Simplified Tax Regimes: A Doorway to Tax Evasion

Author

Juan Andres Russy Cervera

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Advisor

Andrea Lopez-Luzuriaga

Department of Economics

Universidad del Rosario

Bogotá, Colombia

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Juan A. Russy [†]

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Abstract

There is limited evidence of the effect of simplified tax regimes on tax evasion. Simplified tax regimes result in firms reporting less information to tax authorities, which lowers the sheltering cost of their revenues. I use a cross-section of firms in Brazil to estimate the relative under-reporting of revenue of a simplified tax regime compared to a presumed profit tax regime. I achieve identification through a matching strategy that leverages Brazil's mandatory electronic billing, which contains third-party reported inter-firm transactions, adjusted by the hassle cost of operating under the presumed profit tax regime. I estimate that firms with similar cost structures and characteristics declare between 48 to 56% less revenue when paying taxes under the simplified tax regime instead of the presumed profit tax regime.

JEL Codes: H26, H30

Keywords: Simplified tax regime, evasion, hassle cost, structural bunching

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[†]Department of Economics, Universidad del Rosario. email: juan.russy@urosario.edu.co

1 Introduction

Simplified tax regimes are prevalent around the world, especially in developing countries. The main objective of these regimes is to reduce the cost for firms to move and remain in the formal sector. The primary strategies to achieve that are to reduce the tax due (*monetary incentives*) and to decrease the hassle cost of taxation (*simplicity incentives*). These regimes are expected to increase the tax base and, consequently, the tax collection. However, the impact of these simplified regimes on fiscal revenue has been understudied. These regimes effectively increase the number of formal firms and jobs (Monteiro and Assunção, 2012), but they could also encourage tax evasion (Aghion et al., 2023).

By construction, simplified regimes require firms to provide very little information, and tax authorities in developing countries cannot enforce correct reporting even if evasion is detected (Carrillo et al., 2023). Two main mechanisms explain why simplified regimes can decrease tax collection: (1) *fiscal minimalism*, firms can stay small to maintain the benefits of simplified tax regimes; (2) *ease of evasion*, firms may choose to remain under simplified tax regimes because it is easier to evade taxes while retaining the benefits of being formal, for example, access to credit and subsidies.

I use a cross-section of firms in Brazil to estimate the relative under-reporting of revenue of a simplified regime compared to a presumed profit regime. Besides the fact that both regimes tax firms based on their revenue, I found considerable differences in reported revenue levels. The regimes differ because extra tax forms must be filled out under the presumed profits tax regime. The additional information requirement increases the hassle cost (i.e., indirect cost of taxation) and sheltering cost (cost to hide revenue from the tax authority). Brazil is well suited to study the effects of simplified tax regimes for various reasons. First, the simplified tax regime started in 1996 (compared with the 1940s for the presumed profit tax regime), which gives us confidence that the firms are well-familiarized with the tax rules. Second, Brazil has implemented mandatory electronic billing since 2005, which contains third-party reported inter-firm transactions. I use electronic billing information to create a proxy of cost

for firms that, for its nature, cannot be manipulated by the firms themselves.

I propose to measure relative evasion with a matching technique using the insights of the Pissarides and Weber (1989) approach that measures tax evasion on income tax by comparing similar households with the same level of food consumption but with sources of income with different degrees of monitoring from the tax authority. Following a similar logic, I want to match firms by their cost structure and characteristics and see differences in reported revenue. This sample of firms should not have legal or economic restrictions to belong to any regime. This means excluding firms that do not satisfy eligibility conditions due to belonging to specific sectors or having legal entities as owners and ruling out those firms that would be informal without the simplified tax regime. I take advantage of the fact that these subgroup of firms choose their tax regime and are small firms that compete in the same economy for clients and suppliers and have access to technology. There are two reasons to choose one of these two regimes: hassle cost and sheltering cost. First, I estimate the hassle cost with a structural bunching estimator. Second. I add the hassle cost to the firms on the simplified tax regime. Finally, I compare the revenues declared by forms of similar characteristics and cost structure on each regime using a matching estimator to calculate a relative reporting gap.

I estimate a structural bunching method (Aghion et al., 2023) to disentangle the hassle cost differential, allowing us to assess the importance of tax simplicity and tax evasion around the threshold. Some firms would decrease their economic activity to stay under the reporting thresholds and stay in the simplified regime, and some would simply declare less revenue. A reduced form bunching estimator (Kleven and Waseem, 2013; Saez, 2010) had been commonly used to estimate the differential of hassle cost. For instance, Harju et al. (2019) found that the hassle cost of declaring VAT in Finland is 5% of sales, and Almunia and Lopez-Rodriguez (2018) found a willingness to pay between 6 and 9% of revenue not to become a large taxpayer unit, which occurs at a revenue of 6 million euros in Spain. However, I must recognize the simultaneous decision between tax simplicity and tax evasion

around the threshold (Aghion et al., 2023). Tax evasion can be used to achieve simplicity by reporting revenue just below the simplified tax regime threshold, and it is easier to evade due to the simplicity of the tax regime.

I use third-party information from the electronic billing system from the suppliers of firms in both tax regimes (simplified and presumed) to construct a cost proxy. The simultaneous decision between tax simplicity and evasion mentioned in the structural bunching could bias my matching results. However, my central insight is that this simultaneous decision is broken far from the threshold. In this case, tax evasion is no longer required to achieve simplicity, even if the simplicity of the tax regime can still facilitate it. This observation allows us to lay outside the structural estimation proposed by Aghion et al. (2023) and achieve identification through a matching technique. I look at the difference in reported revenue between firms in both regimes and find that comparable firms declare between 50 and 55% less revenue when paying taxes under the simplified tax regime instead of the presumed profit tax regime.

I contribute to several different research areas. First, I contribute to the effects of tax simplicity on tax collection and firms' outcomes. Previous studies on the simplified tax regime of Brazil have shown that a simplified tax regime increases the creation of formal firms (Rocha et al., 2018; Monteiro and Assunção, 2012; Piza, 2018); these firms showed higher revenue and profits, employed more workers and more capital (Fajnzylber et al., 2011); and are 30% less likely to close in a given year (Conceição et al., 2018). In my case, I add evidence of considerable tax evasion on the simplified tax regimes relative to presumed profit tax regimes.

Second, I contribute to the literature on evasion identification for simplified tax regimes. I propose a matching technique for which I introduce the relevant assumptions below. My results are in the same ballpark as evasion gaps found in other studies. Al-Karablieh et al. (2021) found that small firms in Greece under-report 40% of their revenue. They rely on random tax audits to obtain results, which can be expensive for institutions in developing countries to implement. The method proposed in this paper can be replicated in most

developing countries with electronic billing information. Aghion et al. (2023) estimate the relative level of evasion of a super simplified and a simplified tax regime for self-employed in France using a structural bunching technique. Their methodology estimates the relative level of evasion around the threshold, while mine complements the estimation in other interval regions.

The paper's structure is as follows: In Section 2, I explain the institutional background of tax regimes in Brazil and the data I use. In Section 3, I explain estimating the hassle costs using a structural bunching method. In Section 4, I describe the matching methodology and results of the relative level of evasion, and in Section 5, I conclude.

2 Institutional Background and Data

Brazil has two main tax regimes for small firms: *Simples Nacional* (Simplified Tax Regime) and *Lucro Presumido* (Presumed Profit Tax Regime). The summary characteristics of both regimes can be seen in Table 1. The annual revenue for the simplified regime is between R$ 0 and R$ 4.8 million and for the presumed profit regime, between R$ 0 and R$ 78 million. The simplified regime has six brackets of annual revenue. The first five brackets, between R$ 0 and R$ 3.6 million, are kink points at which the tax rate slope changes continuously. In the last bracket, between R$ 3.6 and R$ 4.8 million, which I call the *graduation bracket*, simplified tax regime firms must pay two local taxes separately, creating a notch where a discrete jump in bureaucratic costs is observed. In contrast, the presumed profit tax regime is smooth and does not have brackets; the only extra rule to the base tax rates is that all monthly profits over R$ 20,000 suffer an increase of 10 percentage points in corporate income tax.

For three reasons, I focus on firms between R$ 0 and 3.6 million, excluding the *graduation bracket*. First, far fewer firms are in this bracket than the presumed profit regime, as shown in Figure 1. This makes both the simple bunching and structural bunching estimators unstable.

Second, this bracket has average tax rates much more significant than lower brackets and the presumed profit regime, as can be seen in Table 1; this bracket is designed mainly for firms to *graduate* from the simplified regime. Third, this big difference in the tax rate does not allow a confident estimation of the hassle cost for the presumed profit regime around the R$ 4.8 million threshold. The reason is that a more significant tax rate under the notch causes my estimated hassle cost to explode when estimating the structural model (Section 3.2). My results of the revenue gap are robust in including this bracket or not; see Section 4.1.

Under the simplified regime, each bracket and sector has a predetermined tax rate on reported revenue. In contrast, the presumed profit regime calculates the tax rate over the presumed profit given reported revenue and economic activity. The most significant difference is in the hassle costs. The simplified regime has monthly payments for which firms pay eight different taxes completing one document, the *Documento de Arrecadação do Simples Nacional*, better known as DAS, from R$ 0 to R$ 3.6 million. In the graduation bracket, they continue using the DAS to pay six taxes but pay two local taxes separately. The presumed profit regime requires paying each tax individually and in different frequencies, with some taxes monthly, two quarterly, and the other three depending on activity.

The simplified regime excludes specific sectors: finance activities and public defense, health, and education activities. A firm with legal entities as partners or owning a legal entity cannot fall under the simplified regime. I exclude all firms that satisfy these conditions from the analysis.

I construct a cost proxy using third-party information. The firm's costs are calculated using electronic billing. For example, if Firm A sells an input to Firm B, I observed this transaction reported as a sale on the electronic billing system for A, but it is, in fact, a purchase for B, akin to a cost. The third-p arty nature of this information is essential because my identification strategy relies on the fact that firms cannot manipulate these costs.

3 Hassle Cost

My primary interest in estimating the hassle cost is dropping firms on the simplified regime with a profit margin below it. I assume these firms will be informal if the simplified regime does not exist. I compare hassle costs estimated using a simple bunching (Saez, 2010) and a structural bunching estimator (Aghion et al., 2023).

3.1 Simple Bunching Estimation

First, I use a simple bunching estimator to estimate the hassle costs around the kinks: R$ 180k, 360k, 720k, and 1.8 million. As shown in Figure 2, there is no significant bunching around the kinks, which means there is no actual response to a slight change in the tax rate. Most of the effect is explained by the round number effect. Second, I obtain a first estimation of the hassle cost around the R$ 3.6 million notch for the presumed profit regime. Figure **??** shows a bunching at the R$ 3.6 million notches for simplified tax regime firms and a smaller bunching at the R$ 4.8 million notches. I do not observe any bunching for the presumed profit tax regime gross revenue distribution. As mentioned, I only focus on firms between R$ 0 and 3.6 million in revenue, so I am only interested in the former notch.

I obtain the estimation of the marginal buncher position to calculate the hassle cost. I follow Chetty et al. (2011) to estimate Figure 3. To select the excluded range (dashed lines), I followed the Kleven and Waseem (2013) algorithm: the left excluded limit is selected at the bin where the distribution begins to have a positive slope, and the right excluded limit makes the mass between the left excluded limit and the notch equal to the missing mass between the notch and the right excluded limit.

My preferred estimation uses a bin width of 20,000, but the hassle cost estimation is robust to bin width selection, as shown in Figure 4 and Table 2. In my preferred estimation, I estimate the left excluded limit at eight bins below the threshold, which means R$ 3'440,000. The main result is that firms are willing to pay around 2.3-2.4% of their revenue to avoid

filling out tax forms separately under the presumed profit regime. This estimation is probably biased in the context of tax evasion because it fails to recognize the simultaneous decision between tax simplicity and tax evasion around the threshold (Aghion et al., 2023). Tax evasion can be used to achieve simplicity by reporting revenue just below the simplified tax regime threshold, and it is easier to evade due to the simplicity of the tax regime. Therefore, I need to use a structural model to separate both effects.

3.2 Structural Bunching

My structural estimation represents a streamlined adaptation of the methodology proposed by Aghion et al. (2023), designed to disentangle the effects of tax regime simplicity from those of tax evasion. In my model firms can select between the simplified tax regime (applicable for revenues below R$ 3.6M) and the presumed profit tax regime ($i = s, l$). The firm's objective is to maximize the following utility function:

$$\max u_i(y_i, \tilde{y}_i) = y_i(1 - c_i) - T_i(\tilde{y}_i) - a_i - h(y_i, \theta) - g(y_i, \tilde{y}_i) \tag{1}$$

In this equation, y_i represents the actual revenue, $\tilde{y}_i$ denotes the reported revenue, and c_i corresponds to the costs (thus, $y_i(1 - c_i)$ reflects the operational revenue). The parameters include the hassle cost, a_i, and the firm's productivity, θ. The hassle cost is assumed to decrease with the simplicity of the tax regime. The model incorporates three functions: $T(\tilde{y}_i)$, representing the tax liability based on reported revenue; $h(y_i, \theta)$, representing the dis-utility a firm with productivity θ experiences in generating revenue y_i; and $g(y_i, \tilde{y}_i)$, representing the misreporting cost, which increases with y_i and decreases with $\tilde{y}_i$. Consistent with existing literature, I employ the following functional forms:

$$h(y_i; \theta) = \frac{\theta}{1 + \frac{1}{\epsilon}} \left(\frac{y_i}{\theta}\right)^{1+\frac{1}{\epsilon}} \qquad g(y_i, \tilde{y}_i) = \frac{1}{1 + \frac{1}{\eta}} (y_i - \tilde{y}_i)^{1+\frac{1}{\eta}} \tag{2}$$

Where ϵ is the actual revenue elasticity and η is the evasion elasticity. As noted in Table

1, the effective rates of each of the tax regimes are as follows: in the simplified regime, τ_s is levied on gross (reported) revenues $\tilde{y}_s$, and in the presumed profit regime, τ_l is levied on presumed profit $(1-\mu)\tilde{y}_l$.

3.2.1 Responses

Since I am interested in the relative level of evasion between the simplified regime and presumed profit regime, it is fair to assume that presumed profit regime firms do not misreport any revenue, $y_l = \tilde{y}_l$, and the misreporting cost is zero $g_l(.) = 0$. Without the notch for the simplified tax regimes:

$$\frac{\partial u_s}{\partial y_s} \to (1-c_s) - \left(\frac{y_s}{\theta}\right)^{\frac{1}{\epsilon}} - (y_s - \tilde{y}_s)^{\frac{1}{\eta}} = 0 \qquad \frac{\partial u_s}{\partial \tilde{y}_s} \to -\tau_s + (y_s - \tilde{y}_s)^{\frac{1}{\eta}} = 0 \tag{3}$$

Which solving for y_s and $\tilde{y}_s$:

$$y_s = \theta[1 - c_s - \tau_s]^{\epsilon} \qquad \tilde{y}_s = \theta[1 - c_s - \tau_s]^{\epsilon} - \tau_s^{\eta} \tag{4}$$

When the notch is included, I assume the existence of a marginal agent who reports revenues exactly at the threshold y^* but would have reported revenues at $y^* + \Delta y^*$ absent the notch. If unconstrained by the notch:

$$y^* + \Delta y^* = (\theta^* + \Delta\theta^*)[1 - c_s - \tau_s]^{\epsilon} - \tau_s^{\eta} \tag{5}$$

$$y_s = (\theta^* + \Delta\theta^*)[1 - c_s - z_s]^{\epsilon} \tag{6}$$

With the notch, the reported revenues are y^*, and the actual revenues are y_s^*. Which satisfy:

$$\max_{y_s^*} u_s(y_s^*; y^*)$$

$$\frac{\partial u_s}{y_s^*} \to (1 - c_s) - \left(\frac{y_s^*}{\theta^* + \Delta\theta^*}\right)^{\frac{1}{\epsilon}} - (y_s^* - y^*)^{\frac{1}{\eta}} = 0 \tag{7}$$

Denoting y_l^I as the indifference point in the presumed profit regime where $u_s(y_s^*, y^*) = u_l(y_l^I, y_l^I)$. In other words, the point where the firm is indifferent between no misreporting in the presumed profit regime and misreporting in y^* in a simplified regime. Since $y_l^I = \tilde{y}_l^I$ is interior:

$$y_l^I = \tilde{y}_l^I = (\theta^* + \Delta\theta^*)[1 - c_l - (1 - \mu)\tau_l]^\epsilon \tag{8}$$

Following Aghion et al. (2023), to reduce the dimensions of the problem, I assume three things: (1) Real response to tax rates tends to zero, $\epsilon \to 0$, as noted in Figure 2, there is no significant bunching around the kinks; (2) $c_s = c_l = c$, which means that firms in no regime have a competitive advantage in productivity, this assumption is also crucial later in my matching estimation; (3) Average tax rate is locally uniform between the simpler regimes and the standard regime, this allows us to use a homogeneous tax rate for each regime separately.

From (7):

$$\theta^* + \Delta\theta^* = y_s^*[1 - c_s - (y_s^* - y^*)^{\frac{1}{\eta}}]^{-\epsilon} \to y_s^* \tag{9}$$

From (5):

$$y^* + \Delta y^* = (\theta^* + \Delta\theta^*)[1 - c_s - \tau_s]^\epsilon - \tau_s^\eta \to y^* + \Delta y^* = y_s^* - \tau_s^\eta \tag{10}$$

From (8):

$$y_l^I = \tilde{y}_l^I = (\theta^* + \Delta\theta^*)[1 - c_l - (1-\mu)\tau_l]^\epsilon \to y_s^* \tag{11}$$

Since $u_s(y_s^*, y^*) = u_l(y_l^I, y_l^I)$ and $c_s = c_l = c$, the system simplifies to one equation:

$$[\tau_s y^* - \tau_l(1-\mu)y_s^*] + \frac{(y_s^* - y^*)^{1+\frac{1}{\eta}}}{1+\frac{1}{\eta}} - \Delta a_s = 0 \tag{12}$$

3.2.2 Estimation

I need to identify two parameters (Δa_s, η): the differential hassle cost between the simplified and presumed profit regimes and the evasion elasticity that I assume is homogeneous across activities. For that, I am going to use two data moments dividing firms by *business-to-business* (B2B) and *business-to-consumers* (B2C). The division I make is by annex in the simplified tax regime; to see the details, please go to Appendix A. I obtained the data by empirical marginal buncher $\hat{\Delta} y_s^*$ for the two types of activity; see Appendix B. Then, I try to find the parameters that best adjust the model, minimizing the loss function concerning a model-predicted marginal buncher $\Delta y_s^*(\Delta a_s, \eta)$:

$$L(\Delta a_s, \eta) = g[\hat{\Delta} y_s^*, \Delta y_s^*(\Delta a_s, \eta)]' \; W \; g[\hat{\Delta} y_s^*, \Delta y_s^*(\Delta a_s, \eta)] \tag{13}$$

where $g(.)$ is a vector of difference between the empirical and model-predicted moments, and W is a diagonal weighting matrix containing the empirical moments' inverse.

3.2.3 Results of Structural Bunching

Table 3 shows the estimation result. I found an evasion elasticity below one at 0.82. The estimated value of simplicity (Δa_s) is around ten times higher than the one estimated using the simple bunching estimator in Section 3.1. It represents 26 % of the revenue at the R$ 3.6 million threshold. **?** found that hassle cost represents around 22 % of the revenue around the threshold for the Services and Non Commercial activities concerning a standard tax regime.

4 Relative Level of Evasion

I keep the firms that can fall under either of the regimes. I exclude presumed profit tax regime firms with legal entities as partners, those who own a legal entity, or those in the financial, public defense, health, and education sectors. I exclude firms with profit margins below the hassle cost estimated in Section 3.2 from the simplified tax regime. I assume these firms would be in the informal sector if the simplified regime did not exist.

In my main specification, I set the upper limit of revenues when the distribution began to have a positive slope to avoid the simultaneous decision between tax simplicity and evasion. In other words, I exclude firms with revenues above the left excluded limit in the Simple Bunching Estimation at R$ 3'440,000 (see Section 3.1). I do robustness checks varying this upper limit. After constructing this sample, I matched simplified and presumed profit tax regime firms based on cost structure and firm characteristics. I compare the reported revenue level between matched firms to try to identify the relative level of evasion among simplified tax regime firms. The main assumptions of my identification strategy are the following:

1. *Unobservables do not influence the choice between the presumed profit and the simplified tax regime beyond evasion opportunities.* I try to satisfy this assumption by cleaning and controlling all covariates that might affect the choice between regimes.

2. *Reported revenue differences arise because firms in the presumed profit regime have fewer misreporting opportunities than the simplified regime.* This implies firms in no regime have a competitive advantage in productivity and have similar cost structures as assumed in Section 3.2.

Table 4 presents the distribution of firms for the main specification; there are nearly 1.7 million firms by regime, with the simplified tax regime encompassing 90% of the total and the presumed profit tax regime accounting for 10%. The analysis indicates that firms across both regimes exhibit similar firm tenure. However, on average, entities operating under the presumed profit tax regime employ more individuals. Additionally, firms associated with

the simplified tax regime are characterized by lower bank credits, debits, and card payment transactions. Notably, despite incurring fewer expenses, firms under the presumed profit tax regime report higher gross revenues on average.

My specification for comparing differences in gross revenue is:

$$\ln y_i = \beta_0 + \beta_1 S_i + \beta_2 C_i + \gamma X_i + \delta(S_i \times C_i) + Z(S_i \times X_i) + \epsilon_i \tag{14}$$

where y_i is the gross revenue of firm i, S_i equals one if the firm belongs to the simplified tax regime and zero for the presumed profit regime, C_i is the cost of firm i, and X_i are the rest of the firm characteristics.

I compute the average treatment effect of belonging to the simplified tax regime as follows:

$$E\left[\ln y_i | S = 1, C, X\right] - \left[\ln y_i | S = 0, C, X\right] \tag{15}$$

I try four different matching methodologies: (a) Nearest neighbor with Propensity Score estimated with Logistic Regression, (b) Coarsened Exact Matching (CEM), (c) Generalized Full Matching, and (d) Nearest Neighbor with Propensity Score estimated with Random Forest. I restrict he match to the sector variable, to be exact. As can be seen in Figure 5, for the sample of firms with gross revenue below $3'440.000$, only (c) and (d) achieve a good balance and will be the ones for which I am going to present my main results.

I show the results in Table 5. Columns (1) and (2), my main specifications, estimate the percentage change in the gross revenue under-reported by simplified regime firms to be between 48 and 56%. With Assumption 1, I assume that is the proportion of the simplified regime's evaded revenue concerning the presumed profit regime.

4.1 Robustness

I estimate two specifications with Generalized Full Matching, changing the upper limit to $3'600.000$ and $4'800.000$. Results are shown in columns (3) and (4) of Table 5 and similar

results are obtained. Due to its more formal environment, belonging to a presumed profit tax regime could increase overall business productivity. For robustness, I control for two specific productivity measures. First, employee efficiency is the ratio between the number of employees and the business's total costs. Second, compensation efficiency is equivalent to the ratio between employee remuneration and overall costs. The results with this correction can be seen in columns (5) and (6) of Table 5. Results for the Generalized Full Matching specification in column (5) change in four decimals concerning column (1).

5 Conclusion

I have explored the fiscal effects of the simplified tax regime in Brazil. The hassle cost of belonging to the presumed profit tax regime is around 26 % of the revenue. Using third-party electronic billing as the primary matching variable, I have extended the Pissarides and Weber (1989) approach to measure tax evasion between tax regimes in firms. The lower information requirement in simplified tax regimes allows the firms to hide an essential part of their revenue. My results are consistent with findings in other papers that use random tax audits to measure revenue under-reporting in Greece for small firms (Al-Karablieh et al., 2021). However, more research is required to measure the effectiveness of this method. The ideal way to measure this method's effectiveness would be to compare simultaneously implemented random tax audits and the matching method. If results continue to be similar, this opens a methodology that tax authorities can use to approximate tax evasion with available data.

References

P. Aghion, U. Akcigit, M. Gravoueille, M. Lequien, and S. Stantcheva. Tax simplicity or simplicity of evasion? evidence from self-employment taxes in france. Working Paper, 2023.

Y. Al-Karablieh, E. Koumanakos, and S. Stantcheva. Clearing the bar: Improving tax compliance for small firms through target setting. Journal of International Economics, 130:103452, May 2021. ISSN 0022-1996. doi: 10.1016/j.jinteco.2021.103452. URL https://www.sciencedirect.com/science/article/pii/S0022199621000295.

M. Almunia and D. Lopez-Rodriguez. Under the Radar: The Effects of Monitoring Firms on Tax Compliance. American Economic Journal: Economic Policy, 10(1):1–38, Feb. 2018. ISSN 1945-7731. doi: 10.1257/pol.20160229. URL https://www.aeaweb.org/articles?id=10.1257/pol.20160229.

P. Carrillo, D. Donaldson, D. Pomeranz, and M. Singhal. Ghosting the Tax Authority: Fake Firms and Tax Fraud in Ecuador. American Economic Review, 2023. URL https://www.aeaweb.org/articles?id=10.1257/aeri.20220321.

R. Chetty, J. N. Friedman, T. Olsen, and L. Pistaferri. Adjustment costs, firm responses, and micro vs. macro labor supply elasticities: Evidence from danish tax records. The Quarterly Journal of Economics, 126(2):749–804, 2011.

O. C. Conceição, M. V. Saraiva, A. Fochezatto, and M. T. Aniceto França. Brazil's Simplified Tax Regime and the longevity of Brazilian manufacturing companies: A survival analysis based on RAIS microdata. EconomiA, 19(2):164–186, May 2018. ISSN 1517-7580. doi: 10.1016/j.econ.2017.10.003. URL https://www.sciencedirect.com/science/article/pii/S151775801730022X.

P. Fajnzylber, W. F. Maloney, and G. V. Montes-Rojas. Does formality improve micro-firm performance? Evidence from the Brazilian SIMPLES program. Journal of Development Economics, 94(2):262–276, 2011. ISSN 0304-3878. doi: 10.1016/j.jdeveco.2010.01.009. URL https://www.sciencedirect.com/science/article/pii/S0304387810000118.

J. Harju, T. Matikka, and T. Rauhanen. Compliance costs vs. tax incentives: Why do entrepreneurs respond to size-based regulations? Journal of Public Economics, 173:139–

164, May 2019. ISSN 0047-2727. doi: 10.1016/j.jpubeco.2019.02.003. URL https://www.sciencedirect.com/science/article/pii/S0047272719300210.

H. J. Kleven and M. Waseem. Using notches to uncover optimization frictions and structural elasticities: Theory and evidence from pakistan. The Quarterly Journal of Economics, 128 (2):669–723, 2013.

J. C. M. Monteiro and J. J. Assunção. Coming out of the shadows? Estimating the impact of bureaucracy simplification and tax cut on formality in Brazilian microenterprises. Journal of Development Economics, 99(1):105–115, Sept. 2012. ISSN 0304-3878. doi: 10.1016/j.jdeveco.2011.10.002. URL https://www.sciencedirect.com/science/article/pii/S0304387811001052.

C. A. Pissarides and G. Weber. An expenditure-based estimate of britain's black economy. Journal of public economics, 39(1):17–32, 1989.

C. Piza. Out of the Shadows? Revisiting the impact of the Brazilian SIMPLES program on firms' formalization rates. Journal of Development Economics, 134:125–132, Sept. 2018. ISSN 0304-3878. doi: 10.1016/j.jdeveco.2018.05.002. URL https://www.sciencedirect.com/science/article/pii/S0304387818304589.

R. Rocha, G. Ulyssea, and L. Rachter. Do lower taxes reduce informality? evidence from brazil. Journal of Development Economics, 134:28–49, 2018. ISSN 0304-3878. doi: https://doi.org/10.1016/j.jdeveco.2018.04.003. URL https://www.sciencedirect.com/science/article/pii/S0304387818303560.

E. Saez. Do taxpayers bunch at kink points? American Economic Journal: Economic Policy, 2(3):180–212, August 2010. doi: 10.1257/pol.2.3.180. URL https://www.aeaweb.org/articles?id=10.1257/pol.2.3.180.

Tables

Table 1: Characteristics of the Simples Nacional and Lucro Presumido tax regimes

	Simplified Regime	**Presumed Profit Regime**
Annual Revenue Limits	R$ 0 - 4.8 million	R$ 0 - 78 million
Tax Brackets	**Brackets (by Annual Revenue):** 1. R$ 0 to 18 k 2. R$ 180 to 60k 3. R$ 360 to 20k 4. R$ 720 to 1.8M 5. R$ 1.8M to 3.6M 6. R$ 3.6M to 4.8M **(Graduation)**	No brackets; the only modification is a 10 percentage point increase in tax income after profit over R$ 20k per month
Tax base	Predetermined tax rate for each bracket and annex (sector) on reported revenue $\tilde{y}$	Tax rate over presumed profit rate on reported revenue $\tilde{y}$
Hassle Cost	Monthly payments. **From R$ 0 to 3.6M**: One document (DAS) to pay eight taxes **From R$ 3.6M to 4.8M**: Pays 6 taxes with DAS and pay two local taxes separately	**Monthly:** Three taxes in separate payments. **Quarterly:** Two taxes in separate payments. The other three taxes depend mainly on activity.
Average Tax Rate	Weighted by number of firms per annex 1. R$ 0 to 18 k: 5.3 % 2. R$ 180 to 60k: 8.8 % 3. R$ 360 to 20k: 10.5 % 4. R$ 720 to .8M: 11.7 % 5. R$ 1.8M to 3.6M (B2C): 15.5 % (B2B): 14.7 % 6. R$ 3.6M to 4.8M (B2C): 24.3 % (B2B): 32.3 %	Effective tax rate (presumed profit included) Above R$ 3.6M: 18.04 %

Table 2: Summary Hassle Costs by Bin Width

Bin width	Hassle Cost at 3.6 M	Hassle Cost at 3.6 M (%)
12,000	85,993	2.39%
15,000	86,822	2.41%
20,000	83,745	2.33%

Table 3: Structural Parameter Estimates

Parameter	Description	Estimation
η	Elasticity of evasion	0.82
Δa_s	Difference in hassle cost between presumed profit and simplified regime	943,497.2

Table 4: Descriptive Statistics by Type

	Simples Nacional			Lucro Presumido		
Variable	Mean	SD	Median	Mean	SD	Median
Age	14.2	10.1	11.0	15.6	10.0	13.0
Num. of Employees	5.8	9.4	3.1	13.7	41.3	4.0
Cost	148,156.3	271,673.3	38,053.8	53,018.6	140,850.5	5,676.6
Bank Credits	1'034,317.9	2'706,387.1	451,315.4	4'587,299.6	26'840,112.0	988,423.1
Bank Debits	1'045,610.4	3'436,974.6	452,549.8	4'696,138.0	29'214,604.8	991,515.1
Card Payments	5,074.4	45,365.8	0.0	16,752.4	162,571.9	0.0
Remuneration	120,928.7	215,541.8	54,027.4	298,409.7	1'045,890.7	47,160.0
Gross Revenue	500,546.4	637,379.1	249,373.0	1'011.409.7	938,539.2	687,781.0
Number of firms		1'539.267			164,222	

Descriptive statistics by type for the main specification. The Upper gross revenue limit is R$ 3,440,000, and firms with a profit margin below the hassle cost are dropped.

Table 5: Results Main Specification

	(1)	(2)	(3)	(4)	(5)	(6)
ATT	-0.671	-0.818	-0.687	-0.686	-0.671	-0.872
	(0.0083)	(0.0067)	(0.0081)	(0.0079)	(0.0083)	(0.0053)
Control	12.4	12.1	12.4	12.4	12.4	12.1
	(0.0031)	(0.0029)	(0.0031)	(0.0032)	(0.0031)	(0.0029)
% Change ($e^{ATT} - 1$)	-48.9 %	-55.9 %	-49.7 %	-49.6 %	-48.9 %	-58.2 %
Observations	1'703,043	272,336	1'713,002	1'724,035	1'703,043	267,402
Common Support		Yes				Yes
Productivity Controls	No	No	No	No	Yes	Yes
Upper Revenue Limit	3′440.000	3′440.000	3′600.000	4′800.000	3′440.000	3′440.000

Main Specification results. Each column represents a different matching algorithm: (1) Generalized Full Matching with a revenue limit of 3′440.000, (2) Nearest Neighbor with Propensity Score estimated with Random Forest with a revenue limit of 3′440.000, (3) Generalized Full Matching with a revenue limit of 3′600.000, (4) Generalized Full Matching with a revenue limit of 4′800.000, (5) Generalized Full Matching with productivity controls and a revenue limit of 3′440.000, (6) Nearest Neighbor with Propensity Score estimated with Random Forest with productivity controls and a revenue limit of 3′440.000. All matching algorithms except genetic matching have an exact matching on the firms' sector.

Figures

Figure 1: Distribution of Gross Revenue by Tax Regime

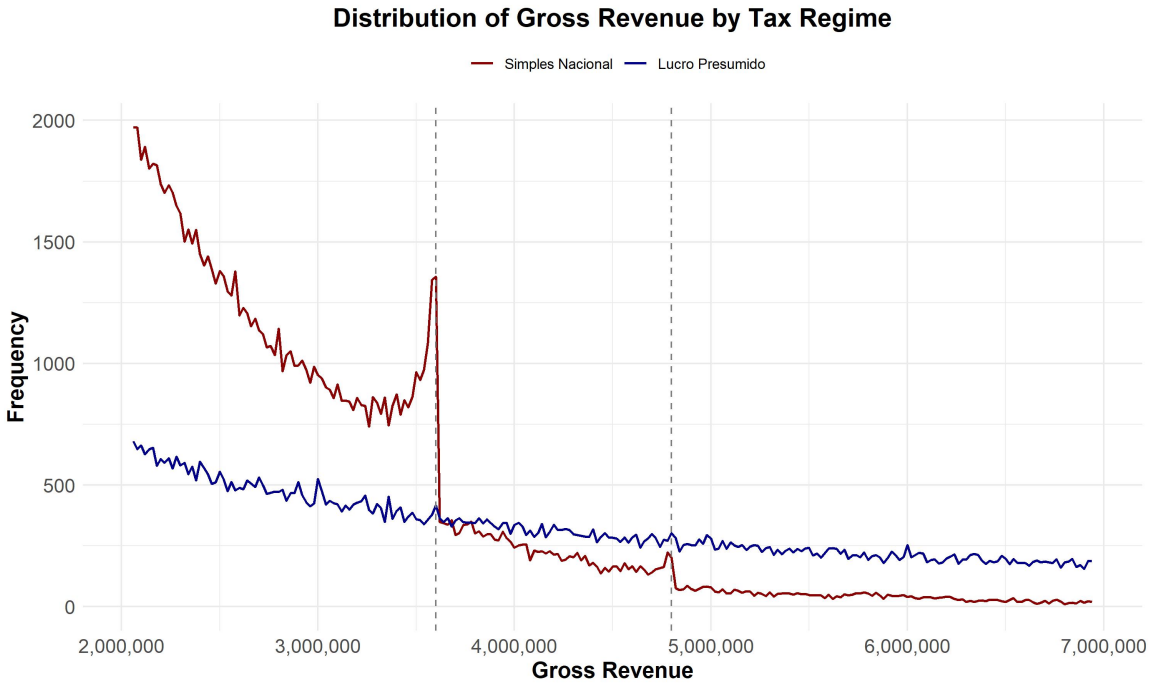
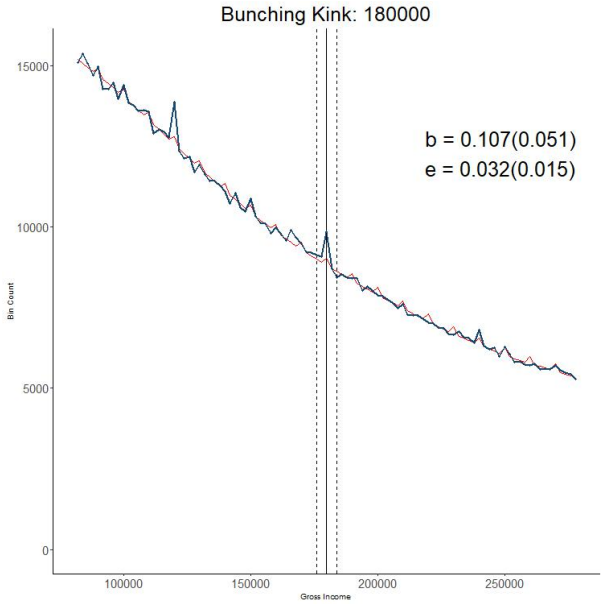
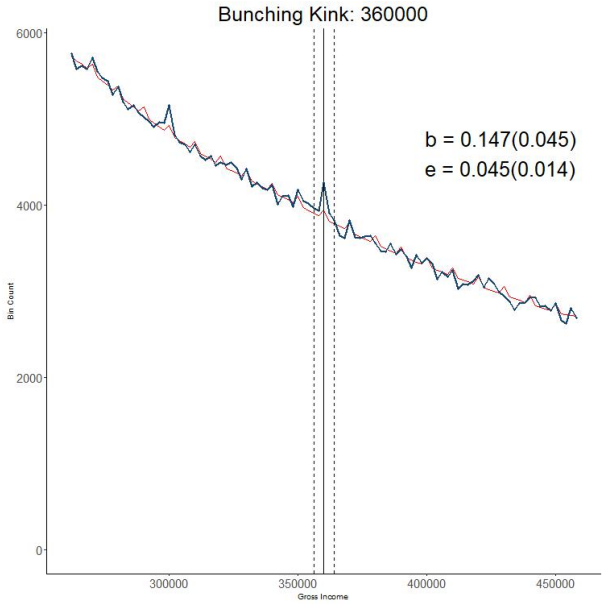


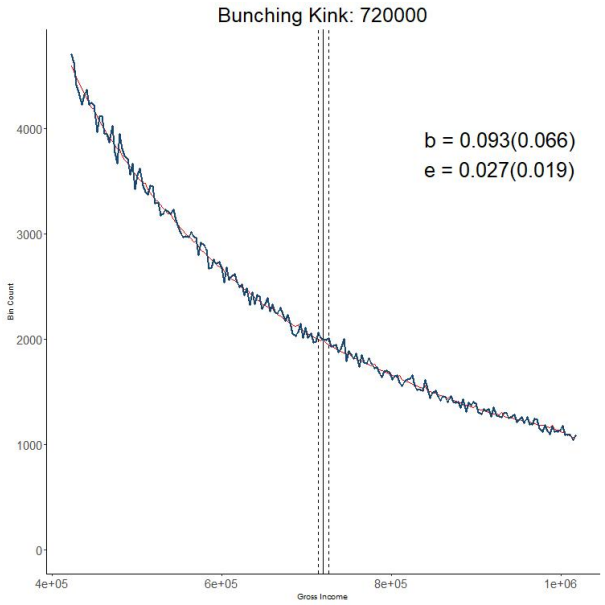
Figure 2: Bunching Estimation At Kinks R$ 180k, 360k, 720k and 1.8 million on Simplified Regime



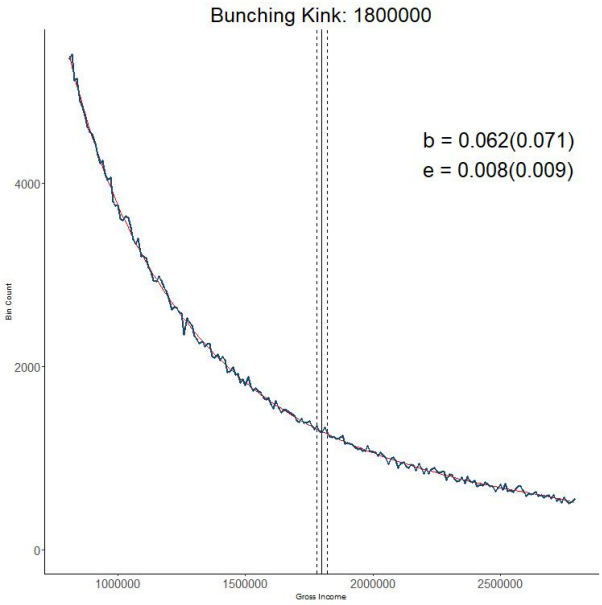
(a) Kink: R$ 180,000, Bin width: 2,000



(b) Kink: R$ 360,000, Bin width: 2,000

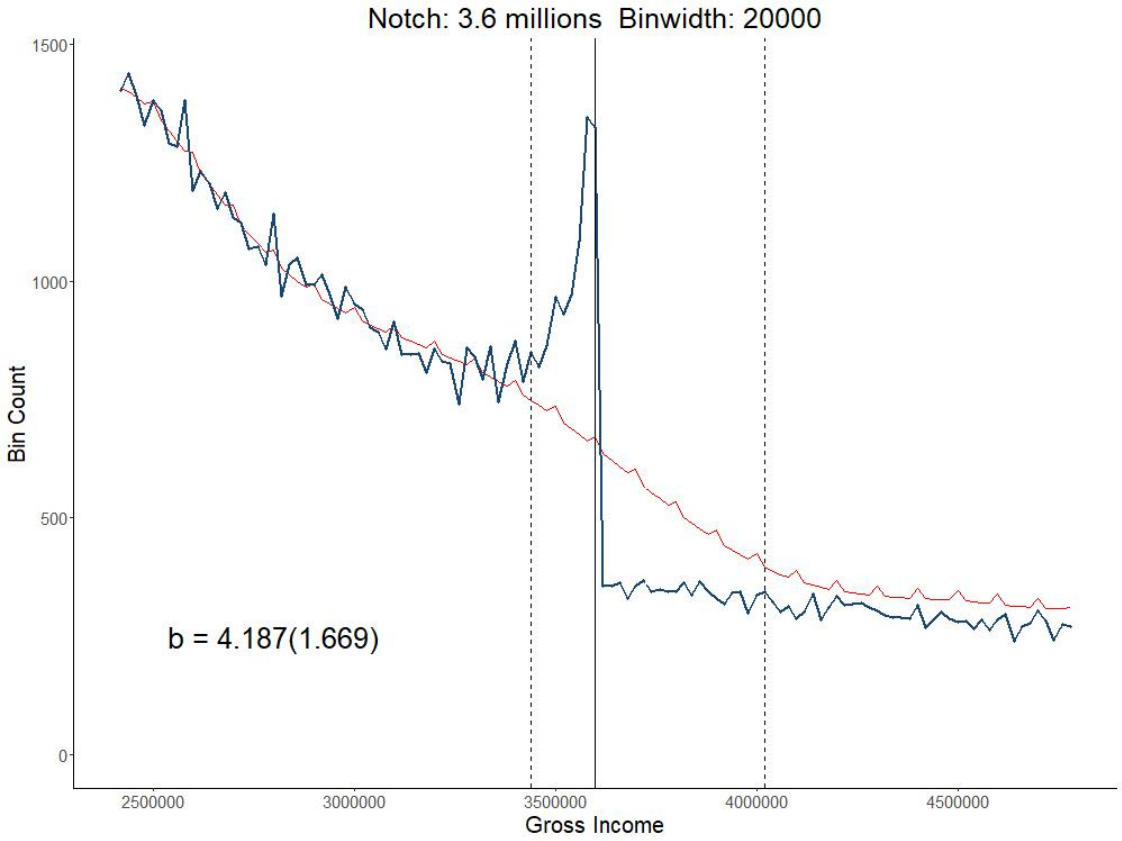


(c) Kink: R$ 720,000, Bin width: 3,000



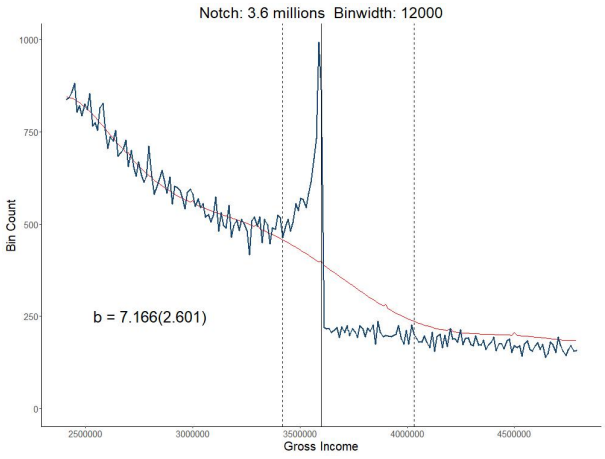
(d) Kink: R$ 1'800,000, Bin width: 10,000

Figure 3: Bunching estimation at notch R$ 3.6 million

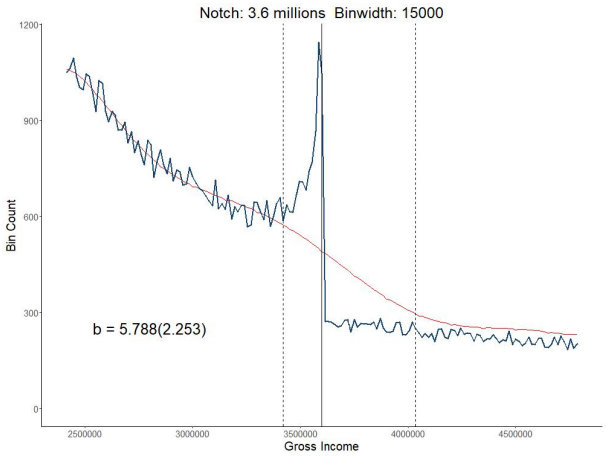


(a) Notch: R$ 3.6 million, Bin width: 20,000

Figure 4: Robustness bunching estimation at notch R$ 3.6 million varying bin width

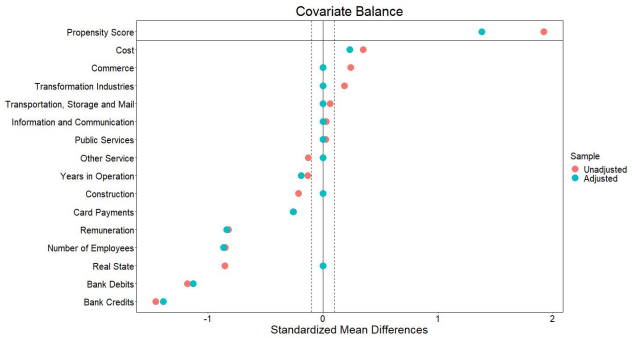


(a) Notch: R$ 3.6 million, Bin width: 12,000

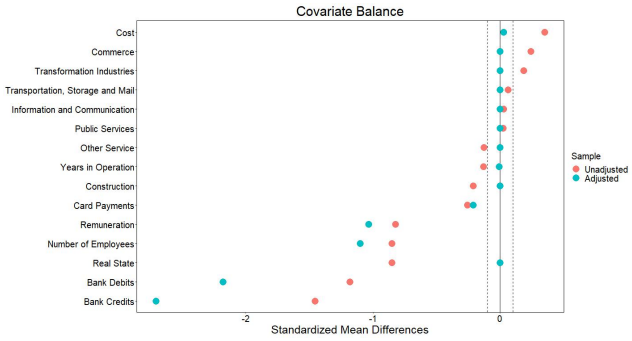


(b) Notch: R$ 3.6 million, Bin width: 15,000

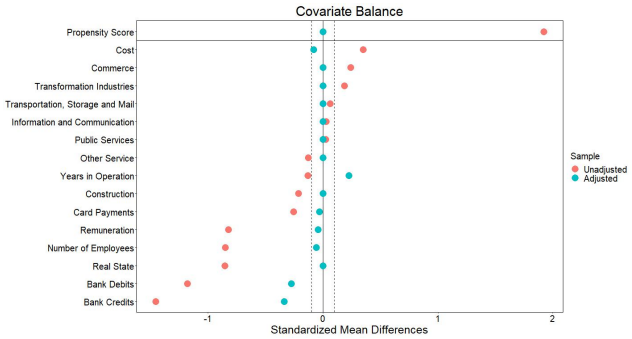
Figure 5: Balance after matching. The match on sectors was exact on all the algorithms used



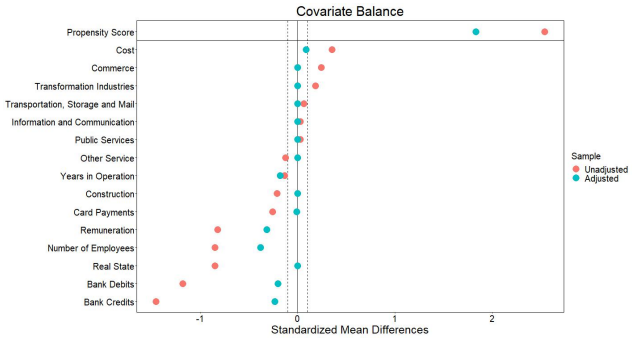
(a) Nearest Neighbor with Propensity Score estimated with Logistic Regression



(b) CEM



(c) Generalized Full Matching



(d) Nearest Neighbor with Propensity Score estimated with Random Forest

Note: Matching is done for firms with a margin of profit higher than the hassle cost and gross revenue below 3′440.000 at the start of the bunching region.

A Detail B2B and B2C Classification

The division that I make is by annexing the simplified tax regime. The simplif ed tax regime in Brazil has five annexes:

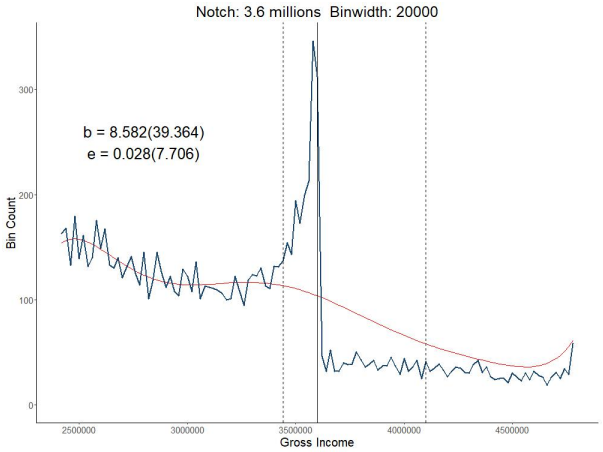
1. Participants: commercial companies (general stores)
2. Participants: factories/industries and industrial companies
3. Participants: companies that offer installation, repair, and maintenance services. This annex includes travel agencies, accounting offices, gyms, laboratories, and medical and dental companies.
4. Participants: companies that provide cleaning, security, construction, real estate construction, legal services
5. Participants: companies that offer auditing, journalism, technology, advertising, engineering services, among others

I include Annex 2 in the B2B classification and Annex 1, 3, 4, and 5 in the B2C classification, leaving 199,829 firms in the B2B classification and 2,619,379 firms in the B2C classification.

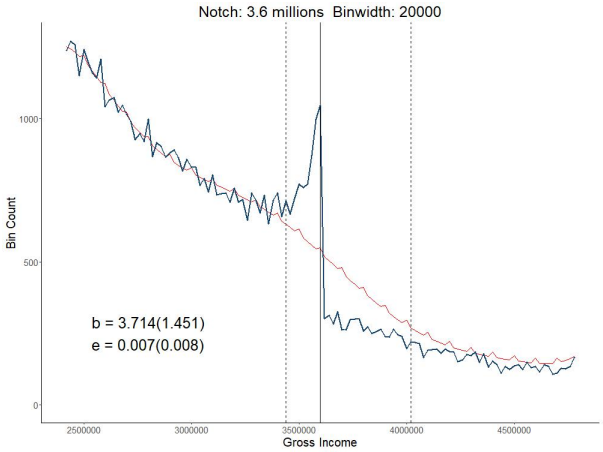
B Empirical Data Moments

Empirical Data Moments can be seen in Figure A.1. I estimate a marginal buncher of 171,640 for the B2B firms and a marginal buncher of 74,820 for the B2C firms.

Figure A.1: Empirical Data Moments



(a) Marginal Buncher for the *business to business* (B2B) activity firms



(b) Marginal Buncher for the *business to consumer* (B2C) activity firms