITT on Other Payroll (mostly wages)



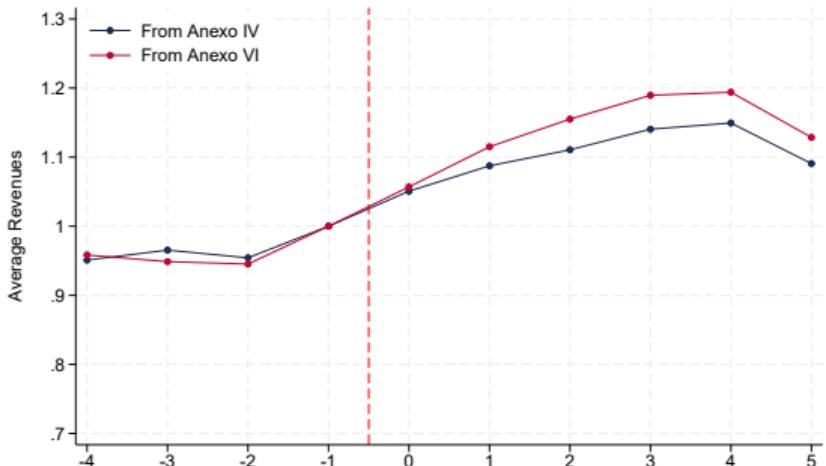
(a) Inputting Missing



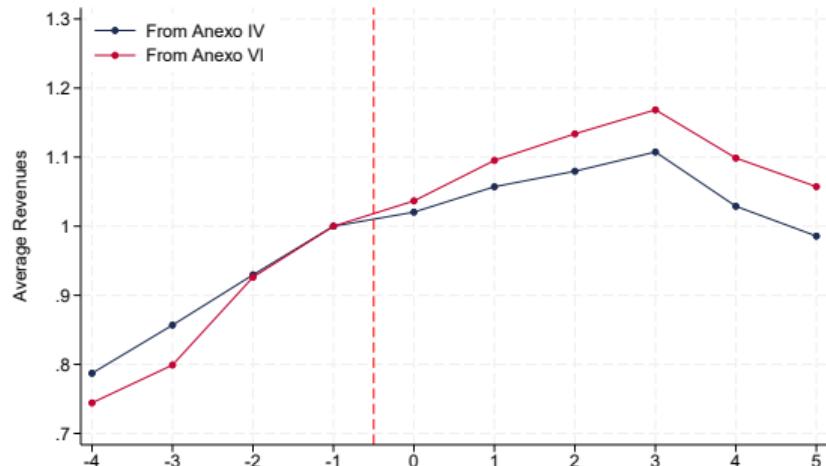
(b) Inputting Zeros

Revenues

ITT on Revenues (mostly wages)



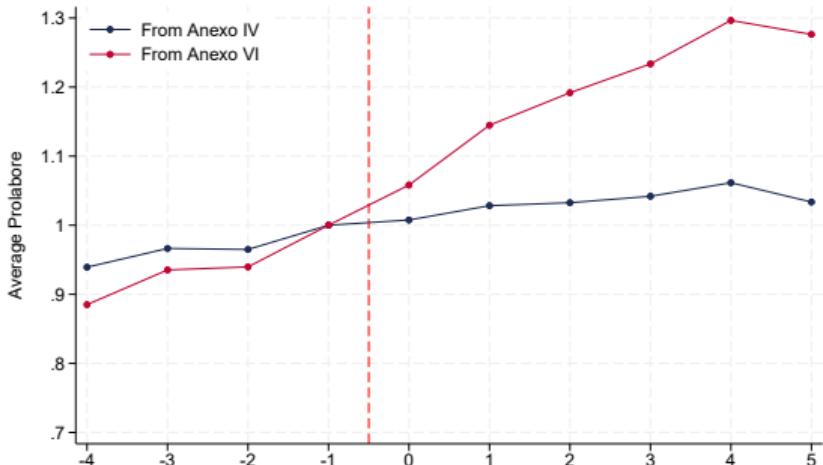
(a) Inputting Missing



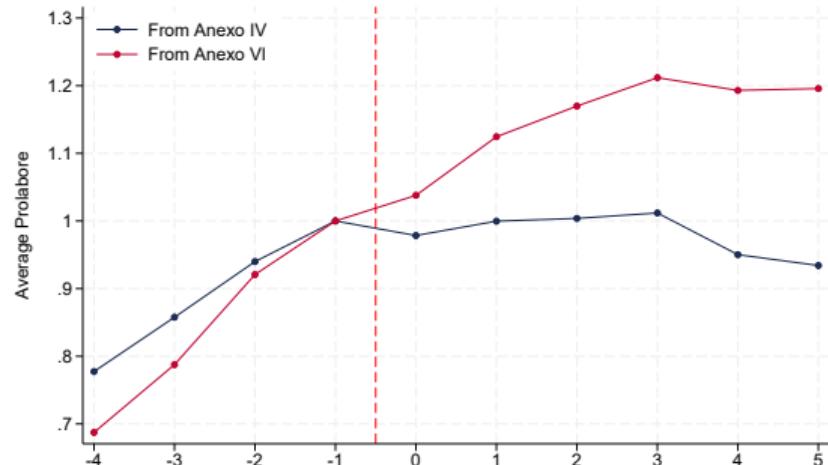
(b) Inputting Zeros

Prolabore

ITT on Prolabore (mostly wages)



(a) Inputting Missing



(b) Inputting Zeros